PUBLIC ADMINISTRATION AND PUBLIC POLICY/155

HANDBOOK OF PUBLIC INFORMATION SYSTEMS

THIRD EDITION

Edited by
CHRISTOPHER M. SHEA
G. DAVID GARSON

CRC Press
Taylor & Francis Group

HANDBOOK OF PUBLIC INFORMATION SYSTEMS

THIRD EDITION

Edited by
CHRISTOPHER M. SHEA
G. DAVID GARSON

CRC Press
Taylor & Francis Group
Boca Raton London New York

CRC Press is an imprint of the
Taylor & Francis Group, an **informa** business

PUBLIC ADMINISTRATION AND PUBLIC POLICY

A Comprehensive Publication Program

1. *Public Administration as a Developing Discipline,* Robert T. Golembiewski
2. *Comparative National Policies on Health Care,* Milton I. Roemer, M.D.
3. *Exclusionary Injustice: The Problem of Illegally Obtained Evidence,* Steven R. Schlesinger
5. *Organization Development in Public Administration,* edited by Robert T. Golembiewski and William B. Eddy
7. *Approaches to Planned Change,* Robert T. Golembiewski
8. *Program Evaluation at HEW,* edited by James G. Abert
9. *The States and the Metropolis,* Patricia S. Florestano and Vincent L. Marando
11. *Changing Bureaucracies: Understanding the Organization before Selecting the Approach,* William A. Medina
12. *Handbook on Public Budgeting and Financial Management,* edited by Jack Rabin and Thomas D. Lynch
15. *Handbook on Public Personnel Administration and Labor Relations,* edited by Jack Rabin, Thomas Vocino, W. Bartley Hildreth, and Gerald J. Miller
19. *Handbook of Organization Management,* edited by William B. Eddy
22. *Politics and Administration: Woodrow Wilson and American Public Administration,* edited by Jack Rabin and James S. Bowman
23. *Making and Managing Policy: Formulation, Analysis, Evaluation,* edited by G. Ronald Gilbert
25. *Decision Making in the Public Sector,* edited by Lloyd G. Nigro
26. *Managing Administration,* edited by Jack Rabin, Samuel Humes, and Brian S. Morgan
27. *Public Personnel Update,* edited by Michael Cohen and Robert T. Golembiewski
28. *State and Local Government Administration,* edited by Jack Rabin and Don Dodd
29. *Public Administration: A Bibliographic Guide to the Literature,* Howard E. McCurdy
31. *Handbook of Information Resource Management,* edited by Jack Rabin and Edward M. Jackowski
32. *Public Administration in Developed Democracies: A Comparative Study,* edited by Donald C. Rowat
33. *The Politics of Terrorism: Third Edition,* edited by Michael Stohl
34. *Handbook on Human Services Administration,* edited by Jack Rabin and Marcia B. Steinhauer
36. *Ethics for Bureaucrats: An Essay on Law and Values, Second Edition,* John A. Rohr
37. *The Guide to the Foundations of Public Administration,* Daniel W. Martin
39. *Terrorism and Emergency Management: Policy and Administration,* William L. Waugh, Jr.

40. *Organizational Behavior and Public Management: Second Edition,* Michael L. Vasu, Debra W. Stewart, and G. David Garson
43. *Government Financial Management Theory,* Gerald J. Miller
46. *Handbook of Public Budgeting*, edited by Jack Rabin
49. *Handbook of Court Administration and Management*, edited by Steven W. Hays and Cole Blease Graham, Jr.
50. *Handbook of Comparative Public Budgeting and Financial Management*, edited by Thomas D. Lynch and Lawrence L. Martin
53. *Encyclopedia of Policy Studies: Second Edition,* edited by Stuart S. Nagel
54. *Handbook of Regulation and Administrative Law,* edited by David H. Rosenbloom and Richard D. Schwartz
55. *Handbook of Bureaucracy,* edited by Ali Farazmand
56. *Handbook of Public Sector Labor Relations*, edited by Jack Rabin, Thomas Vocino, W. Bartley Hildreth, and Gerald J. Miller
57. *Practical Public Management*, Robert T. Golembiewski
58. *Handbook of Public Personnel Administration*, edited by Jack Rabin, Thomas Vocino, W. Bartley Hildreth, and Gerald J. Miller
60. *Handbook of Debt Management*, edited by Gerald J. Miller
61. *Public Administration and Law: Second Edition*, David H. Rosenbloom and Rosemary O'Leary
62. *Handbook of Local Government Administration*, edited by John J. Gargan
63. *Handbook of Administrative Communication*, edited by James L. Garnett and Alexander Kouzmin
64. *Public Budgeting and Finance: Fourth Edition,* edited by Robert T. Golembiewski and Jack Rabin
67. *Handbook of Public Finance*, edited by Fred Thompson and Mark T. Green
68. *Organizational Behavior and Public Management: Third Edition,* Michael L. Vasu, Debra W. Stewart, and G. David Garson
69. *Handbook of Economic Development*, edited by Kuotsai Tom Liou
70. *Handbook of Health Administration and Policy*, edited by Anne Osborne Kilpatrick and James A. Johnson
72. *Handbook on Taxation*, edited by W. Bartley Hildreth and James A. Richardson
73. *Handbook of Comparative Public Administration in the Asia-Pacific Basin*, edited by Hoi-kwok Wong and Hon S. Chan
74. *Handbook of Global Environmental Policy and Administration,* edited by Dennis L. Soden and Brent S. Steel
75. *Handbook of State Government Administration,* edited by John J. Gargan
76. *Handbook of Global Legal Policy,* edited by Stuart S. Nagel
78. *Handbook of Global Economic Policy,* edited by Stuart S. Nagel
79. *Handbook of Strategic Management: Second Edition,* edited by Jack Rabin, Gerald J. Miller, and W. Bartley Hildreth
80. *Handbook of Global International Policy,* edited by Stuart S. Nagel
81. *Handbook of Organizational Consultation: Second Edition,* edited by Robert T. Golembiewski
82. *Handbook of Global Political Policy,* edited by Stuart S. Nagel
83. *Handbook of Global Technology Policy,* edited by Stuart S. Nagel
84. *Handbook of Criminal Justice Administration*, edited by M. A. DuPont-Morales, Michael K. Hooper, and Judy H. Schmidt
85. *Labor Relations in the Public Sector: Third Edition*, edited by Richard C. Kearney
86. *Handbook of Administrative Ethics: Second Edition,* edited by Terry L. Cooper
87. *Handbook of Organizational Behavior: Second Edition*, edited by Robert T. Golembiewski
88. *Handbook of Global Social Policy,* edited by Stuart S. Nagel and Amy Robb
89. *Public Administration: A Comparative Perspective, Sixth Edition,* Ferrel Heady

90. *Handbook of Public Quality Management*, edited by Ronald J. Stupak and Peter M. Leitner
91. *Handbook of Public Management Practice and Reform*, edited by Kuotsai Tom Liou
93. *Handbook of Crisis and Emergency Management*, edited by Ali Farazmand
94. *Handbook of Comparative and Development Public Administration: Second Edition,* edited by Ali Farazmand
95. *Financial Planning and Management in Public Organizations*, Alan Walter Steiss and Emeka O. Cyprian Nwagwu
96. *Handbook of International Health Care Systems,* edited by Khi V. Thai, Edward T. Wimberley, and Sharon M. McManus
97. *Handbook of Monetary Policy,* edited by Jack Rabin and Glenn L. Stevens
98. *Handbook of Fiscal Policy,* edited by Jack Rabin and Glenn L. Stevens
99. *Public Administration: An Interdisciplinary Critical Analysis,* edited by Eran Vigoda
100. *Ironies in Organizational Development: Second Edition, Revised and Expanded,* edited by Robert T. Golembiewski
101. *Science and Technology of Terrorism and Counterterrorism*, edited by Tushar K. Ghosh, Mark A. Prelas, Dabir S. Viswanath, and Sudarshan K. Loyalka
102. *Strategic Management for Public and Nonprofit Organizations*, Alan Walter Steiss
103. *Case Studies in Public Budgeting and Financial Management: Second Edition,* edited by Aman Khan and W. Bartley Hildreth
104. *Handbook of Conflict Management,* edited by William J. Pammer, Jr. and Jerri Killian
105. *Chaos Organization and Disaster Management,* Alan Kirschenbaum
106. *Handbook of Gay, Lesbian, Bisexual, and Transgender Administration and Policy,* edited by Wallace Swan
107. *Public Productivity Handbook: Second Edition,* edited by Marc Holzer
108. *Handbook of Developmental Policy Studies,* edited by Gedeon M. Mudacumura, Desta Mebratu and M. Shamsul Haque
109. *Bioterrorism in Medical and Healthcare Administration,* Laure Paquette
110. *International Public Policy and Management: Policy Learning Beyond Regional, Cultural, and Political Boundaries,* edited by David Levi-Faur and Eran Vigoda-Gadot
111. *Handbook of Public Information Systems, Second Edition,* edited by G. David Garson
112. *Handbook of Public Sector Economics,* edited by Donijo Robbins
113. *Handbook of Public Administration and Policy in the European Union,* edited by M. Peter van der Hoek
114. *Nonproliferation Issues for Weapons of Mass Destruction,* Mark A. Prelas and Michael S. Peck
115. *Common Ground, Common Future: Moral Agency in Public Administration, Professions, and Citizenship*, Charles Garofalo and Dean Geuras
116. *Handbook of Organization Theory and Management: The Philosophical Approach, Second Edition,* edited by Thomas D. Lynch and Peter L. Cruise
117. *International Development Governance,* edited by Ahmed Shafiqul Huque and Habib Zafarullah
118. *Sustainable Development Policy and Administration,* edited by Gedeon M. Mudacumura, Desta Mebratu, and M. Shamsul Haque
119. *Public Financial Management,* edited by Howard A. Frank
120. *Handbook of Juvenile Justice: Theory and Practice,* edited by Barbara Sims and Pamela Preston
121. *Emerging Infectious Diseases and the Threat to Occupational Health in the U.S. and Canada,* edited by William Charney
122. *Handbook of Technology Management in Public Administration,* edited by David Greisler and Ronald J. Stupak
123. *Handbook of Decision Making,* edited by Göktuğ Morçöl
124. *Handbook of Public Administration, Third Edition,* edited by Jack Rabin, W. Bartley Hildreth, and Gerald J. Miller
125. *Handbook of Public Policy Analysis,* edited by Frank Fischer, Gerald J. Miller, and Mara S. Sidney

126. *Elements of Effective Governance: Measurement, Accountability and Participation,* edited by Kathe Callahan
127. *American Public Service: Radical Reform and the Merit System,* edited by James S. Bowman and Jonathan P. West
128. *Handbook of Transportation Policy and Administration,* edited by Jeremy Plant
129. *The Art and Practice of Court Administration,* Alexander B. Aikman
130. *Handbook of Globalization, Governance, and Public Administration,* edited by Ali Farazmand and Jack Pinkowski
131. *Handbook of Globalization and the Environment,* edited by Khi V. Thai, Dianne Rahm, and Jerrell D. Coggburn
132. *Personnel Management in Government: Politics and Process, Sixth Edition,* Norma M. Riccucci and Katherine C. Naff
133. *Handbook of Police Administration,* edited by Jim Ruiz and Don Hummer
134. *Handbook of Research Methods in Public Administration, Second Edition,* edited by Kaifeng Yang and Gerald J. Miller
135. *Social and Economic Control of Alcohol: The 21st Amendment in the 21st Century,* edited by Carole L. Jurkiewicz and Murphy J. Painter
136. *Government Public Relations: A Reader,* edited by Mordecai Lee
137. *Handbook of Military Administration,* edited by Jeffrey A. Weber and Johan Eliasson
138. *Disaster Management Handbook,* edited by Jack Pinkowski
139. *Homeland Security Handbook,* edited by Jack Pinkowski
140. *Health Capital and Sustainable Socioeconomic Development,* edited by Patricia A. Cholewka and Mitra M. Motlagh
141. *Handbook of Administrative Reform: An International Perspective,* edited by Jerri Killian and Niklas Eklund
142. *Government Budget Forecasting: Theory and Practice,* edited by Jinping Sun and Thomas D. Lynch
143. *Handbook of Long-Term Care Administration and Policy,* edited by Cynthia Massie Mara and Laura Katz Olson
144. *Handbook of Employee Benefits and Administration,* edited by Christopher G. Reddick and Jerrell D. Coggburn
145. *Business Improvement Districts: Research, Theories, and Controversies,* edited by Göktuğ Morçöl, Lorlene Hoyt, Jack W. Meek, and Ulf Zimmermann
146. *International Handbook of Public Procurement,* edited by Khi V. Thai
147. *State and Local Pension Fund Management,* Jun Peng
148. *Contracting for Services in State and Local Government Agencies,* William Sims Curry
149. *Understanding Research Methods: A Guide for the Public and Nonprofit Manager,* Donijo Robbins
150. *Labor Relations in the Public Sector, Fourth Edition,* Richard Kearney
151. *Performance-Based Management Systems: Effective Implementation and Maintenance,* Patria de Lancer Julnes
152. *Handbook of Governmental Accounting,* edited by Frederic B. Bogui
153. *Bureaucracy and Administration,* edited by Ali Farazmand
154. *Science and Technology of Terrorism and Counterterrorism, Second Edition,* edited by Tushar K. Ghosh, Mark A. Prelas, Dabir S. Viswanath, and Sudarshan K. Loyalka
155. *Handbook of Public Information Systems, Third Edition,* edited by Christopher M. Shea and G. David Garson

Available Electronically

Principles and Practices of Public Administration, edited by Jack Rabin, Robert F. Munzenrider, and Sherrie M. Bartell

PublicADMINISTRATION*netBASE*

CRC Press
Taylor & Francis Group
6000 Broken Sound Parkway NW, Suite 300
Boca Raton, FL 33487-2742

Printed in the United States of America on acid-free paper
10 9 8 7 6 5 4 3 2 1

International Standard Book Number: 978-1-4398-0756-9 (Hardback)

Library of Congress Cataloging-in-Publication Data

Handbook of public information systems / editors, Christopher M. Shea, G. David Garson. -- 3rd ed.
p. cm.
Includes bibliographical references and index.
ISBN 978-1-4398-0756-9 (alk. paper)
1. Public administration--Information technology. I. Shea, Christopher M. II. Garson, G. David. III. Title.

JF1525.A8H36 2010
352.7'4--dc22 2009034802

Visit the Taylor & Francis Web site at
http://www.taylorandfrancis.com

and the CRC Press Web site at
http://www.crcpress.com

Contents

Preface

In the relatively short amount of time that has passed since the previous edition of this book, the field of public information systems has continued to evolve. This evolution has elucidated many issues that public sector managers face as they wrestle with the information age. As we continue to learn more about e-government and e-governance issues and impacts, the more it becomes apparent that the interrelationships between political environments, organizational environments, and technological capabilities are often difficult to summarize and predict. Commonly held beliefs and understandings are called into question. In other words, as the field advances, our understanding of the complexity of the relevant issues increases, and more guidance becomes available to administrators.

We believe it is appropriate, therefore, that the study of information and communication technologies (ICT) continues to assume a central place in public administration curricula. There is good reason to study and better understand the implementation of ICT projects. While these projects often carry substantial expected benefits, many projects do not fulfill expectations, either in terms of benefits or costs. Also, it might be argued that some IT projects have potential for negative impacts. The prevalence of IT failure to deliver projects on time and within budget, and to do so while also providing for such values as privacy, security, and accountability, is as important a public management challenge as any in our time.

Given the evolution of the field and its central importance to public administrators, it may not be surprising that more than half this third edition of the *Handbook of Public Information Systems* is comprised of new material. We wish to thank all those in government service, academic institutions, and elsewhere who contributed to this edition. Without their generous contributions of time and energy, this volume would not be possible.

Christopher M. Shea
Chapel Hill, NC

G. David Garson
Raleigh, NC

Editors

Christopher M. Shea is clinical assistant professor of health policy and management in the Gillings School of Global Public Health at the University of North Carolina at Chapel Hill, where he serves as director of the Bachelor of Science in Public Health program in health policy and management. He is currently teaching, or has taught, courses in the areas of organizational behavior and management, research methods, business communication, health information systems, and human resources management.

He is a member of the Public Health Informatics Steering Committee and the faculty advisor for the Health Information Management and Systems Society (HIMSS) student interest group, both at the University of North Carolina at Chapel Hill. He also has served as an associate editor of the journal *World Health and Population*, has co-authored a paper appearing in *Electronic Healthcare*, and completed his dissertation on electronic medical record systems (2008). He was inducted into Pi Alpha Alpha, the honor society for the National Association of Schools of Public Affairs and Administration, in 2004.

He earned a Bachelor of Business Administration in Finance and English from James Madison University (1995), a Master of Arts in English from West Virginia University (1998), a Master of Public Administration from North Carolina State University (2004), and a PhD in Public Administration from North Carolina State University (2008).

G. David Garson is full professor of public administration at North Carolina State University (NCSU), where he teaches courses on advanced research methodology, geographic information systems, information technology, e-government, and American government. In 1995, he was recipient of the Donald Campbell Award from the Policy Studies Organization, American Political Science Association, for outstanding contributions to policy research methodology, and in 1997, of the Aaron Wildavsky Book Award from the same organization. In 1999, he won the Okidata Instructional Web Award from the Computers and Multimedia Section of the American Political Science Association, in 2002, received an NCSU Award for Innovative Excellence in Teaching and Learning with Technology, and in 2003, received an award for Outstanding Teaching in Political Science from the American Political Science Association and the National Political Science Honor Society, Pi Sigma Alpha. In 2008, the NCSU Public Administration Program was named in the top 10 PA schools in the nation in information systems management.

Professor Garson is editor of and contributor to *Modern Public Information Technology Systems* (2007); *Patriotic Information Systems: Privacy, Access, and Security Issues of Bush Information Policy* (2007); and *Handbook of Research on Public Information Technology* (2008) and author of *Public Information Technology and E-Governance: Managing the Virtual State* (2006); editor of *Public*

Information Systems: Policy and Management Issues (2003); co-editor of *Digital Government: Principles and Practices* (2003); co-author of *Crime Mapping* (2003); author of *Guide to Writing Quantitative Papers, Theses, and Dissertations* (Dekker, 2001); editor of *Social Dimensions of Information Technology* (2000); *Information Technology and Computer Applications in Public Administration: Issues and Trends* (1999); and *Handbook of Public Information Systems* (1999, 2005); and is author of *Neural Network Analysis for Social Scientists* (1998); *Computer Technology and Social Issues* (1995); *Geographic Databases and Analytic Mapping* (1992); and is author, co-author, editor, or co-editor of 17 other books and author or co-author of over 50 articles. He has also created award-winning American Government computer simulations, CD-ROMs, and six Web sites for Prentice-Hall and Simon & Schuster (1995-1999).

For the last 25 years, he has also served as editor of the *Social Science Computer Review* and is on the editorial board of four additional journals.

Professor Garson received his undergraduate degree in political science from Princeton University (1965) and his doctoral degree in government from Harvard University (1969).

Contributors

Douglas Carr
Department of Public Administration
Oakland University
Rochester, Michigan

T. R. Carr
Department of Public Administration and Policy Analysis
Southern Illinois University Edwardsville
Edwardsville, Illinois

Shaoming Cheng
Department of Public Administration
Florida International University
Miami, Florida

Philip C. Christian
Florida Department of Revenue
Florida International University
Miami, Florida

Roland J. Cole
Sagamore Institute for Policy Research
Indianapolis, Indiana

David H. Coursey
The Decision Theater
Arizona State University
Phoenix, Arizona

Charles N. Davis
Missouri School of Journalism
National Freedom of Information Coalition
Columbia, Missouri

William L. Dougan
Department of Management
University of Wisconsin at Whitewater
Whitewater, Wisconsin

Ed Downey
Department of Public Administration
State University of New York College at Brockport
Brockport, New York

Mary Jane Frisby
Law Firm of Barnes & Thornburg
Indianapolis, Indiana

G. David Garson
Department of Political Science and Public Administration
North Carolina State University
Raleigh, North Carolina

Marilu Goodyear
Department of Public Administration
University of Kansas
Kansas City, Kansas

Carl Grafton
Department of Political Science and Public Administration
Auburn University Montgomery
Montgomery, Alabama

Thomas J. Greitens
Department of Public Administration
Central Michigan University
Mount Pleasant, Michigan

Stephen H. Holden
Touchstone Consulting Group of SRA International, Inc.
Washington, D.C.

Mark Curtis Hoffman
School of Public and Nonprofit Administration
Grand Valley State University
Allendale, Michigan

Sungsoo Hwang
Department of Public Administration
Yeungnam University
Kyungsan, Korea

Jennifer Killingsworth
Florida Fish and Wildlife Conservation Commission
Tallahassee, Florida

Younhee Kim
Department of Political Science
East Carolina University
Greenville, North Carolina

Jeremy R. T. Lewis
Department of Political Science
Huntingdon College
Montgomery, Alabama

Julianne Mahler
Department of Government and Politics
George Mason University
Fairfax, Virginia

Lynn M. Mulkey
Department of Social Sciences
University of South Carolina Beaufort
Bluffton, South Carolina

Patrick R. Mullen
Department of Public Administration
Center for State Policy and Leadership
University of Illinois at Springfield
Springfield, Illinois

Mark R. Nelson
EDUCAUSE Center for Applied Research
National Association of College Stores
Oberlin, Ohio

Rebecca L. Orelli
Department of Management
University of Bologna–Forlì Campus
Forlì, Italy

Emanuele Padovani
Department of Management
University of Bologna–Forlì Campus
Forlì, Italy

Anne Permaloff
Department of Political Science and Public Administration
Auburn University Montgomery
Montgomery, Alabama

Priscilla M. Regan
Department of Government and Politics
George Mason University
Fairfax, Virginia

Lee Roberson
Web Communications Office
Northwestern University
Evanston, Illinois

Carmine Scavo
Department of Political Science
East Carolina University
Greenville, North Carolina

Alicia Schatteman
Department of Public Management
John Jay College of Criminal Justice
New York, New York

Tino Schuppan
German Institute for Electronic Government
University of Potsdam
Potsdam, Germany

Eric Scorsone
Department of Agricultural Economics
Michigan State University
East Lansing, Michigan

Christopher M. Shea
Department of Health Policy and Administration
University of North Carolina at Chapel Hill
Chapel Hill, North Carolina

Michael Stonis
Prosch Consulting
Hanover Park, Illinois

Roger R. Stough
Department of Public Policy
George Mason University
Fairfax, Virginia

Gregory Streib
Department of Public Administration and Urban Studies
Georgia State University
Atlanta, Georgia

Marc A. Thibault
Department of Public Policy
George Mason University
Fairfax, Virginia

Irvin B. Vann
U.S. Census Bureau
Washington, D.C.

Peter M. Webster
Patrick Power Library
Saint Mary's University
Halifax, Nova Scotia, Canada

Linda Williams
Department of Public Administration
University of Kansas
Lawrence, Kansas

Katherine G. Willoughby
Department of Public Management and Policy
Georgia State University
Atlanta, Georgia

INTRODUCTION 1

Chapter 1

An Introduction to Public Information Systems

Christopher M. Shea

CONTENTS

1.1 Introduction

In the previous edition of this book, it was noted that information systems in public agencies are pervasive for all levels of government [Garson 2005]. However, despite this pervasiveness (or perhaps because of it), there is much to learn about the implications these systems have for a variety of stakeholder groups, including public administrators, businesses, and citizens. Acknowledging the complexity of the roles and impacts of information systems in public agencies can be a useful first step toward reconciling the perspectives of various stakeholders.

Information systems offer both promise and challenges. Most practitioners and researchers generally would agree that information and communication technologies (ICT) can be valuable resources for public agencies. When the ICTs are well managed, they can contribute to increasing efficiency of work processes within public agencies, facilitating information exchange between citizens and government, and improving services for citizens [United Nations 2008]. Managing information systems effectively, however, is no easy task. Part of the management challenge occurs

because ICTs can alter, and be adapted to, organizational structures, power relations, and work processes [Rogers 2003]. The complex sets of relationships make predicting the impact of information systems difficult, and the complexity increases when the systems cross organizational boundaries [Fountain 2001].

The policy environment within which a public agency operates poses another challenge. Policy issues may prompt and also emerge from the use of ICTs. For example, efforts to increase efficiency or effectiveness of services through information systems may carry with them trade-offs and, therefore, raise concerns about such issues as access to the services, privacy, and security of personal data [Garson 2006]. Along these lines, there is still much to learn about the relationship between ICTs and e-governance outcomes such as citizen engagement and public discourse [Dawes 2008].

Facilitating a better understanding of public information systems issues, challenges, and strategies is the primary purpose of this book. Before embarking on this journey, however, it is necessary to acknowledge the broad scope of public information systems. Public agencies have a multitude of missions and, therefore, various information system needs. Providing due attention to each type of agency and each information system is quite difficult to accomplish in a single volume. However, we believe that many issues, challenges, and strategies apply to a range of organizational and information system contexts. In this regard, we hope that the present volume contributes to the learning process for students and current practitioners interested in ICTs in the public sector.

This volume is organized into broad sections, enabling a discussion of multiple perspectives. These sections include:

1. Policy Environments and Issues
2. Policy Research
3. Organizational Issues and Management Applications
4. Organizational Research
5. Performance Reporting

The rationale for these sections is to provide a sampling of key issues involving stakeholder interests, challenges related to leadership and management within organizations, illustrations of the intersection between policy and management, and models for further inquiry into information systems in the public sector.

1.2 Policy Environments and Issues

E-government initiatives generally aim to improve efficiency and effectiveness of the delivery of public services by improving information flows between government agencies and citizens, government agencies and businesses, and between government agencies themselves [United Nations 2008]. These aims must be strived for within certain constraints, of course, including individual privacy and information equity [Garson 2006], as well as the political climate for e-government and information sharing. The September 11th terrorist attacks, for example, amplified discussions about the tension between terrorism prevention efforts and individual rights [Nelson 2002].

The *Policy Environments and Issues* section of this book highlights several key areas in the policy domain relevant to public information systems, including the policy environment for e-government, e-government capability as a facilitator of policy implementation, access to public records, protecting intellectual property, the development of a resource infrastructure for research,

citizen participation, and individual privacy. In addition, both this section and the Organizational Issues and Management Applications section conclude with a case study chapter. These case studies illustrate the complexity of policy and organizational issues within specific contexts, allowing the reader to analyze the situation and develop lessons learned to be carried forward to future experiences.

1.3 Organizational Issues and Management Applications

From an organizational perspective, information systems have far-reaching implications. Beginning with the adoption decision-making process, the agency's leadership plays an important role in the success of a given ICT. In all types of organizations, adoption decisions should involve analysis beyond the direct financial cost of acquiring the technology. The "true cost" involves consideration of such other aspects as the need for technical support to maintain the new technologies, as well as a possible decrease in productivity for some period of time during implementation (e.g., Kuperman and Gibson 2003). It is widely documented that a substantial number of information system projects fail to be implemented within budget or successfully at all. It is also commonly believed that these failures result from failures in management, not simply failures in technology. A lack of commitment to the initiative among top management, lack of a participative approach to implementation, and inadequate planning are often cited among the causes for implementation failure [Garson 2006]. Furthermore, it is often difficult to clearly delineate between implementation process and implementation completion because the "fit" between the information system and the organizational structure, priorities, human resource capabilities, and work processes evolve over time. The *Organizational Issues and Management Applications* section of this book surveys topics related to this "fit."

1.4 Policy and Organizational Research

Empirical research demonstrates systematic analysis guided by specific research questions and aims. This volume includes two research sections: *Policy Research* and *Organizational Research*. The research chapters address a range of policy and organizational topics and employ various analytical methods, providing the reader with valuable insights into the topic of interest and the research process. The overall aim of this section of the book is to provide readers with additional exposure to policy and organizational topics, as well as models for systematically exploring some of the pressing issues that public administrators, policy makers, and researchers are facing related to public information systems.

1.5 Performance Reporting

When considering public information systems as a content area, it is sometimes difficult to identify a clear line separating the public policy domain from the organizational domain. After all, policy is implemented by organizations and often is developed or modified in an attempt to improve service delivery for citizens. The topic of performance reporting for public agencies exemplifies the blurring of this line very well due to the number of stakeholders involved and the complexity of the technical and human factors inherent in such efforts. Because the challenge of performance

reporting is so pervasive, we have included a section in this new edition dedicated to the topic. The chapters in this section provide discussions related to federal, state, and local levels of government; include a cross-country comparison; and address various stakeholder perspectives, budgetary implications, and data challenges associated with performance reporting.

1.6 Conclusion

We believe that the structure and content of the present volume offer discussions about public information systems from a variety of perspectives. In doing so we hope that it facilitates learning about the conceptual and theoretical challenges facing the field, as well as the practical implications of information systems for public agencies and the citizens they serve.

References

Dawes, S.S. (2008). The evolution and continuing challenges of e-governance. *Public Administration Review*, 68, S86–S102.

Fountain, J.E. (2001). *Building the Virtual State*. Washington, D.C.: Brookings Institution Press.

Garson, G.D. (2005). Public information systems in the 21st century. In G.D. Garson (Ed.), *Handbook of Public Information Systems,* 2nd ed. (pp. 3–10). Boca Raton: Taylor and Francis Group.

Garson, G.D. (2006). *Public Information Technology and E-Governance: Managing the Virtual State*. Sudbury, MA: Jones and Bartlett.

Kuperman, G.J. and Gibson, R.F. (2003). Computer physician order entry: Benefits, costs, and issues. *Annals of Internal Medicine*, 139(1), 31–39.

Nelson, L. (2002). Protecting the common good: technology, objectivity, and privacy. *Public Administration Review*, 62, S69–S73.

Rogers, E.M. (2003). *Diffusion of Innovations*, 5th ed. New York: Free Press.

United Nations (2008). United Nations e-government survey 2008: From e-government to connected governance. Available at http://unpangroups/p1.un.org/intradoc/ublic/documents/un/unpan028607.pdf

Chapter 2

Public Information Technology and E-Government: A Historical Timeline

G. David Garson

This chapter traces the history of public information technology from the 1895 Depository Library Program through to the Intellectual Property Act of 2008 and proposed legislation for 2009, in the form of a chronological listing of relevant events drawn from a wide variety of governmental and other sources.

1895 The Depository Library Program (44 USC 1902) is taken over by the Government Printing Office. Originating in the 1840s, the Depository Library program promotes the practice of agencies making their publications available via the U.S. Superintendent of Documents. A century later, in the 1990s, the Office of the Superintendent of Documents moved increasingly toward electronic publication formats.

1943 Colossus, used for code-breaking, is an early computer funded and run by the British government.

1944 Vannevar Bush, Director of the Office of Scientific Research and Development, authored a report at the request of President Roosevelt entitled *Science, The Endless Frontier: A Report to the President*. It called for promotion of interchange of scientific knowledge, long before NSFnet. In July, 1945, Bush published the article, "As We May Think," in the *Atlantic Monthly*, describing a desktop "memex," with functions similar to the modern Internet.

1942-1946
The ENIAC computer is developed by J. Presper Eckert and John W. Mauchly at the University of Pennsylvania for the U.S. Army, which needed it for ballistic calculations.

1946 The Administrative Procedures Act required hearings and public participation in regulatory rule-making. In the late 1990s, this became a legal basis for electronic public participation in e-rulemaking.

1950 The Federal Records Act of 1950 (amended 1964) mandated that each agency head would preserve "adequate and proper documentation of the organization, functions, policies, decisions, procedures, and essential transactions of the agency." Combined with the 1966 Freedom of Information Act and the 1996 Electronic Freedom of Information Act, the Federal Records Act is the legal basis for the mandate that federal agencies make information available online.

1951 Remington Rand sells the first UNIVAC computer to the Census Bureau and subsequently five other clients. The first private sector purchase was General Electric, three years later, in 1954. UNIVACs weighed eight tons and had a speed of 1,000 instructions per second. The UNIVAC was phased out six years later.

1952 IBM sells the 701 computer to the U.S. government for defense purposes connected to the Korean War. The 701 marks the advent of widespread mainframe computing in the federal government.

1957 In response to the Russian launching of Sputnik-1, the earth's first artificial satellite, the U.S. government established the Advanced Research Projects Agency (ARPA) within the Department of Defense to promote defense technology. Twelve years later, ARPA-net goes online, the predecessor of the Internet.

1958 SAGE (Semi-Automatic Ground Environment) was installed at the McGuire Air Force Base in New Jersey. Used for air defense, SAGE and the related Whirlwind project involved major advances in data communications technology.

1960 President Eisenhower placed NASA in charge of communications satellite development. Echo, NASA's first satellite, was launched August 12 and functioned to reflect radio waves back to earth.

1962 The Communications Act of 1962 combined the efforts of AT&T, NASA, and the Department of Defense to create Comsat on February 1, 1963. In 1964, led by Comsat, a consortium of 19 nations formed IntelSat with the purpose of providing global satellite coverage and interconnectivity. IntelSat, in 1965, launched the Early Bird satellite, the world's first commercial communications satellite, serving the Atlantic Ocean Region. Global satellite coverage is achieved by IntelSat seven years later, in 1969.

1965 In a precursor to the Internet, ARPA sponsors a study about a "cooperative network of time-sharing computers" at MIT's Lincoln Lab and the System Development Corporation (Santa Monica, CA), directly linked via a dedicated 1,200 bps phone line. A DEC computer at ARPA was later added to form "The Experimental Network."

1966 The Freedom of Information Act of 1966 (FOIA; Public Law 89-554) established the right of public access to government information. Agencies were required to make information available through automatic channels or upon specific individual requests. The law specified certain exemptions, including classified defense and foreign policy matters; internal agency personnel rules and practices; information protected by other laws (e.g., many contractor bids); commercial trade secrets and financial information; documents; normally privileged in the civil discovery context; personal information affecting an individual's privacy; investigatory records compiled for law enforcement purposes; information that might reasonably be construed to interfere with law enforcement or deprive a person of a fair trial; information revealing the identity of a confidential source; information needed to protect

the safety of individuals; records of financial institutions; and geographical information on oil wells.

1969 ARPAnet, the predecessor of the Internet, went online with four nodes and reached 15 nodes by 1971.

1972 E-mail comes to ARPAnet.

1972 The Technology Assessment Act of 1972 created the Office of Technology Assessment (OTA), later disbanded as other information technology (IT) agencies emerged. The OTA, along with the Congressional Research Service (reconstituted and expanded by the Legislative Reorganization Act of 1970) and the Congressional Budget Office (created by the Budget Impoundment Act of 1974) became major users of FOIA to access executive agency data.

1972 The Federal Advisory Committee Act (FACA) was an elaboration of the 1966 FOIA legislation. It required timely notice in the *Federal Register* of advisory committee meetings. FACA also required agencies to allow interested parties to appear or file written statements, mandated that advisory committees keep detailed minutes (to include a record of the persons attending, documents received, documents issued, and documents approved by committees). These materials and all other advisory committee minutes, transcripts, reports, and studies were required to be available for public inspection.

1973 The first international connections were added to ARPANET, from University College of London (England) via NORSAR (Norway).

1973 Bob Kahn started the "internetting" research program at ARPAKahn, and Vint Cerf developed many of the fundamental concepts on which the Internet rests.

1974 IntelSat activated a "Hot Line" for direct telecommunication between the White House and the Kremlin.

1974 Telenet is started as the first public packet data service. As such, Telenet is the first commercial version of ARPAnet.

1974 The Privacy Act of 1974 (Public Law 93-579; 5 USC 552a) protected the privacy of individuals identified in information systems maintained by federal agencies. The collection, maintenance, use, and dissemination of information were regulated. The Privacy Act forbade disclosure of any record containing personal information, unless released with the prior written consent of the individual. Agencies were also mandated to provide individuals with access to their records.

1974 The Office of Federal Procurement Policy Act created the Office of Federal Procurement Policy (OFPP). In 1979, OFPP set up the Federal Procurement Data Center as a computerized repository of detailed information on all purchases of over $25,000 and summary details of smaller ones. OFPP came under the GSA in 1982.

1975 ARPAnet initiated online discussion lists.

1976 The Government in the Sunshine Act was an elaboration of the 1966 FOIA. It established the principle that the public is entitled to the fullest practicable information regarding the decision-making processes of federal agencies.

1977 The University of Wisconsin established TheoryNet, which provided electronic mail to over 100 researchers.

1978 The Presidential Records Act changed the legal ownership of the official records of the President from private to public, further expanding public access to federal information.

1979 USENET was established. It soon became the umbrella for hundreds of online discussion groups (lists).

1980 ARPANET suffered its first viruses, grinding the network to a complete halt on October 27 because of a status message virus that was introduced accidentally.

1980 The Paperwork Reduction Act of 1980 (PRA) mandated an Information Resources Management (IRM) approach to federal data. This represented the first unified policy framework for information resource management at the federal level. The director of the OMB was given responsibility for developing an IRM policy and for overseeing its implementation. A major revision of the PRA in 1995 mandated strategic planning for IRM.

1981 BITNET, the "Because It's Time NETwork," was initiated as a cooperative network at the City University of New York. BITNET provided electronic mail, file transfer, and listserv functionality. ARPANET, BITNET, and NSFNET were the three immediate precursors of the Internet.

1984 The domain name system (DNS) was established, allowing users to employ mnemonic Internet addresses instead of number addresses.

1986 The National Science Foundation funded NSFNet, a long-haul backbone network with a speed of 56K bps.

1986 The Computer Fraud and Abuse Act imposed fines and imprisonment of up to 20 years for various types of unauthorized computer access and fraud. A 1996 amendment extended coverage to all computers involved in interstate commerce and communications.

1986 The Rehabilitation Act Amendments of 1986 (sometimes called the Rehabilitation Act of 1986) added Section 508 to the Rehabilitation Act of 1973. Section 508 required federal agencies to establish guidelines for disability-accessible IT. Agency accessibility evaluations were mandated, and the Attorney General was charged with compliance evaluation. The deadline for agencies to have accessibility standards in place was extended to August 7, 2000.

1987 NSF signed a cooperative agreement to manage NSFNET in cooperation with IBM, MCI, and Merit Network, Inc. By the end of 1987, there were 10,000 Internet hosts.

1987 The Computer Security Act (CSA) mandated that the National Institute of Standards and Technology (NIST) develop security standards and guidelines for federal computer systems. The CSA also required that all federal agencies and their contractors establish computer security plans.

1988 The Computer Matching and Privacy Protection Act was an amendment to the Privacy Act of 1974, which extended Privacy Act protections to most forms of computer matching of individual records across agencies.

1989 The number of Internet hosts reached 100,000.

1990 ARPAnet was phased out, eclipsed by NSFNET.

1990 The Chief Financial Officers Act (CFOA) was focused on improving federal financial management and reporting practices but also called for (1) complete and timely information prepared on a uniform basis and which is responsive to the financial information needs of agency management; (2) the development and reporting of cost information; (3) the integration of accounting and budgeting information; and (4) the systematic measurement of performance. These four objectives required development of a financial information system and networked access to it, as well as a computerized performance tracking system.

1991 The High Performance Computing Act (HPCA) authorized the President to create a "National High-Performance Computing Program" for high-speed networking and established the National Research and Education Network (NREN). The OMB was given authority to review department budget requests for this program. The HPCA is sometimes called the "Gore Act" due to the activism and leadership of Vice President Al Gore.

1992 Tim Berners-Lee developed the World Wide Web, and Mosaic software was released to surf the Web. The number of Internet hosts reached one million.

1992 The first White House home page was launched on the Web.

1992 In *Quill Corporation v. North Dakota*, the Supreme Court explicitly upheld the precedent of its *Bellas Hess (1967)* case. These principles prohibited Internet sales taxation, overruling a North Dakota Supreme Court finding that technology had made the 1967 ruling obsolete. The tax prohibition applied to vendors with no physical presence in the state.

1992 Up to 1992, access to the Internet backbone was limited by the NSF's "Acceptable Use Policy." This restriction of the National Science Foundation Act prohibited commercial traffic on the Internet. Up to 1992, all Internet traffic had to be educational, scientific, or research-oriented. With the support of Congressman Rick Boucher (D-VA), Chairman of the Science Subcommittee of the House Committee on Science, Space, and Technology, legislation was passed, and in November, 1992, President Bush signed new legislation that repealed the Acceptable Use Policy, replacing it with language that permitted commercial traffic on the Internet backbone.

1992 The Information and Technology Act promoted technology development in public education, health care, and industry and called on NSF to fund efforts to connect K-12 classrooms to NSFNET.

1993 The National Information Infrastructure Act mandated funding priority in federal research and development efforts be given to accelerated development of high-performance computing and high-speed networking services.

1993 Federal funding of the Internet ended as the Internet became a private sector entity. Routing began through private providers in 1994. NSFNET reverted to being a limited research network.

1993 National Performance Review (NPR) was established on March 3. NPR represented the Clinton Administration's emphasis on IT as a tool to reform government, under the leadership of Vice President Al Gore. The NPR report, *Creating a Government that Works Better and Costs Less: Reengineering Through Information Technology,* illustrated that the reinventing government movement, originated with a focus on decentralization/devolution, had come to see e-government as a major reform thrust. NPR was later renamed the National Partnership for Reinventing Government (NPRG).

1993 The Government Information Technology Services Board was created to help implement NPR in IT areas.

1993 The Government Performance and Results Act (GPRA) required agencies to prepare multiyear strategic plans that described agency mission goals and approaches for reaching them. The act required agencies to develop annual performance plans that OMB was to use to prepare a federal performance plan that is submitted to the Congress along with the President's annual budget submission. The agency plans must establish measurable goals for program activities and describe the methods by which performance toward those goals is measured. The act also required agencies to prepare annual program performance reports to review progress toward annual performance goals, which, of course, included IT goals.

1993 Executive Order 12862: Setting Customer Service Standards. This executive order mandated that all agencies, including IT agencies, identify their customers, customer needs, and set standards and benchmarks for customer service. Customer-orientation became a keystone of e-government policy later in the decade.

1993 The Government Information Locator Service (GILS) was announced February 22. GILS was established as an Internet index to federal materials. It reflected a decision of the Clinton

administration to support direct agency release of electronic information, reversing a Reagan-era policy that mandated that release should be contracted through private third parties.

1993 The White House established public email to the president and vice-president.

1994 The Commerce Department's National Telecommunications and Information Administration's (NTIA) report, "Falling Through the Net," brought widespread public attention to the issue of the "digital divide."

1994 The Federal Acquisition Streamlining Act (FASA) required agencies to define tolerance standards for—and to monitor—cost, time schedule, and performance goals for federal acquisition programs, including IT projects. If a program fell out of tolerance, FASA required the agency head to review, take necessary actions, and, if necessary, terminate the program.

1995 The 1995 amendment to the Paperwork Reduction Act of 1980 (PRA; this amendment is sometimes called the Paperwork Reduction Act of 1995) established strategic planning principles for information resources management, including setting IT standards, applied life cycle management principles, mandating cross-agency IT initiatives, and setting technology investment guidelines. The PRA designated senior information resources manager positions in major federal agencies and created the Office of Information and Regulatory Affairs (OIRA) within OMB to provide central oversight of information management activities across the federal government. OIRA was mandated to "develop and maintain a government-wide strategic plan for information resources management." The OIRA director became, in principle, the main IT advisor to the director of the OMB. The PRA also called on agencies to "ensure that the public has timely and equitable access to the agency's public information," including electronically. Agency use of GILS (the Government Information Locator Service, an Internet index to federal information) was mandated.

1996 The Telecommunications Act of 1996 provided for a Universal Service Fund fee (a telephone tax, also known as the "E-rate" fund or fee), part of which became used on Clinton administration initiative to provide modem-based Internet access to schools, libraries, Indian reservations, and other "digital divide" target groups.

1996 The World Trade Organization, meeting in Singapore, reduced tariffs on IT trade items, thereby encouraging global ICT (information and communication technology) development.

1996 The Electronic Freedom of Information Act Amendment of 1996 (EFOIA) extended the right of citizens to access executive agency records to include access to electronic formats and online opportunities for access information. EFOIA officially defined a "record" in very broad terms. Release of information had to be in a format convenient to the user, not an agency option, as previous case law had held. Agencies were required to make "reasonable efforts" to search electronic databases for records. Electronic Reading Rooms were mandated to include "policy statements, administrative rulings and manuals, and other materials that affect members of the public."

1996 The Communications Decency Act (CDA) prohibited Internet distribution of "indecent" materials. A few months later, a three-judge panel issued an injunction against its enforcement. The Supreme Court unanimously ruled most of the CDA unconstitutional in 1997.

1996 The Federal Acquisition Reform Act (FARA) made purchasing of IT more flexible than under the prior Brooks Act. FARA gave the GSA a powerful oversight role, but it functioned more like an "IT commodities broker" than as an "IT policeman."

1996 OMB Circular A-130 implemented the Paperwork Reduction Act of 1980 and 1995 amendments by establishing government-wide uniform information resources management

practices. It mandates life cycle information management planning and work process redesign. The Department of Commerce is also mandated to improve federal telecommunications systems. Circular A-130 is revised and reissued periodically.

1996 The Federal Financial Management Improvement Act (FFMIA) required agency financial management systems to comply with federal financial management system requirements, applicable federal accounting standards, and the *U.S. Government Standard General Ledger* (SGL). To the extent that federal accounting standards specify IT aspects, the FFMIA requires uniformity of IT accounting across the federal government.

1996 The Clinger–Cohen Act of 1996 (originally named the Information Technology Management Reform Act of 1996, an amendment to the Paperwork Reduction Act of 1980) established a chief information officer (CIO) in every federal agency, making agencies responsible for developing an IT plan that relates IT planning to agency missions and goals. The Clinger–Cohen Act also mandated top management involvement in IT strategic planning, using IT portfolio management approaches. The oversight role of the director of the OMB was strengthened. The Clinger–Cohen Act also:

1. Encouraged federal agencies to evaluate and adopt best management and acquisition practices used by private and public sector organizations;
2. Required agencies to base decisions about IT investments on quantitative and qualitative factors related to costs, benefits, and risks, and to use performance data to demonstrate how well the IT expenditures support improvements to agency programs through measures like reduced costs, improved productivity, and higher client satisfaction; and
3. Streamlined the IT acquisition process by ending the General Services Administration's (GSA's) central acquisition authority. It placed procurement responsibility directly with federal agencies and encouraged adoption of smaller, more modular IT projects.

Later, when e-government became a priority, the existence of the CIO strategic planning structure was an important element facilitating e-government implementation at the federal level.

1996 President Clinton issued Executive Order 13011, a companion to the Clinger–Cohen Act. EO 13011 sought to improve management through an alignment of agency technology goals with strategic organizational goals and through interagency coordination of technology applications. EO 13011 created the CIO Council, an advisory body from 28 federal agencies plus senior OMB/OIRA personnel. The CIO Council was intended to be the central interagency forum for improving agency IT practices. EO 13011 represented the presidential "seal of approval" for e-government. In practice, the CIO Council was eclipsed by initiatives from the OMB itself and did not become a major generator of Bush administration IT initiatives.

1996 The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), also known as welfare reform, required interstate and intergovernmental coordination of IT systems to ensure that no individual exceeded the allotted five-year lifetime cap on assistance.

1997 The U.S. Department of Agriculture (USDA) became the first federal agency to engage in e-rulemaking, soliciting Web-based comments on rules for organic foods. This initiative won the 1998 Government Technology Leadership Award.

1998 Virginia, then Colorado became the first states to have a cabinet-level Secretary of Information Technology.

1998 The Digital Millennium Copyright Act extended copyrights to digital media, but the "Fair Use Doctrine" was retained to promote the rights of universities, libraries, and other occasional users of intellectual property. The act also prohibited removal of "copyright management information" from electronic media, outlawing the circumvention of anti-piracy access controls.

1998 The 1998 Amendments to the Rehabilitation Act of 1973, signed by President Clinton on August 7, required federal agencies to make their electronic information available to people with disabilities, including their Internet pages. This strengthened the Section 508 disability access standards mandated by the 1986 amendments to the Rehabilitation Act. Federal agencies were exempted from Section 508 implementation where the disability initiative in question would constitute an "undue burden."

1998 The Presidential Memorandum of May 14, 1998: Privacy and Personal Information in Federal Records. This memorandum directed federal agencies to review their compliance with the Privacy Act of 1974. Each agency was to designate a Senior Official for Privacy Policy. Each agency was required to conduct a Privacy Act compliance review.

1998 Presidential Decision Directive 63: Protecting America's Critical Infrastructures. Based on recommendations of the President's Commission on Critical Infrastructure Protection, this directive set the goal of establishing an integrated, secure IT infrastructure by 2003. A national center to warn of infrastructure attacks was established in the National Infrastructure Protection Center. Agencies were required to establish performance measures of Web site security.

1998 The Government Paperwork Elimination Act of 1998 (GPEA, signed into law on October 21) authorized the OMB to acquire alternative information technologies for use by executive agencies (Sec. 1702); provided support for electronic signatures (Secs. 1703–1707); and provided for the electronic filing of employment forms (Sec. 1705). Electronic filing of most forms had to be in place by October 21, 2003. The GPEA was the legal framework for accepting electronic records and electronic signatures as legally valid and enforceable, and it also represented Congressional endorsement of the e-government strategy.

1998 The Federal Activities Inventory Reform (FAIR) Act required agencies to inventory and report all of their commercial activities to the OMB. The FAIR Act then established a two-step administrative challenge and appeals process under which an interested party may challenge the omission or the inclusion of a particular activity on the inventory as a "commercial activity." While the FAIR Act did not require agencies to privatize, outsource, or complete their commercial activities, subsequent OMB guidelines required that nonexempt commercial activities undergo a cost evaluation for a "make or buy" decision. Each time a federal agency head considers outsourcing to the private sector, a competitive process is required. FAIR put pressure on agencies to outsource IT operations. Though "core operations" were not to be outsourced, CIOs sometimes felt that the core was encroached upon and that it was difficult to establish effective performance standards with vendors.

1998 IRS Restructuring and Reform Act of 1998 (RRA). Section 2001c promoted electronic filing of tax returns. Section 2003d required the IRS to establish that all forms, instructions, publications, and other guidance be available via the Internet. Section 2003e provided for tax return preparers to be authorized electronically to communicate with the IRS. Section 2005 provided taxpayer electronic access to their account by 2006.

1998 The National Archives and Records Administration (NARA) Bulletin 98-02: Disposition of Electronic Records, reminded agencies of their obligations under federal law to provide documentation of agency activities, including Web site pages and records.

1998 The Postal Service launched e-commerce, selling stamps via the Web.

1998 The Internet Tax Freedom Act of 1998 (ITFA) imposed a three-year moratorium on state and local taxation on Internet access.

1999 The Presidential Memo of December 17: Electronic Government reflected Clinton's endorsement of the concept of a federal government-wide portal (http://www.FirstGov.gov). Clinton announced 12 steps agencies can take including getting forms online by December 2000, posting online privacy policies, posting email contact information, identifying e-gov "best practices," and more.

1999 The Trademark Cyberpiracy Prevention Act outlawed "cybersquatting," giving businesses protection against those who register well-known domain names as a means of extorting fees from the true owners of existing trademarks.

1999 Fiscal year (FY) 1999 National Defense Authorization Act required the Department of Defense to establish a single electronic mall system for procurement.

2000 The President's Management Council adopted digital government as one of its top three priorities.

2000 On June 24, President Clinton made the first presidential Internet address to the nation, calling for the establishment of the FirstGov.gov portal.

2000 FirstGov.gov was launched September 22 as a Clinton management initiative. It was the official U.S. government portal, designed to be a trusted one-stop gateway to federal services for citizens, businesses, and agencies. At launch, it was a gateway to 47 million federal government Web pages. FirstGov.gov also linked state, local, District of Columbia, and tribal government pages in an attempt to provide integrated service information in particular areas, such as travel. It was managed by the Office of Citizen Services and Communications within the GSA.

2000 President Clinton asked Congress for $50 million to provide computers and Internet access to the poor, and requested $2 billion in tax incentives for the same purpose. The Universal Service Fund Fee, a telephone tax created in 1996, paid for these incentives.

2000 In Election 2000, both candidates (Gore and Bush) advocated digital government expansion.

2000 The Electronic Signatures in Global and National Commerce Act (ESIGN) made digital signatures legal in all 50 states, essential for the expansion of e-commerce.

2000 The OMB revised Circular A-130 to include a mandate for IT Portfolio Management, a management which requires a strategic approach to IT investment and risk.

2000 The Government Information Security Reform Act (GISRA; located within the FY 2001 Defense Authorization Act) amended the Paperwork Reduction Act of 1995 by enacting a new subchapter on "Information Security." Sometimes called the "Security Act," this legislation required the establishment of agency-wide information security programs, annual agency program reviews, annual independent evaluations of agency programs and practices, agency reporting to OMB, and OMB reporting to Congress. GISRA covered programs for both unclassified and national security systems but exempted agencies operating national security systems from OMB oversight. The Security Act is to be implemented consistently with the Computer Security Act of 1987.

2001 *The President's Management Agenda*, issued in August, committed the Bush administration to five major management objectives, one of which was electronic government.

2001 The Congressional Federal Telework Mandate of 2001 (part of the Department of Transportation Appropriations Act of 2001) stated, "each executive agency shall establish a policy under which eligible employees of the agency may participate in telecommuting to the maximum extent possible without diminished employee performance."

2001 In June, the OMB created the position of Associate Director for Information Technology and E-Government. This gave the OMB a "point man" to give higher priority to IT initiatives, particularly the goal of creating a "citizen-centric government." In essence, this position was given a mandate to provide leadership to all federal IT implementation, including a special emphasis on e-government. The Associate Director also directed the activities of the CIO Council. Mark Forman was the first incumbent.

2001 Information Quality Act (IQA) is Section 515 of the Treasury and General Government Appropriations Act for FY 2001, passed as a "rider." Section 515 charged OMB with the task of developing government-wide guidelines to ensure and maximize the quality of information disseminated by agencies. These guidelines were published in October, 2002. Under the guidelines, agencies must have a data quality control policy; quality control procedures must be applied before information can be disseminated; and each agency must develop an administrative mechanism whereby affected parties can request that agencies correct poor quality information (that is, an appeals process was mandated).

2001 Executive Order 13231: Critical Infrastructure Protection in the Information Age was issued in October, following 9/11, creating the President's Critical Infrastructure Protection Board. The Board is the central focus in the Executive Branch for cyberspace security. It is composed of senior officials from more than 20 departments and agencies.

2001 The USA Patriot Act became law on October 26. It gave government investigators greater authority to track e-mail and to eavesdrop on telecommunications. In September 2002, the Court of Review interpreted the USA Patriot Act to mean that surveillance orders under the Foreign Intelligence Surveillance Act could apply to criminal as well as terrorist cases.

2001 President Bush signed the Internet Access Taxation Moratorium on November 28, extending the 1998 ITFA to November 1, 2003. At this point, online spending was expected to account for 15% of holiday 2001 spending. The moratorium on Internet taxation was seen by the Bush administration as an economic stimulus as well as in promotion of Internet industries, but state governments feared significant revenue losses.

2002 The first Chief Technology Officer (CTO) for the federal government was appointed. This officer was to oversee the implementation of e-government initiatives. Casey Coleman, heading up the GSA's Office of Citizen Services, was appointed July 25.

2002 The OMB issued the document *E-Government Strategy* on February 27. This document set forth Bush administration e-government principles: citizen-centric, results-oriented, market-based. It also called for increased cross-agency data sharing. Some 34 specific projects are identified for funding, including the 22 initially announced in the "Quicksilver Initiative" in October, 2001:

GOVERNMENT TO CITIZEN

1. USA Service (GSA)
2. EZ Tax Filing (Treasury)
3. Online Access for Loans (DoEd)
4. Recreation One Stop (Interior)
5. Eligibility Assistance Online (Labor)

GOVERNMENT TO BUSINESS

1. Federal Asset Sales (GSA)
2. Online Rulemaking Management (DOT)
3. Simplified and Unified Tax and Wage Reporting (Treasury)

4. Consolidated Health Informatics (HHS)
5. Business Compliance One Stop (SBA)
6. International Trade Process Streamlining (Commerce)

GOVERNMENT TO GOVERNMENT
1. E-Vital (SSA)
2. E-Grants (HHS)
3. Disaster Assistance and Crisis Response (FEMA)
4. Geospatial Information One Stop (Interior)
5. Wireless Networks (Justice)

INTERNAL EFFECTIVENESS/EFFICIENCY
1. E-Training (OPM)
2. Recruitment One Stop (OPM)
3. Enterprise HR Integration (OPM)
4. Integrated Acquisition (GSA)
5. E-Records Management (NARA)
6. Enterprise Case Management (Justice)

2002 The Homeland Security Act established a CIO for the new Department of Homeland Security. The CIO was to oversee the largest consolidation of federal databases in U.S. history. Other provisions of Title 2 (the Information Analysis and Infrastructure Protection title) included:
- Section 201. The Office of Under Secretary for Information Analysis and Infrastructure Protection was created to receive and integrate security information; design and protect the security of data; issue security advisories to the public.
- Section 202. Transferred these units: the National Infrastructure Protection Center of the FBI (other than the Computer Investigations and Operations Section), the National Communications System of the Department of Defense, the Critical Infrastructure Assurance Office of the Department of Commerce, the Computer Security Division of the National Institute of Standards and Technology, the National Infrastructure Simulation and Analysis Center of the Department of Energy, and the Federal Computer Incident Response Center of the GSA.
- Section 203. Access to information. This section established the Secretary of Homeland Security's entitlement to receive intelligence and other information from agencies.
- Section 204 of the Homeland Security Act allowed the federal government to deny FOIA requests regarding information voluntarily provided by non-federal parties to the Department of Homeland Security.

2002 Acting on a February 2002 recommendation from the Federal CIO Council, the OMB established the Federal Enterprise Architecture Program Management Office (FEAPMO) on February 6, 2002. In 2002 FEAPMO issued "The Business Reference Model Version 1.0," which created a functional (not department-based) classification of all government services with a view to its use by OMB for cross-agency reviews to eliminate redundant IT investments and promote re-usable IT components. A Performance Reference Model (Fall 2002) set general performance measurement metrics. Data and Information Reference Model data needed to support Enterprise Architecture. Overall, this was reminiscent of the

1960s PPB: functional, not line item budgeting; emphasis on empirical measurement of performance; and strengthening top management oversight capabilities.

2002 The OMB called for a uniform protocol for e-rulemaking by the end of 2003.

2002 The GSA and the Office of Federal Procurement Policy (OFPP), with involvement from DOD, NASA, and NIH, advanced e-procurement by establishing the PPIRS (Past Performance Information Retrieval System) to give online access to past vendor performance records.

2002 President Bush issued a "Presidential Memo on the Importance of E-Government" in July, stating, "My administration's vision for government reform is guided by three principles. Government should be citizen-centered, results-oriented, and market-based."

2002 The OMB issued a revision of OMB Circular A-16 in August, setting guidelines for standardizing GIS data collection records. This laid the basis for its Geospatial One Stop portal, one of the eventually 24 OMB e-government "Quicksilver" initiatives. Circular A-16 was originally issued in 1953 to give OMB authority over surveying and mapping.

2002 The OMB issued a revision of OMB Circular A-76 in October, replacing lowest-cost acquisition with best-value acquisition, a goal long sought by CIOs. The circular also encouraged outsourcing in line with the Bush administration's goal to outsource 15% of "noninherently governmental jobs."

2002 The Cyber Security Research and Development Act (CSRDA) passed as part of the Homeland Security Act, enacted November 27, and authorized funding for new computer and network security research and grant programs. It also shielded Internet service providers (ISPs) from customer lawsuits when they revealed customer information to law enforcement authorities.

2002 The Enhanced Border Security and Visa Entry Reform Act of 2002 mandated that the 27 Visa Waiver Program countries would have to establish biometric passport plans by 2004. This deadline was later extended to 2006. In essence, it pressured other countries to follow the lead of the Department of Homeland Security and the State Department in adopting e-passports with embedded RFID technology.

2002 The Federal Information Security Management Act (FISMA), enacted December 17, permanently authorized and strengthened the information security program, evaluation, and reporting requirements of federal agencies.

2002 The Dot Kids Implementation and Efficiency Act, passed December 4, created a new domain similar to .com and .edu. The .kids domain was to be a child-friendly space within the Internet. Every site designated .kids would be a safe zone for children and would be monitored for content, for safety, and all objectionable material would be removed. Online chat rooms and instant messaging were prohibited unless they could be certified as safe. The Web sites under this new domain would not connect a child to other online sites outside the child-friendly zone.

2002 The Electronic Government Act of 2002 was passed by Congress on November 15 and signed by the President on December 16. The act was sponsored by Senator Joe Lieberman (D-CT) and was intended to promote e-government in all federal agencies. In essence, the EGA formalized much of what had been done by the OMB's Associate Director for IT and E-Government.

- The EGA established an Office of Electronic Government within the Office of Management and Budget. The head of this office was to be appointed by the president and report to the OMB director. In essence, this formalized the administrative setup established by the OMB, in 2001, under Mark Forman, making the OEG head the federal CIO and

the new Office of Electronic Government the overseer of setting cross-agency standards, including privacy standards, and assuring new e-government initiatives were cross-agency in nature. As such, the EGA represented a direct attack on the agency-centric "stovepipe" approach to IT of prior years.

- The EGA required regulatory agencies to publish all proposed rules on the Internet and to accept public comments via e-mail as part of "e-rulemaking."
- All information published in the *Federal Register* was now to be published on the Web also.
- The federal courts were required to publish rulings and other information on the Web.
- Privacy protections were added, prohibiting posting of personally identifiable information. Privacy notices are required, codifying a three year old OMB directive to agencies.
- The EGA also promoted better recruiting and training of federal IT officers. Each agency head was required to establish an IT training program. Public-private employee exchange programs were also authorized.
- Share-in-savings IT contracting was authorized and Federal Acquisition Regulations (FAR) was changed accordingly.
- Common standards for GIS information were mandated.
- The OMB's prime role in overseeing IT security was reaffirmed to be coordinated with the NIST's role in setting security technical standards.
- The EGA authorized $45 million available to the OMB for e-government projects in the current FY 2003, $50 million in FY 2004, and $250 million in each of FY 2005 and 2006. However, actual appropriations deleted $40 million of the authorized $45 million, forcing the OMB to implement e-gov strategy from mostly departmental budgets. Subsequent appropriations were also far lower than originally planned.
- The GSA was also authorized $8 million for digital signatures and $15 million for maintenance and improvement of FirstGov.gov and other portals. FirstGov.gov will be improved by adding a subject directory so pages can be accessed by topic rather than by agency.

2002 Regulation.gov was launched as a new one-stop Web portal in late 2002 as part of Bush administration e-government initiatives. It was designed to encourage citizens to participate in Federal rulemaking. On this site, one can find, review, and submit comments on Federal documents that are open for comment and published in the Federal Register. The uniform resource locator (URL) is http://www.regulations.gov.

2003 President Bush dissolved the Critical Infrastructure Protection Board on February 28, placing its function in the new Homeland Security Council, which is charged with coordinating cybersecurity policy. Early strategy emphasized public and private sector best practices and downplayed enforcement of security policies.

2003 The OMB announced "Round 2" of its e-government initiatives in March, looking beyond the earlier 24 "Quicksilver" initiatives. Round 2 focused on data and statistics, criminal investigations, financial management, public health monitoring, and monetary benefits to individuals. The OMB sought to force joint projects (e.g., Justice, Treasury, and EPA to have one criminal investigation system instead of three separate ones).

2003 The OMB required privacy assessments as part of the FY 2005 budget process for the first time. Agencies were required to submit privacy assessments of major IT systems as part of their annual business case submissions. This implemented privacy provisions detailed in the E-Government Act of 2002, which included privacy assessments and Web site privacy statements.

2003 Funding of e-government initiatives for FY 2004 was cut to $1 million, far short of the $50 million over five years as initially announced. OMB's head of the Office of Electronic Government, Mark Forman, quit, departing for the private sector. Future growth of e-government was called into question, at least temporarily.

2003 The Check Clearing for the 21st Century Act passed in October, allowing the substitutability of electronic images of checks for physical transfer of printed checks among banks. It did not mandate electronic check clearance but made it legally equivalent.

2003 The 2003 Amendment to the Fair Credit Reporting Act strengthened laws to prevent identity theft, improve resolution of consumer disputes, improve the accuracy of consumer records, make improvements in the use of, and consumer access to, credit information, and for other purposes.

2003 The Controlling the Assault of Non-Solicited Pornography and Marketing Act (CAN-SPAM) was passed in December, giving the Federal Trade Commission, state attorneys general, and ISPs the power to enforce rules requiring senders of marketing e-mail to include pornography warnings, to offer opt-out methods, and to not use false or deceptive information in e-mail subject lines. The law became effective January 1, 2004, and authorized the FTC to impose fines up to $250 per e-mail, with a cap of $2 million for initial violations and $6 million for repeat violations (these caps do not apply to e-mail using false/deceptive subject lines). There were also criminal penalties including up to five years of prison. The FTC was mandated to develop a plan for a national do-not-spam registry and is authorized to launch the list after filing its report. Although CAN-SPAM led to some high-profile convictions of spammers, by 2008 the level of Internet spam had grown ten-fold and was estimated to cost ISPs and corporations over $40 billion annually, leading many observers to judge the act a relative failure.

2003 The Medicare Prescription Drug Improvement and Modernization Act of 2003 established a prescription benefit for Medicare to start January 1, 2006, which in turn required a massive IT effort to administer since millions of senior citizens were to be served. Led by CMS (Centers for Medicare and Medicaid Services), the government worked with 10,000 partners to establish a drug card based on over a hundred privately provided plans. The IT component had to collect data on drug claims, reconcile them for appropriateness, and manage fraud and abuse. A single vendor, AT&T Global Networking Services, was used for data connectivity.

When implemented in 2005–2006, there were major transitional problems including glitches in the software for plan selection and enrollment, rejecting coverage of medicines needed by elderly patients, and the lack of reimbursement for purchases. By January, 2006, Pennsylvania and eight other states had felt compelled to mount efforts to assure their citizens were not overcharged or deprived of Medicare benefits.

2005 The Real ID Act of 2005 was a Bush- and Republican-sponsored bill passed largely along party lines and largely without debate in Congress or much attention from the media. It was embedded in an emergency military appropriations bill for Iraq to make it hard for opponents to vote against it. Its purpose was to establish and rapidly implement regulations for state driver's license and identification document security standards. It compelled states to design their driver's licenses by 2008 to comply with federal antiterrorist standards. Federal employees would then reject licenses or identity cards that did not comply, which could curb Americans' access to airplanes, national parks, federal courthouses, Social Security,

and even opening bank accounts. The act came close to being a national ID card and to taking effect in 2008, but soon gave rise to strong state resistance over cost and implementation issues, eventually raising questions about whether it would be implemented in whole or part by the new Obama administration. The original legislation gave HSD authority to specify standards, which could include biometrics (fingerprint, iris scans), RFID tags, and DNA information in addition to basic identity information and a digital photo. State DMVs were to require much more identification than in the past (another unfunded mandate to the states). The Real ID Act could engender creation of a massive national database on individuals, though there is still a chance the Real ID cards will only be checked locally on an individual basis (e.g., does the cardholder have the fingerprints the card says they have). If there is to be such a database, and who will have access to it, including commercial access, was not spelled out.

2005 The Family Entertainment and Copyright Act of 2005 provided further protection for intellectual property, criminalized having pre-release media files on one's computer, strengthened law enforcement powers over Internet bootlegging of counterfeit media and sharing of pirated media, banned using camcorders in movie theaters, but specifically did not include any new criminal penalties for file sharers, meaning that publishers must still prove "willful intent to violate copyright" in order to obtain convictions. This left consumers still free to use devices like ClearPlay to make movies "family friendly" by automatically skipping over violence, sexual situations, and advertisements.

2005 The Junk Fax Prevention Act of 2005 legalized spam faxes and put the burden on consumers to get off of spam lists; the act exempted businesses from previous FCC regulations barring unsolicited fax messages if they had prior business relationship with the recipient (FCC rules had required expressed written consent). Recipients were guaranteed "a clear and conspicuous notice on the first page" explaining how to get off the fax mailing list.

2005 The Patient Safety and Quality Improvement Act of 2005 created a national database on patient safety, including doctor errors. The act gave legal protection to health professionals who reported their practices to patient safety organizations. The Act had been introduced in response to the Institute of Medicine's 1999 report, "To Err is Human." In that report, it was disclosed that approximately 98,000 patients die each year as a result of medical errors. Under privacy protections of the bill, patient safety databases were exempted from federal, state, or local civil, criminal or administrative subpoena; would not be subject to discovery in federal, state or local civil, criminal or administrative proceedings; and could not be disclosed under the Freedom of Information Act or any other similar law.

2005 The National All Schedule Prescription Electronic Reporting Act of 2005 (NASPER) followed a model from Idaho under which grants were given to states to establish a uniform electronic database for reporting controlled substances. Some 20 states already had prescription monitoring plans (PMP) at the time of passage of NASPER, which took a state-based approach, authorizing $60 million for FY 2006–2010. NASPER's purpose was to curtail prescription drug abuse by users who go "doctor shopping" to get drugs from multiple doctors. Medical lobbies were successful in rejecting language, which would have required law enforcement access without a court finding of probable cause.

2006 The USA Patriot Act Amendments of 2006 (Public Law 109-178) clarified that individuals who receive FISA orders (e.g., librarians) can challenge nondisclosure requirements, that individuals who receive national security letters are not required to disclose the name of their attorney, and that libraries are not wire or electronic communication service providers unless they provide specific services and for other purposes. Introduced by Senator John

Sununu (R-NH), the bill defended the position of the American Library Association and civil libertarians.

2006 The red-green-blue rating system employed by the OMB to rate federal agencies on e-government and the other four initiatives of the President's Management Agenda of 2001, mentioned on page 52 of the first edition, was deemphasized by the OMB in 2006. Among the reasons cited was that this rating system distracted both agencies and decision-makers, including the president, from a focus on achieving agencies' goals and missions. Lower ratings (red and yellow) also called attention to administration shortcomings and failures and created morale problems in the agencies affected, which often disagreed with the meaningfulness of the ratings.

2006 The GSA Modernization Act of 2006 merged the Federal Technology and Federal Supply services into the Federal Acquisition Service and merged the Information Technology Fund and General Supply Fund into the Acquisition Services Fund. A major objective of the mergers was to remove acquisition obstacles for departments wishing to buy IT "solutions," such as enterprise systems consisting of a mix of hardware, software, and support services, rather than simply purchase computer hardware or other discrete items, toward which the old form of GSA organization was oriented.

2006 The Federal Funding Accountability and Transparency Act of 2006 mandated that the Office of Management and Budget establish a Web site gateway to a searchable online database of all federal grants, subgrants, loans, contracts, awards, cooperative agreements, and other forms of financial assistance. Passed with bipartisan support, the legislation was designed to make federal spending transparent and accessible. Previously, there had been no single way to search for the disposition of federal spending.

2006 The USA Safe Web Act of 2006 (Public Law 109-455) was an amendment to the Federal Trade Commission Act of 1914. It increased the powers of the FTC to pursue distributors of spyware, spam, and other Internet threats to consumers.

2006 The Adam Walsh Child Protection and Safety Act of 2006, while not limited to online issues, established a searchable Internet-based national database of sex offenders and offenders against children; gave social service agencies online access to national databases on sex crimes against children; increased penalties for child pornography; increased record-keeping requirements for digital images of actual or simulated sexual acts, with penalties for noncompliance; funded online child safety programs; and in Title VII (the "Internet Safety Act"), increased criminal penalties for participation in an enterprise involving child exploitation and prohibited the embedding of deceptive words or images on a Web site to deceive an individual, including a minor, into viewing obscene material. Other provisions significantly increased the number of federal agents devoted to enforcement of child pornography and other crimes against children. In January, 2007, it was announced that states which did not bring themselves into compliance with the act would face cuts in federal funding.

2006 The Unlawful Internet Gambling Enforcement Act of 2006 made it illegal and imposed penalties for financial institutions and credit card companies to process payments related to settling Internet bets.

2006 The Tax Relief and Health Care Act of 2006 included research and development tax credit allowing companies to deduct a portion of money they invest in technology and innovation.

2006 The National Integrated Drought Information System Act of 2006 established the National Integrated Drought Information System to collect data as part of a drought early warning system.

2006 The Health Information Technology Promotion Act of 2006 created the position of the National Coordinator Office for Health IT, and mandated the development and implementation of a national interoperable health IT infrastructure.

2006 The Veterans Benefits, Health Care and Information Technology Act of 2006 required that the Veterans Affairs Department protect the privacy of veterans' personal information, including fraud alerts, data breach notification and analysis, reports to Congress, credit monitoring, and identity theft insurance. The act also funded the Information Security Education Assistance program to provide incentives allowing Veterans Affairs to recruit skilled IT personnel.

2006 The Telephone Records and Privacy Protection Act of 2006 created penalties to attempt to stop the public disclosure of personal phone records. Such disclosure had been widespread, based on professional "pretexters" who obtain commercially available personal information (address, mother's maiden name, Social Security numbers, etc.) and use these data to impersonate an individual and request a copy of phone records from telephone companies for resale to clients who request it. A secondary method of disclosure has been profiteering by telephone company employees who sell telephone records for personal gain. The bill imposed up to 10 years in jail and up to half a million dollars in fines for knowingly transferring private phone records to unauthorized persons.

2006 In 2006, states began passing identity theft/data breach protection laws. Among the first was Hawaii, which passed three acts for respectively providing notification of consumers regarding security breaches, requiring those businesses and government agencies responsible to have "reasonable" protections against data theft, and allowing victims of identity theft to place a security freeze on their credit reports so as to prevent thieves from taking out loans in their names.

2007 In January 2007, FirstGov.gov announced that it had changed its name to USA.gov. The change came after the GSA, which administers the nation's premiere portal, found that in the previous year, some 600,000 Americans had entered "usa.gov" when looking for federal information while not having been aware of the "FirstGov.gov" address.

2007 The Legislative Transparency and Accountability Act of 2007 (Public Law 110-81) was passed overwhelmingly (96:2) in the U.S. Senate in January, 2007. It mandated creation of a searchable Web site for data on congressional travel and also called for expanded Internet publication of Senate proceedings, conference reports, committee hearings, and proposed text of legislation.

2007 The Open Government Act of 2007 (Public Law 110-175) strengthened the Freedom of Information Act by requiring agencies to make information available online more fully. Agencies were required to establish individualized tracking systems for FOIA requests. The act also defined "members of the news media" more broadly to include blogs and similar news Web sites, at least for blogs of established news organizations. Also, the act clarified that when information services and databases are contracted out, FOIA still applies. Finally, Section 10 of the act established the Office of Government Information Services within the National Archives and Records Administration to function as ombudsman and to review agency FOIA policies and procedures, and recommend changes. Unfortunately, NARA was not given implementation funding for the new office.

2008 The KIDS Act of 2008 (Public Law No: 110-400, also known as "Keeping the Internet Devoid of Sexual Predators Act of 2008"), introduced in January, 2007, by Senators Charles E. Schumer and John McCain, required all registered sex offenders to submit their active e-mail addresses to law enforcement so that they may be entered into a registry which social e-networking and other organizations may check in order to protect their members.

2008 The Prioritizing Resources and Organization for Intellectual Property Act of 2008, introduced in the Senate (S. 3325) by Sen. Patrick Leahy (D-VT), became Public Law 110-403. In addition to numerous provisions broadly applicable to all types of intellectual property, whether or not computer-based, its Section 403 specifically authorized additional funding for the Department of Justice "to investigate and prosecute intellectual property crimes and other criminal activity involving computers." The bill also created an "Intellectual Property Czar" ("Intellectual Property Enforcement Coordinator"), whom critics feared would exercise a heavy hand in restricting Internet freedom through lawsuits the "czar" was authorized to initiate on behalf of the government.

2009 As this article is written in the first two weeks of the 111th Congress, these computer- and Internet-related bills have already been introduced:

- The Permanent Internet Tax Freedom Act of 2009, introduced in Senate (S43) by Sen. John Ensign (R-NV) , was intended to make the federal moratorium on Internet access taxes and multiple and discriminatory taxes on electronic commerce permanent.
- The Online Job Training Act of 2009, introduced in House (HR 145) by Rep. Rush Holt (D-NJ), was proposed to amend the Workforce Investment Act of 1998 to include workforce investment programs on the Internet.
- The Prescription Drug Affordability Act of 2009 (HR 163), introduced in the House by Rep. Ron Paul (R-TX), would amend the Internal Revenue Code and the Federal Food, Drug, and Cosmetic Act to remove barriers for and reduce taxes on retired individuals who import prescription drugs via Internet sites. Similarly, the Pharmaceutical Market Access Act of 2009, introduced in the Senate (S 80) by Sen. David Vitter (R-LA), also sought to reduce barriers to importation of prescription drugs via the Internet.
- The Transparency in Corporate Filings Act, introduced in the House (HR 281) by Rep. Peter Roskam (R-IL), would authorize the Securities and Exchange Commission (SEC) to permit or require persons securities filing information to be made available on internet Web sites and not just written filings to the SEC.
- The Voting Opportunity and Technology Enhancement Rights Act of 2009 was introduced in the House (HR 105) by Rep. John Conyers (D-MI), and it would mandate each State to establish a program under which individuals may access and submit voter registration forms electronically through the Internet. In addition, the bill would set standards for electronic voting software.
- The Notify Americans Before Outsourcing Personal Information Act of 2009, introduced in the House (HR 427) by Rep. Ted Poe (R-TX), would prohibit the transfer of personal information to any person or business outside the United States without notice.
- HR 230 was a bill "to require certain warning labels to be placed on video games that are given certain ratings due to violent content" and was introduced in the House by Rep. Joe Baca (D-CA).
- The Health Information Technology Act of 2009 was introduced in the Senate (S.179) by Senator Debbie Stabenow (D-MI) and was intended to improve quality in health care by providing incentives for adoption of modern IT.

2009 In addition, some bills, which died in the 110th Congress (2007–2008) without being enacted into law, may still be taken up by the 111th Congress (2009–2010) and the Obama administration. These include:

- The Voter Confidence and Increased Accessibility Act of 2007 would have required electronic voting systems to be designed to provide a paper trail of recorded votes and more.

- The Global Online Freedom Act of 2007, sponsored by Rep. Chris Smith, would have prohibited Internet companies from cooperating with repressive regimes that restrict Internet access to information about human rights and democracy and that use IP addresses or other personally identifiable information to punish pro-democracy activists. Specifically, Internet companies would have been prohibited from turning over personally identifiable information to such regimes.
- The Internet Freedom Preservation Act of 2007 was introduced to prohibit Internet and broadband service providers from offering preferential treatment to certain classes of customers. It reflected the goal of maintaining "net neutrality," which presently makes the Web site of a small organization about as accessible as the Web site of a large corporation.
- The Deleting Online Predators Act (DOPA), first approved in the House in 2006, would have banned children from using or viewing blogs and social networking sites in schools and libraries. DOPA was again proposed in 2007. The Center for Democracy and Technology is among those opposing DOPA, calling it unconstitutional and ineffective, and urging instead to educate children about safe Internet use. Another provision of DOPA would have required mandatory labeling of certain Web sites as containing "sexually explicit" content. The Center for Democracy and Technology has noted that such legislation has repeatedly been voided in the courts as unconstitutional.
- The NSA Oversight Act of 2007 reiterated that chapters 119 and 121 of title 18, United States Code, and the Foreign Intelligence Surveillance Act of 1978 are the exclusive means by which domestic electronic surveillances may be conducted, as well as for other purposes. That is, the act sought to reaffirm the exclusive role of the FISA courts in approving wiretaps. Other proposed reforms included requiring similar court approval for National Security Letters, which can also compel disclosure of sensitive information. Sponsored by Rep. Adam Schiff (D-CA), the bill was a repudiation of aspects of the Bush administration information policy.
- The Federal Agency Data Mining Reporting Act of 2007, also known as the Feingold-Sununu bill, would have increased the role of Congress in overseeing information sharing and data mining in the federal government
- The Congressional Research Accessibility Act of 2007 would have mandated the Congressional Research Service to make its reports available on the Web.
- The Identification Security Enhancement Act of 2007 would have repealed the Real ID Act in favor of a more limited approach to standardizing state drivers' licenses without creating centralized, national ID databases.
- The Free Internet Filing Act of 2007 would have provided for direct access to electronic tax return filing, a potential IRS service opposed by the private tax preparation industry.
- The Telework Enhancement Act of 2007, introduced by Senator Ted Stevens (R-AK) and Senator Mary Landrieu (D-LA), would have required all federal agencies to appoint a full-time senior-level employee as a telework managing officer.
- S.2661, sponsored by Senator Olympia Snowe (R-ME), sought to prohibit the collection of identifying information of individuals by false, fraudulent, or deceptive means through the Internet, a practice known as "phishing," and to provide the Federal Trade Commission the necessary enforcement authority.

II

POLICY ENVIRONMENTS AND ISSUES

Chapter 3

Tide of Security Secrecy, Tide of Transparency: The G.W. Bush and Obama Administrations, 2001–2009

Jeremy R. T. Lewis

CONTENTS

3.1 Introduction

George W. Bush's two administrations were characterized by national security issues, intertwined with issues of invasions of privacy and partial restrictions of open government legislation. His vice president, Richard Cheney, a leader in both of these policy areas, is considered the most influential vice president in U.S. history. G.W. Bush can claim to have directed the most information-conservative administration of the past 60 years, exceeding those of previous Republicans Eisenhower, Nixon, Reagan, and G.H.W. Bush. The Obama administration immediately laid its claim to being the most information-liberal administration, exceeding in its first months those of previous Democrats Kennedy, (a reluctant) Johnson, Carter, and Clinton. Therefore, at first sight, this was the sharpest, most polarized transition between official information regimes since the first agitation for freedom of information in the United States in the 1950s. We shall briefly examine the actions affecting the official information policy of both administrations along with reactions to them from the open government community. But first, we shall briefly summarize the history of the development of the freedom of information movement in the United States, occurring in decade-long policy cycles from 1955–2000 [see Lewis 1995, 2000a, and 2000b].

3.2 A Brief Survey of Federal Information Policy before 2000

Federal official information policy has developed primarily since the Administrative Procedures Act of 1946 (which mandates public notice and comment periods, appellate, and other quasi-judicial forms of administration). Amending its section 3 is the Freedom of Information Act (FOIA), primarily known for requiring the release of records once they are requested by the public, with extension by other, lesser legislations such as the Privacy Act, Sunshine Act, and Advisory Committee Act. The Copyright Act bars the U.S. government (unusually among developed states) from copyrighting documents prepared at public expense. Despite codification, these statutes do not harmonize in language, nor are they limited to narrow categories of records. This area of policy, therefore, has been highly litigious. The FOIA alone accounted for 3,000 lawsuits by 1990, two dozen Supreme Court opinions by 2000, and currently 400 lawsuits a year. (Other information

statutes have produced few requests or lawsuits.) Overall, the history of FOIA and of other lesser legislation on information policy provides the setting for public information systems at the start of the twenty-first century.

The FOIA was conceived in the mid-1950s by a loose coalition of the press and academics with the Moss committee, chaired by a young Representative from California and Sens. Hennings and Long of Missouri. The first policy cycle culminated in the 1966 FOIA, passed by the Democratic majority with Republican help over the resistance of President Johnson, which established the principle (in 5 USC 552 section (a)) of publishing all law and regulations and releasing records upon request from "any person." Section (b) listed nine exemptions, primarily involving national security classified documents and law enforcement documents, plus confidential commercial material and internal deliberative material. Privacy would be protected by segregating portions of records that would have identified individuals.

Initiating a second policy cycle, 1972 House hearings found that, lacking procedural language, the FOIA had had little effect beyond the symbolic. This was remedied in the post-Watergate 1974 amendments, passed by a super-majority over the veto of President Ford on November 21, 1974. These primarily tightened the language of exemptions, particularly for law enforcement, and added procedural requirements. In the late 1970s, President Carter's Attorney General issued a supportive memo, agencies ramped up their FOIA programs, and the first law suits were heard by the courts. It became evident that, while the press lobbied for the FOIA, most of the requests came from businesses contracted with or regulated by federal agencies.

The third policy cycle occurred in the environment of a balance of power between the Republican administration, Republican Senate, and Democratic House. The Reagan administration stepped in during 1982 to obtain a bill protecting the identities of covert intelligence officers, then the 1986 amendments, which compromised over setting fees for businesses at a higher rate than for those disseminating official information to the public (the press and academics, but more contentiously, public interest groups). A minor exemption clause permitted the CIA to also disguise whether it held any records that it was denying.

In the fourth cycle, 1986–1996, the issue of electronic records was explored by subunits of the U.S. House Government Operations Committee and the U.S. Office of Management and Budget, leading to the 1996 EFOIA [Lewis, 2000b]. In 1980–1986, the Senate's policy on public records depended on tension between a subcommittee (of judiciary) on the Constitution chaired by Sen. Orrin Hatch (R-Utah) and that on Technology and the Law chaired by Sen. Patrick Leahy (D-VT). The 1985 U.S. House hearings and report (1986a) combined with OMB Circular A-130 to raise the central questions of electronic information policy for the 1990s. OMB's Office of Information and Regulatory Affairs (OIRA) was granted extraordinary control over executive regulations through the 1980 Paperwork Reduction Act and a Reagan administration mandate to review (as a tight bottleneck) all proposed regulations. OMB's 1985 Circular A-130, The Management of Federal Information Resources, argued for avoiding monopolies of information, for giving value-added resellers a role in the private sector, for the contracting out of databases, and for continuance of inexpensive public access to official records [Sprehe, 1987 and 1988].

The judicial branch gradually was requiring electronic records to be released under the FOIA, giving some prospect of EFOIA without amending the law [Lewis, 1995, pp. 434–435]. The Supreme Court had let stand a decision in *Long v. IRS* [1979] that computer-stored records are still records under the FOIA. Then, in 1980, the Supreme Court had found in *Forsham v. Harris* that records include machine readable materials. Another court in *Yeager v. DEA* [1982] had maintained no distinction between manual and computer storage systems. In 1989, a district court in *Armstrong v. Bush* decided that National Security Council e-mail records were distinct from

telephone conversations, and on remand [sub nom. *Armstrong v. EOP*], it found that digital files contained information not held by hard copy.

In contrast to the Reagan and Bush (41) administrations, the Clinton administration reasserted the principle of open government being tied to new access technology. On February 22, 1993, the Vice President announced creation of the Government Information Locator System (GILS), an Internet index to materials publicly available at agencies. On June 25, 1993, Sally Katzen, of OMB's OIRA, in a revised Circular A-130, announced a policy reversing the Reagan administration's and favoring agency release of electronic information over having private sector contractors do the job. Agencies were requested to integrate CD-ROM and online indexing and publication with hard-copy processes, and to charge only for dissemination, not acquisition cost.

In an October 4, 1993 memo to agency heads, President Clinton encouraged agencies to release more records and in electronic form where available. The Justice Department also revised its guidance toward a more open policy. Janet Reno, Attorney General, in an October 4, 1993 circular rescinding the 1981 Justice guidelines, called for agencies to use broader discretion in releasing records, particularly those falling under the FOIA's exemption for internal memoranda. By 2000, despite efforts to resist the uncovering of a series of corruption and sexual scandal issues involving the Clintons, the open government community was relatively comfortable with the state of official information policy.

3.3 Information Policy in the G.W. Bush Administration, 2001–2005

G.W. Bush's first administration was a play in three acts: the first eight months, a prelude; then two years of reacting to a national security crisis; then a re-election campaign based heavily on a theme of a national security presidency. In the crisis act, there was a widespread support for, or acquiescence in, measures for national security secrecy.

3.3.1 Vice President Cheney's Energy Task Force

From February to May 2001, Vice President Cheney chaired a task force to develop a new energy policy, a situation reminiscent of the controversy over First Lady Hillary Clinton's task force on health care in 1993. For two members of Congress, the GAO routinely requested the roster and minutes of the group. Cheney's counsel, David Addington, denied the request, claiming the GAO lacked authority. Subsequently, public interest groups filed a lawsuit under the FOIA and another (rare) under the FACA; three years later, federal courts upheld the Vice President's office in withholding the records—and rejected the challenge under the FACA. The Supreme Court and District of Columbia Circuit Court both issued opinions, *In Re: Cheney*, 2004–2005. The Vice President argued that they were a special case outside the provisions of the FACA that required balanced membership and public records [Hammitt, 2005a]. The Supreme Court remanded the case to the D.C. Circuit, and, although the groups (Judicial Watch, the Natural Resources Defense Council, and the Sierra Club) obtained most of the records via FOIA requests to the Energy Department, the courts had almost destroyed the FACA [Hendler, 2009a; and Hammitt, 2009].

The political environment was drastically altered on September 11, 2001, by terrorist attacks using passenger aircraft on the World Trade Center towers in New York and on the Pentagon in Washington, D.C. The Bush administration, hitherto little interested in global treaties or foreign policy, was transformed into a national security presidency. With enormous support in Congress,

a war was initiated within weeks against the Al Qaeda and Taliban groups in Afghanistan, and a covert war that embraced many countries. The USA PATRIOT Act (2001) was passed overwhelmingly, giving carte blanche for the anti-terrorist war. Intelligence services and special operators were unleashed, electronic eavesdropping was allowed far more broadly (including domestically, [Risen and Lichtblau, 2005]), and suspected enemy combatants abroad (the exact terminology became contentious) were captured and taken by "extraordinary rendition" to third countries (or Guantanamo naval base) for interrogation as detainees. Videotapes of those interrogations were destroyed after FOIA requests from the ACLU. Roving eavesdropping on telecommunications was permitted to track individuals using multiple connections; "sneak and peek" searches were allowed without prior or post notice; and National Security Letters were used more frequently for FBI searches of records without a court order and with a gag rule on the subjects. Despite some district court opinions striking down particular searches and seizure provisions on Fourth amendment grounds, and attempts in the Senate to moderate some provisions in favor of civil liberties, the Act was reauthorized in 2006.

Although privacy was more directly at issue, this indirectly affected public records policy in many ways. Classified records (exempted from the FOIA, and never ordered released by a court) increased massively. In a minor but symbolic policy change, images of the ceremonial return of servicemen's coffins to Dover Air Force base were no longer released.

While there was almost universal support for this war, the administration soon planned a second war, an invasion and occupation of Iraq, whose dictatorial regime had proven irritating, wealthy from oil, and aggressive toward neighbors. From 2003, this occupation of a large and divided nation proved immensely challenging, and it gradually divided U.S. public opinion. Although it was a successful theme for re-election in 2004, public opinion turned against the war strongly by 2006, and Republicans lost seats in Congress.

The administration was soon entangled in more scandals over secrecy than usual. In the Valerie Plame (2007) affair, the Vice President's assistant, Lewis "Scooter" Libby, was penalized for leaking, in 2003, that the wife of an ambassador who the administration found critical and wished to discredit was a CIA officer. Because she had been an undercover spy, it ended her 20-year career, endangered her agents, and (if intentional) was a potential violation of the 1982 Intelligence Identities Protection Act. Libby's sentence (for a procedural offense) was commuted to a fine by President Bush on July 2, 2007, though he was not pardoned. A pardon [Plame Wilson, 2007, 306 and 388] would have removed the Fifth Amendment rationale for his not testifying to Congress about the affair.

Soon there were more official information issues: the secret legal memos from the Office of Legal Counsel, Department of Justice, that had supported "enhanced interrogation techniques" (allegedly defined as torture under international law and conventions) to be applied to irregular enemy combatants. Secret flights were tracked among eastern European and Middle Eastern countries as suspects were taken for interrogation [Priest, 2005] in places beyond the reach of U.S. constitutional restraints. The justifications for the invasion of Iraq, a program of the imminent development of weapons of mass destruction and links to Al Qaeda, were without foundation. The Supreme Court, with a Republican-appointed majority, ruled against detention without adequate legal rights. As in the contentious Vietnam War period that begat the 1966 FOIA and the Pentagon papers and Watergate era that stimulated the 1974 FOIA, national security secrecy and false official information created demands for more open government.

A center of gravity in the Bush administration was the Attorney General's Office of Legal Counsel, responsible for several memoranda justifying both a reduction of open government and a harsh detention regime for captured enemy combatants.

3.3.2 Attorney General Ashcroft's Memo, October 2001

Attorney General John Ashcroft (2001) continued the tradition of issuing a memo to federal agencies, setting a direction for FOIA processing. The memo removed the "foreseeable harm" test introduced by Attorney General Griffin Bell (in the Carter administration, 1976) and reintroduced by Attorney General Janet Reno (in the Clinton administration, 1993). It also committed the administration to the "fundamental values" of the *exemptions* to the FOIA, and to defending agencies withholding records whenever they found a "sound legal basis." This encouraged agencies [Hammitt, 2003] to withhold records where discretion permitted. The General Accounting office issued a report on September 19, 2003, on FOIA processing under the Ashcroft memo, reckoning that about one-quarter of agencies had made some changes in response to the order [Hammitt, 2003].

3.3.3 Andrew Card's 2002 Memorandum on Protecting Homeland Security Records

Reorganization and creation of the unified Department of Homeland Security, plus a widespread drive to remove any information from official Web sites that could facilitate poisoning water supplies or air with weapons of mass destruction, brought attention to the inability to declare most of this material classified. Posting of records on environmental dangers of many kinds, like other safety data, had been thought beneficial to public health. In spring 2002, the White House Chief of Staff, Andrew Card, issued a memo to agency heads, with advice from the Justice Department and ISOO, to protect Sensitive But Unclassified Homeland Security records via the FOIA's little-used exemption (b)(2) for internal personnel rules and practices, and exemption (b)(4) for confidential commercial information and trade secrets. (Neither one is really suitable for the purpose.)

3.3.4 Bush's Executive Order Restricting the Presidential Records Act

The 1978 Presidential Records Act treated presidents' records as public property, though court challenges and executive orders have reduced the scope of the statute. In 1995, however, a court opinion declared—against counsel for both presidents George H. W. Bush and William J. Clinton—that former presidents yielded control over their papers 12 years after leaving office. In early 2001, White House counsel Alberto Gonzales instructed the Archivist to delay release of President Reagan's files, let alone those of Bush and Clinton. A subsequent November 1, 2001 Executive Order (EO) 13233 revoked President Reagan's 1989 EO 12667 and required approval from the current president for the release of former presidents' records. (President G.W. Bush would therefore be able to protect his father's records.) Furthermore, past presidents and vice presidents could hand down their privileges indefinitely. "It was essentially overturning the Presidential Records Act," said Thomas Blanton, of the National Security Archive [Hendler, 2009a].

3.3.5 The National Security Classification System

Since 2001, more agencies and more officials have been authorized to classify records. By 2007, the Information Security Oversight Office (ISOO) found more than twenty-three million classification actions government-wide—the number having more than doubled since 2000. President G.W. Bush then laid down, by the 2003 executive order, a three-year moratorium on many automatic declassifications, authorized the Director of Central Intelligence to overrule declassifications

by ISOO, broadened classifications for records provided by allied governments, and permitted reclassifications (by claw back) of declassified documents—if they were still retrievable. Prompted by a historian, NARA officials discovered a large quantity of reclassified documents pulled from their public shelves were not in fact so eligible, even under the new EO [Hendler, 2009a; ISOO reports, 2003].

While Congress, vendors, and the open government community were developing the concepts of e-governance, however, the Bush administration was urgently concerned with national security secrecy, the threat of terrorism, the war against Al Qaeda in Afghanistan, and (from 2003) the occupation of Iraq.

3.3.6 President Bush's Executive Order 13292, "Classified National Security Information," 2003

Alternation of party in the Presidency has rendered a pattern of symbolic discouragement of excess classification from Democrats (Carter, Clinton) and encouragement from Republicans (Nixon, Reagan, G.H.W. Bush) under presidential executive orders. Although only some of these orders have much direct effect, they set the tone for an administration, and some of these orders form a substantial change in direction. The March 25, 2003 Bush EO on Classified Information amended the 1995 Clinton EO 12958. Advised ISOO (2003), "The principal purpose of the amendment was to provide agencies with an additional 3 and a half years to address the remaining backlog of unreviewed, 25-year-old classified records of permanent historical value prior to the onset of automatic declassification. The other changes were recommended by a broad consensus of inter-agency professionals in classification and declassification." The backlog stood at 400,000 pages, but the declassification of one billion pages was widely considered successful. Difficult-to-review records were given extensions of three to five years. Criteria for classification were standardized for 10-year and 25-year documents. Unauthorized disclosure of classified information to the public would not result in its being declassified. Defense against transnational terrorism was explicitly included in national security; and weapons of mass destruction were explicitly included in the subject matter of classified material. Although the order ostensibly limited original and delegated classification authority, in practice, the number of officials with derivative classifications was large (well over 100,000) and increasing. The Archivist and ISOO retained formal authority to process the declassification of old records in consultation with the originating agencies. With the experience of 9/11 having shown that local emergency responders could not be given vital information, a new section (4.2(b)) permitted agency heads to share classified information in an emergency with those otherwise ineligible.

The White House background briefing (March 25, 2003) on the new EO emphasized continuity, but responses to journalists' questions indicated some changes: the retrieval and reclassification of wrongly released records; foreign government supplied records that were presumptively to remain classified; materials that were just about to be automatically declassified would be held until 2006 for completion of a review; and the Clinton language for those in doubt, to under classify, had been removed. The Director of Central Intelligence was given specific authority to override the automatic declassification decision in order to protect sources and methods.

3.3.7 Bush Administration's Claims of State Secrets Privilege

The Bush administration increasingly claimed the state secrets privilege: to withhold national security information from the courts. The claim is that the Government cannot explain its side

of the case on account of national security. First recognized in *US v. Reynolds* (1953), invoked only five times by 1970 and fifty times from 1970 to 1994, the privilege was invoked three times in the first W. Bush administration alone, and further in the second [Hammitt, 2005b]. The *Reynolds* opinion argued, "The court itself must determine whether the circumstances are appropriate for the claim of privilege, and yet do so without forcing a disclosure of the very thing the privilege is designed to protect" (345 US 8). However, fifty years later, the daughter of one of the airplane crash victims in the case, Judy Loether, purchased the declassified papers via a third party, only to discover that negligence, not national security, was being covered up. William Weaver and Robert Pallitto, two political scientists, surveyed increasing use of the state secrets privilege and concluded that the courts had "judicially mishandled to the detriment of our constitutional system,'' and "unwisely acquiesced to executive power on this matter" [Dean, 2006].

In *Maher Arar v. John Ashcroft*, Eastern District of New York, a Canadian citizen alleged he was arrested at JFK airport, "renditioned" to Syria for torture, then released as innocent. In *Sterling v. Tenet,* Eastern District of Virginia, appealed to the 4th Circuit, a CIA officer complained of racial discrimination. In *Sibel Edmonds v. Department of Justice*, appealed to the D.C. Circuit, an FBI linguist complained that she was terminated for whistle-blowing problems in the office. The Inspector General's report, in its unclassified portions, largely upheld her complaints about a coworker. An *amicus* brief filed by open government groups argued that the state secrets privilege should not apply to information already public, and that it should not be used before a case in order to forestall litigant discovery [Hammit, 2005b]. In *Khalid El-Masri v. United States* [Dean, 2006], a German citizen was mistakenly arrested and flown to Afghanistan where he was detained, beaten, and tortured by the CIA. Dean [2006] argues, "the paradox of the state secrets privilege is that the government can invoke it without saying exactly why, and many federal judges—and, as noted, government attorneys—have met this invocation with deference, mindful of the constitutional separation of powers." (The 1978 Classified Information Procedures Act, designed to permit trials using classified information with safeguards against disclosure, has long been ignored.)

Mindful of the release of thousands of e-mails from NSC staff in the Iran-contra affair, President Bush's staff routed their e-mail via the Republican National Committee, to avoid open government laws. Nonetheless, the FOIA does not apply to personal presidential staff, only to executive agencies. President Bush, in a humorous speech to the American Society of Newspaper Editors (ASNE) on April 14, 2005, repeated his mistaken claims that his personal e-mail might be subject to the FOIA and Presidential Records Act. "I believe in open government. I've always believed in open government. I don't believe in e-mail, however. And there's a reason: I don't want you reading my personal stuff. I don't think you're entitled to read my mail between my daughters and me" [Hammitt, 2005d].

To assess changes in FOIA implementation in the first G.W. Bush administration, Lacey Phillabaum of the Coalition of Journalists for Open Government [CJOG, 2005a], examined FOIA processing at 22 of the 25 largest FOIA programs in 2000 and 2004. (The other three were omitted as they routinely fulfill nearly all first-person requests, but third-party requests are more of a FOIA processing challenge). She found a 10% decrease in requests but a 13% decrease in those processed—and a substantial drop (96,000) in requests fully granted. The use of exemption (b)(2) tripled, and the use of exemption (b)(5) doubled. The use of exemption (b)(4) increased by two-thirds. Strangely, in the national security crisis, the use of exemption (b)(1) for classified material *decreased* 26%. Use of the (b)(7) law enforcement exemption also *decreased*, although two parts of (7) were used far more often. Costs per request soared with the State Department and CIA being

the most expensive (at $2,500). She concluded there had been a substantial effect of the memos from Attorney General Ashcroft (2001), and White House Chief of Staff Andrew Card (2002).

CJOG [2005b] also examined litigation outcomes in the first G.W. Bush administration. There are over 400 legal decisions per year—less than 2% of the 21,000 formal denials issued annually by the 15 federal departments and 10 of the larger agencies. In 70% of legal cases, the government wins outright, and in only 3% of cases does the plaintiff win outright. Only 18 of 2,460 cases involved the media. Not only is suing prohibitively burdensome and expensive, but since the Supreme Court's 2001 *Buckhannon* decision, fees awarded to prevailing plaintiffs had dropped 90%, from $634,000 to $66,000. Total reported government spending on litigation almost doubled to $18 million but primarily because of a new accounting system. On the bright side, for the open government community, of the dozen cases with media as plaintiffs, the plaintiffs won or settled in three-quarters.

3.4 Official Information Policy in the Second G.W. Bush Administration

3.4.1 President Bush's Executive Order 13392, "Improving Agency Disclosure of Information," 2005

EO 13392 called for improved customer service in processing FOIA requests and designated a Chief FOIA Officer, Requester Service Center, and a FOIA Public Liaison in each agency for efficient compliance and monitoring. The CFOIAO would be expected to review, plan, and report on FOIA compliance. The Attorney General would receive and compile the reports for the President, and the Director of OMB would issue guidance to agencies. Section 7, however, specified that the work was subject to available appropriations and would not create any new right or benefit. The Order took the FOIA community by surprise [Hammitt, 2005e]; it seemed to be derived from the reinventing government strategy of the Clinton administration; it was limited to practices already being implemented; and it may have been intended to pre-empt the stronger provisions of the three Cornyn-Leahy OPEN Government bills in the U.S. Senate. The order did not reverse the Ashcroft memo that had encouraged use of exemptions to withhold records under the FOIA. He suspected that the multiple references to working within existing resources would leave the order with little practical effect.

Bush's EO failed to result in much compliance with the Web publication and indexing requirements of the 1996 EFOIA amendments. Of the 12 worst agency Web sites in a previous National Security Archive [2007] survey, only a third showed significant improvement by its 2008 survey, while 40% made no changes.

The National Security Archive [2008] surveyed major U.S. agencies in 2008, to assess their implementation plans for the 2005 EO. It found mixed results and some substantial shortfalls in the reduction of agency request backlogs. Two hundred thousand requests were still pending (though with great variations among agencies). The order, NSA noted, lacked a funding or enforcement mechanism, and it let the agencies set their own goals.

3.4.2 2005 and 2008 Presidential Memoranda on Sensitive but Unclassified (SBU and CUI) Records

A December 16, 2005 G.W. Bush Presidential Memorandum created a process to standardize an executive branch designation for most SBU information. (The problem had surfaced most

publicly in the 9/11 Commission Report and was part of the issue that led to criticism of the CIA and FBI for not cooperating in anti-terrorism investigations.) A related May 9, 2008 Presidential Memorandum referred instead (more positively) to "Controlled Unclassified Information" (CUI) as the single designation for defined information, including terrorism-related information previously designated SBU. It also established a CUI Framework for designating, marking, safeguarding, and disseminating CUI terrorism-related information; designated NARA as responsible for overseeing and managing; and created a CUI Council to perform an advisory and coordinating role. The process of implementing this across national security related agencies was projected to take until 2013.

3.4.3 Congress Resurges: The OPEN Government Amendments of 2007, PL 110-175

In 2004, Rep. Henry Waxman (D-CA) introduced a house bill, and in early 2005, Sens. Cornyn (R-TX) and Patrick Leahy (D-VT) introduced the OPEN Government bill. Cornyn based his provisions largely on the Texas Public Information statute, familiar to him as Attorney General of Texas. The bill included amendments on time limits, tracking systems, reporting requirements, fees charged, and broadened the definition of the media to include online sources. It also called for the Administrative Conference of the United States (ACUS), which had done work in the 1970s on FOIA, to perform a mediation role [Hammitt, 2005c]. ACUS had previously seen its budget removed during the Reagan administration, and it might not have been a strong agency for the new role; this last provision would be altered over the next two years.

The practice of amending freedom of information legislation about once per decade was continued in 2007, culminating as President Bush signed the OPEN Government Act on December 31, 2007 (the last day available before automatic passage under Art. I, section 7). The House passed its set of amendments (H.R. 1309) on March 14, 2007, and the Senate passed a compromise bill (S. 849) on August 3, which was revised and reintroduced (S. 2488) on December 14, passed the same day, and passed by the House on December 18 [Collaboration on Government Secrecy, 2009]. The full title, perhaps a nod to the clever title of the USA PATRIOT Act, was the Openness Promotes Effectiveness in our National Government Act, PL 110-175.

The two minor provisions for fees had caused the delay in legislative passage. Budgetary rules obliged the House, on December 18, to revise the Senate bill of August 2007 so as to counterbalance for the potential cost of attorney fees and the potential loss of request fees collected by agencies [Hammitt, 2008a; and two brief notes at http://www.accessreports.com/news.html]. Because the U.S. Constitution's presentment clause requires passage of identical bills through the House and Senate, an extra round of floor passage was needed. The House passed (by voice vote) a revised set of FOIA amendments on December 18, shortly after the Senate passed them (by its usual, unanimous consent agreement). The bill was sent to the White House on December 19.

The amendments were directed at refining the implementation of the FOIA. Requesters who substantially prevailed over an official agency in a FOIA suit would again be able to claim attorney's fees (thereby reversing the U.S. Supreme Court's *Buckhannon* opinion, which could have damaged the ability of public interest groups to retrieve some of the costs of their litigation). Secondly, agencies would be prohibited from collecting fees for requests that they did not process within the statute's 20-day time limit. (This might place more symbolic authority on the time limits, which are routinely exceeded in a few agencies with numerous or large requests for records. However, collected fees are a small portion of actual agency costs.) Also established was a requirement for a tracking system for requests (long established in the agencies with larger FOIA programs) to be

published on the World Wide Web; and a codification of the positions of Chief FOIA Officer and FOIA Public Liaisons, which appeared in the Bush executive order of December 2005. The amendments created an ombudsman at the National Archives and Records Administration's Government Services Office and essentially established what bill sponsor Rep. William Clay (D-MO.) labeled as an ombudsman. (*Ombudsman* is a Swedish term for a commissioner who investigates and attempts to resolve disputes between government and public, short of litigation. This is a common practice in other countries with transparency legislation, though not in the United States.) A further provision attempts to clarify the status of media requesters (they have a status that provides reduced fees and potentially faster processing of urgent requests for public import). Finally, the amendments direct OPM to study how to strengthen FOIA as a civil service career path with incentives and recognition [Chan, 2008; Chandler, 2007; Hammitt, 2009].

The provision to establish the Office of Government Information Services (OGIS), within the National Archives and Records Administration (NARA), was diverted by the Bush administration's fiscal year 2009 budget submission to Congress, to the Department of Justice (DOJ). This would mean diverting the office from an office culture of selecting and preserving records for academic historians to one staffed by lawyers defending government agencies from FOIA lawsuits. Whereas NARA's existing Information Security Oversight Office (ISOO) has a record of energetically processing large declassifications, the DOJ's leadership on FOI oversight has been limited to training and a newsletter. On September 17, 2008, the House subcommittee on Information Policy, Census and National Archives, of the Committee on Oversight and Government Reform, conducted a hearing on Implementation of the Office of Government Information Services. OGIS was established in NARA by Section 11 of the OPEN Government Act, 2007. Speakers testified that Congress's designation of NARA as the home for the OGIS was a more functional solution than the administration's designation of DOJ. The chair, Rep. Bill Clay (D-MO), explained [2009, 1] that after nine months and a $1 million appropriation, OGIS had not been established.

Archivist Allen Weinstein hinted at a tension between his personal beliefs and those of the Bush administration, but then he pointed out: "I was one of the first Americans to file, with success, a Freedom of Information Act lawsuit following passage of the 1974 amendments, and, today, I oversee an agency that receives over 1 million requests a year from the public for information" [HRept 110–143, 2009, 8]. NARA had lobbied against being given the OGIS responsibility without specific funding, and he had not begun to establish the office since the 2007 Act [HRept 110–143, 2009, 8]. Thomas Blanton (National Security Archive), describing that as a "shuck and jive and run" strategy, called for an OGIS to be established immediately and instead take the proactive and preventive approach of the US Government Accountability Office. With FOIA requests totalling 21.8 million and appeals at 8,000, OGIS would otherwise soon be overwhelmed [HRept 110–143, 2009, 19]. No sooner had President Bush signed the bill then his staff moved OGIS to DOJ, presenting an inherent conflict of interest. OGIS would need to take full advantage of the experience with the many ombudsmen and FOI commissioners abroad and also those found in the states, New York and Connecticut being successful examples. Transparency and the use of publication and indexing on the internet would be vital [HRept 110–143, 2009, 26].

Patrice McDermott, for a coalition of 70 public interest groups [OpenTheGovernment.org], argued that the 2005 EO on FOIA administration, other than its reporting provisions, lacked meaningful accountability or oversight. "The Department only describes progress at 25 out of 90 agencies that prepared improvement plans … but his graphics showed that only 11 of those 25 agencies met all their self-generated milestones, and that 3 agencies did not meet a single target, that nothing has happened." She concluded [p. 31] that the public access community supports both the compliance and mediation functions of OGIS, but given the limited initial funding of

OGIS, any early investigations and audits would need to be conducted by GAO, as the new statute provided.

Rick Blum, for the Sunshine Initiative [HRept 110–143, 2009, 39] argued OGIS should report directly to the Archivist; its leadership needs a mix of management, legal and mediation experience; and it should ramp up mediation services as soon as possible. Mutchler [HRept 110–143, 2009, 50], a former journalist, a lawyer and FOI ombudsman of Illinois and then Pennsylvania, described FOIA practice as "delay, denial, and dodging," and called for [51] an independent director and commended the independent state commission models of Connecticut, Florida and New York. Weinstein [HRept 110–143, 2009, 60-61] testified to the commitment to declassification and against reclassification at NARA; but Blum [HRept 110–143, 2009, 62] summarized CJOG's criticisms of FOIA processing under the Bush administration,): "a huge opportunity lost."

3.4.4 FOIA Processing: Evaluating Practice under the Second G.W. Bush (43) Administration

A collaboration of open government interest groups, [OpenTheGovernment.org, 2008], produced a "21st Century Right to Know Report," November 2008, which made many recommendations to Congress and to the Obama Administration for fostering a culture that supports openness. The report seemed to be influential with the new administration.

Two transparency nonprofits, OpenTheGovernment.org and the Center for Democracy and Technology, conducted a third five-year survey [2009] of the "most wanted" government documents that should be publicly available but are not. They generally found some progress in "Show Us the Data: Most Wanted Federal Documents," March 2009. The survey was conducted online, with categories seeded from previous surveys and a system of online voting (three choices per visitor, limited by URL); it is subject to the usual problems of respondents not being structured and randomized in unscientific polls. "The executive branch received the most requests for information in this survey," the Report summarized [2009, 5], "but all three branches have the same obligation to share documents and data with the public. Simply put, in order to hold the government as accountable as possible, authoritative and accurate information must be public, and the government must proactively make it available online." This may mark the transition from a lobby focused on opening federal agencies to one concerned with a broader, more active transparency across government branches.

Whereas respondents, whether official or members of the public, in 2004 were principally concerned with security as an excuse or rationale for secrecy, by 2009 they took broader views. "Overall," the report noted [2009, 6], "the Show Us the Data Web site received thousands of visits, more than 200 documents requested and nearly 2,000 votes." The report concluded that there is still a need to implement all the tools of open government, and there is a lack of incentives to do so. The top ten most wanted documents were topped by Congressional Research Service reports, TARP (economic bailout) documents, federal court documents, and federal contractor projects. Strikingly, the list included elements not just from federal agencies (covered by the FOIA), but also from the legislative and judicial branches as well as the states. The report [2009, 7] argued that documents created at public expense in any public institution, should be made available in convenient formats online. It also noted that third-party holdings are still the only choice for some important and widely demanded data, such as congressional voting records.

Relations between the Bush administration and the press, which enjoyed a second honeymoon following the September 11, 2001 attacks, deteriorated sharply, along with the President's public opinion approval ratings in his second term. "The Bush administration has left in its wake a

demoralized national-security press corps, battered by leak investigations, subpoena-happy prosecutors, and a shift in the legal and wider culture away from the previous understanding of journalism's mission and First Amendment protections," wrote Laura Rozen [2009] in a press symposium on openness and secrecy.

A coda to official secrecy of the Bush administration was "Secrecy," a 2008 documentary film that critically examined national security secrecy issues with experts. Overall, journalists and other open government advocates broadly agreed that the G.W. Bush administration offered a more powerful, less accountable theory of presidential government. Not only did the Bush administration take down large quantities of records on infrastructure from official Web sites, undoing much of the EFOIA progress, but the Justice Department, unusually politicized, used the state secrets privilege against revealing information in many court cases, and refused to release the legal rationales for interrogating detainees and eavesdropping on U.S. telecommunications. In addition, writes Hendler [2009a], "The administration and its conservative allies waged a rhetorical war on journalists who worked to learn and disclose the government's secrets."

3.5 Change of Direction in the Obama Administration

3.5.1 Pressures for Change during the Obama Transition Period, November–December 2008

Obama for America's [2008] book of campaign promises and speeches held few hints of proposals on open government. It did, however promise [2008, 16] "On his first day as President, Barack Obama will launch the most sweeping ethics reform in history … [including to] Use the Internet to make government more open and transparent so that anyone can see that Washington's business is the people's business." Further, [2008, 149] "When it comes to the corrupting influence of lobbyists on our politics, sunshine truly is the best disinfectant." In the ethics reform chapter, Obama promises, that having created with Sen. Tom Coburn (R) the "Google for Government Act," which created a searchable database to track federal grants and contracts online, he will [2008, 150] "Create a centralized, online database of lobbying reports, tax earmarks, congressional ethics records, campaign finance filings, and information on how much federal contractors spend on lobbying."

Aided by the early signs of victory during the 2008 campaign, the transparency lobby was active in the transition period of late 2008, seeking to produce policy blueprints for the new administration. Short-term and long term goals were laid down in a long report [2008] by the Right to Know Community, a coalition of numerous groups and individuals. The Sunshine in Government Initiative, representing media groups, issued briefer proposals. The National Security Archive confidently issued its own proposals in the form of ready-made memos for the incipient administration. Repeal of the Ashcroft memo and the EO on the Presidential Records Act were high on the lists; NSA and SGI recommended funding and support for the new OGIS office at NARA, as well as restrictions on new statutory exemptions from the FOIA under its (b)(3) clause. The Archive added an advisory committee to reduce delays in processing. Hammitt [2008b] also urged a statute codifying the "foreseeable harm" test to prevent its being deleted by the next Republican administration.

Executive actions desired by the open government community of the Obama administration [Federation of American Scientists, 2008, 2009c] included restoring the 1995 Clinton administration requirement that agencies that classify information to "establish a Government-wide database of information that has been declassified" [EO 12958, 1995, section 3.8], unfulfilled and deleted

by President G.W. Bush [Executive Order 13292, 2003, section 3.7]. Executive orders or directional memos from senior White House staff can just as easily be reversed by a successor administration, and then-candidate Obama indicated a desire to do that.

3.5.2 The Obama Administration's First Six Months

The open government lobby (both in the United Kingdom and the United States) has long noted that it would have more effect in the first months of an administration before the new officials have taken actions and written memos they prefer to keep from the public.

Among U.S. presidential administrations since 1948 (when the press began to agitate for freedom of information), the Obama administration committed to transparency uniquely early and uniquely strongly. Policy direction came in the form of a Presidential swearing-in statement; a policy directive on freedom of information; a broader statement of the principles of transparency and open government; and a new executive order rescinding an order of President Bush that restricted public access to presidential records.

On his first day in office, January 21, 2009, President Barack Obama [2009a] announced "the beginning of a new era of openness in our country." "For a long time now there's been too much secrecy in this city," he told reporters at a swearing-in ceremony. "The old rules said that if there was a defensible argument for not disclosing something to the American people, then it should not be disclosed" (a paraphrase of the October 2001 policy statement of President Bush's Attorney General John Ashcroft). "That era is now over. Starting today, every agency and department should know that this administration stands on the side not of those who seek to withhold information, but those who seek to make it known," President Obama said.

"I will also hold myself, as president, to a new standard of openness. . . . Information will not be withheld just because I say so. It will be withheld because a separate authority believes my request is well-grounded in the Constitution. . . . Transparency and the rule of law will be the touchstones of this presidency" [Obama, 2009a]. In contrast, neither the Clinton nor the Bush administration had issued FOI policy directives within their first nine months.

Also in the first few days, President Obama issued several new policy statements. A new policy on Freedom of Information [Obama, 2009b] directed, "All agencies should adopt a presumption in favor of disclosure" and called for the Attorney General to develop, in 90 days, new FOIA guidelines accordingly. A broader statement on Transparency and Open Government [Obama, 2009d] directed agencies to "harness new technologies to put information about their operations and decisions online and readily available to the public," and ordered preparation of recommendations for an Open Government Directive. A new Executive Order 13489 [Obama, 2009d] was also issued, rescinding EO 13233 of President Bush (2003) that had restricted public access to presidential records. "In the face of doubt, openness prevails," the President said. This, as with previous memos from Attorneys-General, however, applies only to the limited subset of records that fit grey areas in law and practice. The Secretary of Defense, Robert Gates, a career official held over from the second Bush administration, soon ordered that images of the ceremonial return of servicemen's coffins to Dover Air Force base were to be released where the families of the deceased gave permission.

An early surprise was the Presidential release and posting of the secret legal ("torture") memos from the Office of Legal Counsel, Department of Justice, that had supported "enhanced interrogation techniques" to be applied to irregular enemy combatants. Signed by distinguished counsel (Yoo and Bradbury), these were released on the grounds that since the policy had been discontinued, they could no longer be withheld under the FOIA's deliberative privilege exemption (b)(5).

Images of detainees under stress and abused, subject to an ACLU FOIA suit, were expected to be released shortly, also.

3.5.3 Attorney General Holder's 2009 Memorandum on FOIA Processing

Attorney General Eric Holder, on March 19, 2009, announced a new Freedom of Information Act policy, instructing agencies to "adopt a presumption in favor of disclosure." Attorney General Reno (of the Clinton administration) likewise had ordered disclosure of material where there would be "no forseeable harm." Attorney General Ashcroft (of the G.W. Bush administration) had reversed that standard, encouraging agencies to withhold records where they could legally do so.

It has generally been difficult to find evidence of practical changes wrought by the memoranda on the FOIA of a series of attorneys general, but there are some small signs already in March 2009 of reactions to the Obama administration's policy. David Sobel, counsel to the Electronic Frontier Foundation (EFF), announced four court orders for agencies to stay proceedings pending agency review of the new Holder memo's guidelines. Judge Jeffrey S. White of the Northern District of California granted the EFF motion to stay a proceeding so that the Director of National Intelligence and the Department of Justice could reconsider their denial of requested records, now using the Holder memo's guidelines. Likewise, Judge John D. Bates ordered the Department of Justice "to evaluate whether the new FOIA guidelines affect the scope of its disclosures and claimed withholdings in this case" [Federation of American Scientists, 2009c; EFF, 2009]. Attorney General Holder's subsequent memo (March 19, 2009) rescinded Attorney General Gonzales's memo from the Bush administration, instead announcing, "the Department of Justice will defend a denial of a FOIA request only if (1) the agency reasonably foresees that disclosure would harm an interest protected by one of the statutory exemptions, or (2) disclosure is prohibited by law." It restated familiar principles: "First, an agency should not withhold information simply because it may do so legally. I strongly encourage agencies to make discretionary disclosures of information. An agency should not withhold records merely because it can demonstrate, as a technical matter, that the records fall within the scope of a FOIA exemption. Second, whenever an agency determines that it cannot make full disclosure of a requested record, it must consider whether it can make partial disclosure. Agencies should always be mindful that the FOIA requires them to take reasonable steps to segregate and release nonexempt information" [Holder, 2009]. The rest of the memo, plus the associated Dept of Justice press release [2009] and its explanatory *FOIA Posts* 5 and 8 [2009], essentially restated the familiar themes of freedom of information plus the new language on tracking, reporting, and processing from the OPEN Government amendments, 2007.

This seemed to be a mild change only—less strict on agency withholding than the previous memoranda from Democratic Attorneys General, Griffin Bell (under Jimmy Carter) or Janet Reno (under Bill Clinton). There was no repeat of the language of "a sufficient prospect of actual, demonstrable harm" before withholding was allowed. In the past, analysts found little reported effect on FOIA processing from these Attorneys General's memoranda, but the language is held to be symbolic.

There were early signs that the new policy direction, although clear in principle, would be moderate in practice. For example, on May 13, 2009, President Obama decided against release of some 2,000 further images of the abuse of detainees at numerous locations in the "war on terror," and the U.S. Attorney for the southern district of New York sent a memo to appeal the district and appeals courts' opinions that had upheld the ACLU's FOIA request for those images. The President explained that the effect of release of the images "would be to further inflame anti-American opinion and to put our troops in greater danger." Secretary of Defense Robert Gates confirmed that he

had been persuaded by the commanding officers of the wars in Iraq and Afghanistan [Zeleny and Shanker, 2009; Wilson, 2009; Obama, 13 May 2009; Acting US attorney, SDNY]. The ACLU [2009] said the decision to fight the release of the photos was a mistake; officials had described them as "worse than Abu Ghraib" and their numbers, more than 2,000 images, showed that "it is no longer tenable to blame abuse on a few bad apples. These were policies set at the highest level." Human Rights Watch called it a blow to transparency and accountability [Zeleny and Shanker, 2009; Wilson, 2009].

For another sign of limitations to the new transparency, in mid-January, 2009 even though the 2007 and 2008 intelligence budget numbers had already been officially disclosed, the director of the ODNI Intelligence Staff denied a FOIA request for declassification and release of the 2006 budget total [Federation of American Scientists, 2009a]. The ODNI still argued that disclosure of the 2006 budget would still compromise intelligence sources and methods [Federation of American Scientists, 2009b].

3.5.4 Review (of the Review) of Sensitive but Unclassified Records

On May 27, 2009, President Obama [2009f] issued a memorandum initiating a review of Bush's EO 12958 on national security classification, directed toward: establishment of a National Declassification Center; a review of over classification of documents; a prohibition on reclassification; promotion of sharing classified material among agencies; and security of electronic data. Section 2 initiated a review of the miscellaneous category of Sensitive but Unclassified records (SBU), also known as Controlled Unclassified Information (CUI), to improve sharing of SBU among agencies. It explained: "Because each agency has implemented its own protections for categorizing and handling SBU, there are more than 107 unique markings and over 130 different labeling or handling processes and procedures for SBU information." The memo also constructed a cabinet-level Interagency Task Force on CUI, incorporating the CUI Council set up by the previous Bush memo. The objective was "ensuring that the handling and dissemination of information is not restricted unless there is a compelling need." The Task Force was, within 90 days, to report while balancing the principles of openness; standardizing handling of SBU; and protecting privacy.

3.5.5 Reactions in the Open Government Community to the New Obama Administration's Transparency Posture

The press had felt under siege, in some respects, during the George W. Bush administrations, from intimidation over national security information; from the intensifying competition stemming from the rapid increase in media channels; and from the declines in circulation of print media and in advertising revenue. Economic trouble then closed several newspapers in the recession of 2008–2009, and many print outlets were obliged to rely on online publication for lower costs.

Even when two major exposures of national security programs were made and won Pulitzer prizes, they failed to provoke congressional investigations [Rozen, 2009] along the lines of the 1974 Church Committee. They also did not result in legislation such as the FISA of 1978. Dana Priest [2005] exposed the CIA-run overseas prison network and use of enhanced interrogation techniques. James Risen and Eric Lichtblau exposed the National Security Agency (NSA)'s warrantless domestic eavesdropping program. Instead of angry investigations, as Rozen [2009] noted, "congressional Democrats (including then-Senator Barack Obama) had voted with the majority of

Republicans to pass the new foreign intelligence surveillance law that gave retroactive immunity to the telecommunication companies." Rozen concluded [2009], "The Bush administration has left in its wake a demoralized national-security press corps, battered by leak investigations, subpoena-happy prosecutors, and a shift in the legal and wider culture away from the previous understanding of journalism's mission and First Amendment protections." A 2007 study by The Reporters Committee for the Freedom of the Press had actually found a five-fold increase since 2001 in *subpoenas* seeking information on a media outlet's confidential sources. Dana Priest found [Rozen, 2009] that not only were *subpoenas* hamstringing national security journalists, but also classified briefings to members of congress were inhibiting them from talking about the published articles.

Seymour Hersh, the veteran investigative reporter of the Watergate and Vietnam period, concluded [Rozen, 2009] that the Bush-Cheney White House was "more secretive. They are better, smarter; they do much more stuff and hide behind jingoism," he says. "There's been an incredible diminution of Congress."

Garber [2009] sounded a caution to the optimism of the early Obama administration based on Obama's behavior towards the press from campaign to governance. Team Obama's facility with social networking and other forms of online organization is not matched by their poor record giving daily access to the press, especially on the record. "Indeed, Obama's overall treatment of the press—not just in his general rejection of the day-to-day news cycle, but also in his tendency to shun his national traveling press corps ... —created the impression that its members were, to him, a buzzing nuisance."

David C. Vladeck, a longtime FOIA public interest attorney, who had caucused with transition staff on the new Obama transparency policy, pointed [Garber, 2009] to the significance of the Obama memo compared to the Attorney General's memo: "This is something he wants the next president to have to rescind. He takes this very personally, and he wants his name on this, not Eric Holder's."

Commented the editors [2009] of the *Columbia Journalism Review* on the ease with which Bush reinserted secrecy rules, "Battles were won with brief memos, unilateral executive orders, and signal flags from on high." In addition to echoing the proposals of the sunshine coalition during the transition, they argued that Obama should [control] "pseudo-secrecy" outside of the official classification system; revise outsourcing contracts to ensure openness; support the right of government scientists, experts, and researchers to express their knowledge and opinions; and encourage official publication, including of the current financial bailout data. Argued the 21st Century Right-to-Know Open Government group (2008), "Transparency is a powerful tool to demonstrate to the public that the government is spending our money wisely, that politicians are not in the pocket of lobbyists and special-interest groups, that government is operating in an accountable manner, and that decisions are made to ensure the safety and protection of all Americans."

3.6 Conclusion

In conclusion, both the Bush (43) administrations have a strong claim to being the most information-conservative (or opaque) administration since Eisenhower; and Obama's first few months have a strong claim to the most information-liberal (or transparent). In both cases, official information control (opaque or transparent) was part of the core ideology of the administration and some of its leaders, more so than in previous presidencies.

Transparency traditionally suffers during national security periods, especially during wars; it also tends to flourish in Democratic compared to Republican administrations; and it tends to have

a better chance early in an administration. It also depends on a community of lobbying organizations, which are rarely as luxuriant outside the United States. The open government movement, which had spread laws to 80 countries by the arrival of the Obama presidency, had also developed into an active coalition of some 70 public interest groups by the transition in late 2008.

A leader's own ideology must be counted a factor; President Obama's personal commitment to transparency (contrasted with Vice President Cheney's opposition) will likely offset his need for security secrecy during the continuing war in Afghanistan.

Even though these national security periods (under Eisenhower, Johnson, Nixon, Reagan, and now G.W. Bush) have been followed by open government reactions (under Kennedy, Carter, Clinton, and now Obama)—administrations tend over time to accumulate material they prefer to protect. While the Obama administration came to power with ready-made plans to restore open government policy via speeches, memoranda and executive orders—to an unprecedented degree, and uniquely early—it is also to be expected that, with two continuing foreign wars and the risk of further terrorist outrages, the tide of transparency will likely recede somewhat, as the administration develops material of its own that it wishes to withhold.

References

ACLU et al., v. Department of Defense et aI. 2009. 04 Civ. 4151 (AKH).

ACLU et al., v. Department of Justice. 2009. 05 Civ. 9620 (AKH).

ACLU. 2009. Torture documents released under FOIA. Accessed at http://www.aclu.org/safefree/torture/torturefoia.html

ACLU. 2009. Videotapes depicted use of "enhanced interrogation methods". Accessed at http://www.aclu.org/safefree/torture/torturefoia.html

ACLU. 2009. Justice Department releases Bush administration torture memos; Bradbury and Bybee memos are released in response to long-running ACLU lawsuits. Accessed 16 April 2009 at http://www.aclu.org/safefree/torture/39393prs20090416.html

ACLU. 2009. Released: The Bush administration's secret legal memos. Accessed at http://www.aclu.org/safefree/general/olc_memos.html

Acting U.S. Attorney, SDNY. 2009. Memo via facsimile from acting US Attorney, and two assistant US Attorneys, SD of NY, to Hon. Alvin K. Hellerstein, United States District Court, Southern District of New York. 13 May 2009. Accessed at http://graphics8.nytimes.com/packages/pdf/politics/200905_PHOTO.pdf

Arar v. Ashcroft, 414 F.Supp. 2d 250 (E.D. N.Y. 2006).

Armstrong v. Bush, 721 F.Supp. 343 (D.D.C. 1989).

Ashcroft, John. 2001. US Attorney General's memorandum to department heads on the Freedom of Information Act, October 2001. Accessed at http://www.fas.org/sgp/foia/ashcroft.html

Bush, George W. 2003. Executive Order 13292, Classified National Security Information, March 25, 2003. The text of the order is archived at http://edocket.access.gpo.gov/2003/pdf/03-7736.pdf and at http://fs.huntingdon.edu/jlewis/FOIA/USAgov/BushEO13292natSecClassifnMar03.pdf

Bush, George W. 2005. Executive Order 13392, Improving agency disclosure of information, 14 Dec. 2005. The text of the order is archived at http://fs.huntingdon.edu/jlewis/FOIA/USstatutes/BushEO13392ImproveDisclosure05.htm; a PDF image is found at http://edocket.access.gpo.gov/2005/pdf/05-24255.pdf and is archived at http://fs.huntingdon.edu/jlewis/FOIA/USAgov/BushEO13392improveFOIAdec2005.pdf or http://epic.org/foia/24/appendixe2.pdf

Card, Andrew. 2002. Action to safeguard information regarding weapons of mass destruction and other sensitive documents related to homeland security. Memorandum for heads of executive departments and agencies. With attached advice from ISOO and OIP, 21 March, 2002. Washington DC: USGPO.

Chadwick, Andrew. 2001. Interaction between states and citizens in the age of the Internet: E-government in the United States, Britain and the European Union. Paper prepared for delivery at the 2001 Annual Meeting of the American Political Science Association, San Francisco, August 30–September 2, 2001. Accessed via PROceedings, Political Science Research Online.

Chan, Wade-Hahn. 2008. Bush signs FOIA reform bill, *Federal Computer Week,* 2 January 2008. Accessed at http://fcw.com/articles/2008/01/02/bush-signs-foia-reform-bill.aspx

Chandler, Adam. 2007. A FOIA face-lift, *Federal Computer Week,* 13 August 2007. Accessed at http://fcw.com/articles/2007/08/13/a-foia-facelift.aspx

Cheney, Richard B. 2009. Speech at the American Enterprise Institute on secrecy and national security issues, 21 May 2009.

CJOG (Coalition of Journalists for Open Government). 2005a. When exemptions become the rule: New CJOG study shows how federal agencies use FOIA exemptions to step up the withholding of information. Report prepared by Lacey Phillabaum. Accessed at http://www.cjog.net/ (December 2005)

CJOG (Coalition of Journalists for Open Government). 2005b. FOIA litigation decisions, 1999–2004. Accessed at http://www.cjog.net/ (December 2005)

Collaboration on Government Secrecy (CGS). CGS of Washington College of Law, American University, directed by Daniel Metcalfe. Accessed at http://www.wcl.american.edu/lawandgov/cgs/about.cfm

Dean, John W. 2006. *ACLU v. National Security Agency:* Why the "state secrets privilege" shouldn't stop the lawsuit challenging warrantless telephone surveillance of americans. Accessed 22 May 2009 at http://writ.news.findlaw.com/dean/20060616.html

Department of Justice, U.S. 2009. Attorney General issues new FOIA guidelines to favor disclosure and transparency. Press release, Thursday, March 19, 2009. Accessed 24 May 2009 at http://www.usdoj.gov/opa/pr/2009/March/09-ag-253.html

Department of Justice, U.S. 2009. Attorney General Holder issues new guidelines governing the FOIA, *FOIA Post* 5, 20 March 2009. Accessed 24 May 2009 at Corrected URL: http://www.usdoj.gov/oip/foiapost/2009foiapost5.htm; the AG's memo itself refers incorrectly to FOIApost30

Department of Justice, U.S. 2009. OIP guidance: President Obama's FOIA memorandum and Attorney General Holder's FOIA guidelines: Creating a "new era of open government," *FOIA Post* 8, 17 April 2009. Accessed 24 May 2009 at http://www.usdoj.gov/oip/foiapost/2009foiapost8.htm

EFF (Electronic Frontier Foundation). 2009. Releases on their lawsuits, 23 and 24 March 2009. Accessed May 2009 at http://www.fas.org/sgp/jud/eff032309.pdf ; and http://www.fas.org/sgp/jud/eff032409.pdf

E-Government Act. 2002. Pub.L. 107-347, 116 Stat. 2899, 44 U.S.C. § 101, H.R. 2458/S. 803. Enacted December 17, 2002, effective 17 April 2003.

Editors, Columbia Journalism Review. 2009. Let there be light: How President Obama should reopen our government. Editorial, *Columbia Journalism Review,* 21 January 2009. Accessed at http://www.cjr.org/transparency/

Federation of American Scientists. 2008. *Secrecy News,* 12 November 2008.

Federation of American Scientists. 2009a. ODNI denies release of 2006 intelligence budget figure, *Secrecy News*, Jan 14, 2009, http://fas.org/sgp/news/secrecy/2009/01/011409.html

Federation of American Scientists. 2009b. President Obama declares a new era of openness, *Secrecy News,* Jan 22, 2009, http://www.fas.org/sgp/news/secrecy/2009/01/012209.html

Federation of American Scientists. 2009c. *Secrecy News,* 26 March 2009.

Forsham v. Harris, 445 U.S. 169 (1980).

Freedom of Information Act. 1966, amended 1974, 1976, 1986, 1996, and 2007. 5 USC 552.

Garber, Megan. 2009. Who moved his cheese? There's more to openness than a new web site. *Columbia Journalism Review*, 21 January 2009. Accessed at http://www.cjr.org/transparency/

Galison, Peter and Robb Moss. 2008. *Secrecy.* Documentary film. Accessed at http://www.secrecyfilm.com/; film available from http://www.neoflix.com/store/RED41/

Hammitt, Harry. 2003. GAO report finds Ashcroft FOIA memo had some agency influence. *Access Reports News*. 19 September 2003. Accessed 22 December 2003 at http://www.AccessReports.com/news.html

Hammitt, Harry. 2005a. *Access Reports: Freedom of Information*, 31(1), 12 January 2005: 1–3.

Hammitt, Harry. 2005b. *Access Reports: Freedom of Information,* 31(2), 26 January 2005:1.
Hammitt, Harry. 2005c. *Access Reports: Freedom of Information*, 31(4), 23 February 2005:1–3.
Hammitt, Harry. 2005d. *Access Reports: Freedom of Information*, 31(8), 20 April 2005:1
Hammitt, Harry. 2005e. *Access Reports: Freedom of Information*, 31(24), 14 December 2005:1–3.
Hammitt, Harry. 2008a. Bush signs FOIA amendments, Jan 1, 2008; and Congress passes FOIA amendments, Dec. 19, 2007, *Access Reports News*. Accessed at http://www.accessreports.com/news.html, 9 January 2008.
Hammitt, Harry. 2008b. *Access Reports: Freedom of Information*, 34(21), 12 November 2008.
Harry Hammit. 2009. Current news. *Access Reports: Freedom of Information*. Accessed at http://accessreports.com/news.html, 1 November 2009.
Hendler, Clint. 2009a. What we didn't know has hurt us: The Bush administration was pathological about secrecy. Here's what needs to be undone after eight dark years—and why it won't be easy. *Columbia Journalism Review*, January/February 2009. Accessed 26 May 2009 at http://www.cjr.org/feature/what_we_didnt_know_has_hurt_us.php?page=all
Hendler, Clint. 2009b. Day one: New FOIA rules quick victory for transparency. *Columbia Journalism Review*, 21 January 2009. Accessed May 24, 2009 at http://www.cjr.org/transparency/
Hendler, Clint. 2009c. Parsing Obama on state secrets: Obama promises only "cosmetic changes." *Columbia Journalism Review*, 21 May 2009. Accessed May 26, 2009, at http://www.cjr.org/campaign_desk/parsing_obama_on_state_secrets.php?page=all
Hentoff, Nat. 2008. The Dark Bush Legacy on Secrecy. *Washington Times,* 25 February 2008. Acessed at http://washingtontimes.com/apps/pbcs.dll/article?AID=/20080225/EDITORIAL07/183894758/1013/editorial&template=printart
Holder, Eric. 2009. The Freedom of Information Act (FOIA), Memorandum for Heads of Executive Departments, 19 Mar. 2009. Accessed 24 May 2009 at http://www.usdoj.gov/ag/foia-memo-march2009.pdf; and archived at http://www.fas.org/sgp/foia/ag031909.pdf; and http://fs.huntingdon.edu/jlewis/FOIA/USAgov/
House Hearings 107-184. U.S. Congress. House. 2003. Subcommittee on Technology and Procurement Policy, of the Committee on Government Reform. *Hearings on the E-Government Act of 2002, H.R. 2458 and S. 803*, 18 September 2002. Serial No. 107-184. Washington DC: USGPO. Accessed at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=107_house_hearings&docid=f:86062.pdf
House Report 110–143. U.S. Congress. House 2009. Subcommittee on Information Policy, Census and National Archives of the Committee on Oversight and Government Reform, *Implementation of the Office of Government Information Services.* Hearing, 17 September 2008. Washington, DC.: USGPO. Accessed at http://www.gpoaccess.gov/congress/index.html; and archived at http://www.fas.org/sgp/congress/2008/ogis-hrng.pdf
In Re: Richard B. Cheney, No. 02-5354, US Court of Appeals for the District of Columbia Circuit; *amicus curiae* brief submitted jointly by the American Library Association, the National Security Archive, the Society of Professional Journalists, and OMB Watch, 29 November 2004.
ISOO (Information Security Oversight Office) of NARA. 2003. Revisions to Executive Order 12958 on classified national security information. Accessed 27 May 2009 at http://www.archives.gov/isoo/speeches-and-articles/article-revised-eo12958.html
Lewis, Jeremy RT. 1995. Reinventing (open) government: State and federal trends. *Gov Inform Q* 1995; 12(4):427–455.
Lewis, Jeremy R.T. 2000a. FOIA and the emergence of federal information policy in the 1980s. In G. David Garson (ed.), *Handbook of Public Information Systems*. New York and Basel: Marcel Dekker, Inc.
Lewis, Jeremy R.T. 2000b. Electronic access to public records. In G. David Garson (ed.), *Handbook of Public Information Systems*. New York and Basel: Marcel Dekker, Inc.
Long v. IRS, 596 F.2d 362 (9th Cir. 1979).
Michener, Greg. 2009. Freedom of information legislation and the media in Latin America, FreedomInfo.org, 19 May 2009. Accessed 19 May 2009 at http://freedominfo.org/features/20090519.htm
National Security Archive. 2007. File not found: 10 years after EFOIA, most federal agencies are delinquent, 12 March 2007. Washington DC: National Security Archive. Accessed 19 May 2007 at http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB216/index.htm

National Security Archive. 2008. Mixed signals, mixed results: How President Bush's executive order on FOIA failed to deliver, 16 March 2008. Washington DC: National Security Archive. Accessed 19 May 2009 at http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB246/index.htm

Obama for America. 2008. *Change We Can Believe In: Barack Obama's Plan to Renew America's Promise.* Foreword by Barack Obama. New York: Three Rivers Press.

Obama, Barack. 2009a. Swearing-in remarks on open government, 21 January 2009. Archived at http://www.fas.org/sgp/news/2009/01/obama012109.html.

Obama, Barack. 2009b. Policy statement on Freedom of Information issues, 21 January 2009. Washington, DC: The White House Press Office. Accessed at http://www.whitehouse.gov/the_press_office/

Obama, Barack. 2009c. Memorandum for the heads of executive departments and agencies. Subject: Transparency and open government. 21 January 2009. Washington, DC: The White House Press Office. Accessed at http://www.whitehouse.gov/the_press_office/Transparency_and_Open_Government

Obama, Barack. 2009d. Executive order on transparency and open government, 21 January 2009. Accessed at http://www.fas.org/sgp/obama/presidential.html.

Obama, Barack. 2009e. Remarks by the President on national security, 21 May 2009, at the National Archives. Washington, D.C: The White House Press Office. Accessed at http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-On-National-Security-5-21-09

Obama, Barack. 2009f. Presidential memorandum, 27 May 2009, Classified information and controlled unclassified information. Accessed 27 May 2009 at http://www.whitehouse.gov/the_press_office/Presidential-Memorandum-Classified-Information-and-Controlled-Unclassified-Information/

Obama, Barack. 2009g. Executive Order 13489, Presidential records, 21 January 2009. 74 Fed. Reg. 4669 26 January 2009.

Open Government amendments of 2007, PL 110-175. Openness promotes effectiveness in our national government act.

OpenTheGovernment.org, and the Center for Democracy and Technology. 2009. Show us the data: Most wanted federal documents, March 2009. Washington DC: OpenTheGovernment.org, and the Center for Democracy and Technology. Accessed 24 May 2009 at http://www.openthegovernment.org/otg/TopTenReport.pdf

OpenTheGovernment.org, and other groups. 2008. 21st century right to know report, November 2008. Washington DC: OpenTheGovernment.org.

OpenTheGovernment.org. 2009. "TopTenReport," March 2009. Accessed 24 May 2009, at http://www.openthegovernment.org/otg/TopTenReport.pdf

Plame Wilson, Valerie. 2007. *Fair Game: My Life as a Spy, My Betrayal by the White House*. New York; Simon and Schuster.

Presidential Records Act, 1978. 44 U.S.C. 2201-2207.

Priest, Dana. 2005. CIA holds terror suspects in secret prisons: Debate is growing within agency about legality and morality of overseas system set up after 9/11. *Washington Post*, 2 November 2005, page A01.

Reno, Janet. 1993. Attorney General's memorandum to department heads on the Freedom of Information Act. Accessed at http://www.fas.org/sgp/clinton/reno.html.

Right-to-Know Community. 2008. Moving toward a 21st century right-to-know agenda. Report of a Coalition of Open Government Groups, November 2008. (Proposals for an Obama administration transparency policy.)

Risen, James and Eric Lichtblau. 2005. Bush lets U.S. spy on callers without courts. *New York Times*, 16 December 2005. (Article was held back by the *NYT* for one year, and details were deleted before publication.) Accessed 26 May 2009 at http://www.nytimes.com/2005/12/16/politics/16program.html?_r=1&pagewanted=print

Rozen, Laura. 2009. Hung out to dry: The national-security press dug up the dirt, but Congress wilted. *Columbia Journalism Review*. 21 January 2009 Accessed at http://www.cjr.org/transparency/

Sibel Edmonds v. Department of Justice, No. 04-5286, US Court of Appeals for the District of Columbia; *amicus* brief submitted 19 January 2005.

Sprehe, J. Timothy. 1987. Developing federal information resources management policy: Issues and impact for information managers. *Information Management Review* 2(3):33-41.

Sprehe, J. Timothy. 1988. Interview with the author at the Office of Management and Budget, Washington DC.

Sterling v. Tenet, 416 F.3d 338 (Ct. of Apps., 4th Cir. No. 04-1495, 2005). Accessed at http://www.fas.org/sgp/jud/sterling0805.pdf

United States v. Reynolds, 345 U. S. 1 (1953). Accessed 9 November 2009 at http://caselaw.lp.findlaw.com/scripts/getcase.pl?navby=case&court=us&vol=345&page=1

USA PATRIOT Act. 2001. Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act of 2001. Public Law 107-56; 115 Stat. 272 (2001). Amended or created numerous sections of titles 8, 12, 18, 31, 42, and 50 USC.

White House Office of the Press Secretary. 2003. Background briefing on Executive Order 12958 [as amended by EO]. 25 March 2003. Accessed 27 May 2009 at http://www.fas.org/sgp/news/2003/03/wh032503.html

Wilson, Scott. 2009. Obama shifts on abuse photos: Releasing images of detainee mistreatment would endanger U.S. troops, President says, *Washington Post,* Thursday, May 14, 2009. Accessed at http://www.washingtonpost.com/wp-dyn/content/article/2009/05/13/AR2009051301751.html?nav%3Dhcmodule&sub=AR

Yeager v. DEA, 678 F.2d 315 (D.C. Cir. 1982).

Zeleny, Jeff, and Thom Shanker, Obama moves to bar release of detainee abuse photos, *New York Times,* May 14, 2009. Accessed at http://www.nytimes.com/2009/05/14/us/politics/14photos.html?_r=1&ref=us&pagewanted=print

Chapter 4

From Electronic FOIA (EFOIA) to E-Government: The Development of Online Official Information Services, 1985–2009

Jeremy R. T. Lewis

CONTENTS

4.1 Introduction

Among a few commentators in the 1980s, and among many in the 2000s, questions were raised about whether the computers on which bureaucracies had flourished would, in turn, either improve or actually transform government services to citizens. A number of commentators began to notice that online service was more convenient to consumers, and this would also apply to the public sector.

Open government laws, most of them passed as post-Watergate reforms, had been based on the principles of disclosure of public records (the Freedom of Information Act, 1966 and 1974; the Presidential Records Act, 1978); public notice and comment before rule making (the Administrative Procedure Act, 1946); and open meetings (the Government in the Sunshine Act, 1976; the Federal Advisory Committee Act, 1972). The FOIA itself required (in section (a)) publication of regulations and releases in response to requests from any person of any record not subject to nine exemptions in section (b) [see Lewis, 1995, 2000a]. The main exemptions are for properly classified national security material, specifically conflicting statutes, confidential commercial material, some internal memos, personal privacy, and (under listed circumstances) law enforcement files.

The FOIA, which has spawned legislation in 50 U.S. states and in 80 foreign states, has proved to be the most effective (or burdensome) of these reforms, covering over 100 U.S. agencies and stimulating 400 lawsuits per year. While most agencies have minor FOIA programs, about 15 have voluminous requests and backlogs of processing. In the 2000s, as requests declined, backlogs did not.

The request-and-release function of the Freedom of Information Act could be greatly improved online, but beyond simple serving of pre-packaged documents, e-government could deliver customized services to far more consumers based on dynamic information selected and sorted on demand [see Lewis, 2000b]. More powerful and sophisticated services would be demanded, involving commercially valuable data for businesses, though this would raise the issue of charging fees for service.

Among the more attractive early uses of official Web sites are public relations, tourist booking or promotional services, investment promotional services, and citizen suggestion, comment, or complaint services. Deeper services take longer to develop, given not only tangible factors such as budget constraints, but also intangible factors such as a traditional culture in a bureaucracy. Interest group conflict is variable with the political system; the United States enjoys luxuriant public interest group activity, pressing for open release of official information; however, in other countries such as the United Kingdom, before Mrs. Thatcher, or Austria's corporatist polity, interest groups may function better behind the scenes and consequently have less interest in public delivery of services.

The U.S. government is famously fragmented in its policymaking for which "nobody is in charge." The separation of powers, federal system, differing methods of appointment among U.S. institutions, and the diversity of the U.S. population and organized interest groups, combine to encourage multiple agencies to deliver services separately while challenging coordination. Occasionally, comprehensive bureaucratic reorganizations have attempted to overcome this. Examples are President Truman's reorganization of the Department of Defense; Nixon's creation of the Department of Health Education and Welfare and the Department of Housing and Urban Development; Carter's creation of the Energy Department in the late 1970s; and G.W. Bush's creation of the Homeland Security Department following the 9/11 attacks. These have often been criticized for slow transformations, which can retard policy development.

A second form of reorganization, less comprehensive but also less cumbersome, has been the anointing of a "czar" (an overstated term for coordinator) for one subject over multiple agencies.

Examples have been the director of the war on drugs (1980s) and the Director of Central Intelligence (1947), now topped with the Director of National Intelligence. The common criticism of the "czar" approach is that the office lacks command or budget authority. For EFOIA purposes, the Justice Department's Office of Information and Privacy (later, Policy) played a nominal role in giving advice to agencies from about 1976; in 1986, the Office of Management and Budget (OMB) was allocated a limited role in coordinating fees for service.

4.2 Preparing the Ground for EFOIA

Like its predecessors, the 1996 EFOIA emerged only after extensive investigation, preparation, and compromise. In 1980–1986, the Senate's policy on public records depended on tension between a subcommittee (of judiciary) on the Constitution chaired by Sen. Orrin Hatch (R-UT) and that of Technology and the Law chaired by Sen. Patrick Leahy (D-VT).

Until 1986, the FOIA had been debated quite separately from the automation of federal offices. Then, under Rep. Glenn English (D-OK), a set of 1985 U.S. House hearings and reports combined with the OMB Circular A-130 to raise the central questions of electronic information policy for the 1990s. The House Subcommittee on Government Information (of the Government Operations Committee) held hearings in 1985 on electronic collection and dissemination of information by federal agencies, limited (Report, 1986a, 2, n.1) to databases normally open to the public under access laws. Fearing that electronic data systems would increase agencies' control of government information, the 1986 House report based on those hearings sought to maintain a role for the private sector. The report (Report, 1986a, 1-2) also found, "There is a risk that agencies may be able to exert greater control over information in electronic information systems than is possible with data maintained in traditional, hard-copy formats.…Legal ambiguities, practical limitations, and economic constraints may allow federal agencies to restrict unduly the public availability of government data maintained electronically."

Under the subsequent chair, Rep. Bob Wise (D-WV), the recommendations [U.S. House, 1990b] joined the Paperwork Reduction Bill, which passed the House in 1990 only to fail in the Senate on other grounds, until passage of the provisions in similar form in 1995. The counsel drafting the language [Gellman, 1997, 4] later commented ruefully on the technological obsolescence of the Act: it required public notice before initiation of a new information dissemination product, unfeasible in the era of daily changes of Web home pages.

4.3 The Electronic Freedom of Information Act Amendments of 1996

Public Law 104-231, 110 Stat. 3048, required that all materials required to be published by the FOIA's section (a)(2) that were created after November 1, 1996, be made available to the public within one year via computer telecommunications as well as hardcopy. Lacking an online presence, an agency was required to make published materials available in some electronic form. The amendments also spelled out reporting requirements for all agencies, to be compiled by the Department of Justice (DOJ). The EFOIA also specified processing of requests by determining outcomes within 20 days and introducing multi-track processing so that many small requests would not be backed up for years behind a few large requests. But these are less significant for the purposes of this chapter.

Early assessments of compliance were not promising. Among 135 federal Web sites, OMB Watch [Henderson and McDermott, 1998] found 57 lacked an EFOIA presence, and no agency complied with the statute. OMB Watch's follow-up study [Henderson and McDermott, 1999; and House Hearing on EFOIA of 1996, 1998] still found no example of an agency fully in compliance. Halstuk [2000] came to similar conclusions. In 2000, a court agreed with Public Citizen that a set of agencies including OMB were not in compliance with the FOIA's (g) requirement to publish indices and descriptions of major records systems *[Public Citizen v. OMB,* 2000]. Further, it agreed that the EFOIA's notion of major information systems exceeded OMB's, which had been based on the Paperwork Reduction Act. Listing whole systems on the Government Information Locator service (GILS) was insufficient.

Given that courts had already begun to insist that agencies make records available in more convenient formats—even the CIA had agreed with the National Security Archive [Walters, 1988] that jumbled printouts of databases were insufficient—some of the longtime open government experts were not necessarily sure that EFOIA was necessary [Goldman, 1988; Gellman, 1996a, 1996b and 1997].

The General Accounting Office (GAO, later renamed the Government Accountability Office) gave a five-year report to both the House and Senate FOI subcommittees in 2001. The investigators interviewed headquarters officials at six agencies with large FOIA programs, and two with large backlogs; they also met with leading public interest group counsel. The 25 agencies in 1999 processed nearly 2 million requests, releasing records fully in 82% of cases. About 1.6 million requests were processed with a median time of 20 days while 10% of requests were processed in median times of over 20 days. The investigators did not attempt to verify data, nor did they search agency components. They found that all 25 agencies that were targeted had established the required electronic reading rooms, and the DOJ had implemented the requirement for annual workload reports. However, they also found that not all required documents were available on the sites, and the workload reporting data were of limited usefulness. Of the required types of online records, the Energy Department and Environmental Protection Agency were missing administrative staff manuals; State and Treasury were missing final opinions; and the EPA and FEMA were missing frequently requested records and their indexes. Several agencies were missing information on multi-track processing and expedited processing. All agencies had a FOIA Web page, a search feature, information on public services, and links to component units. However, only half of the agencies had the ability to process FOIA requests online.

In FOIA processing, 8 of the 25 agencies (or at least a component) had adopted FOIA application software for scanning and imaging, workflow tracking, and documents management. Along these lines, the U.S. Congress sought in 2002 to coordinate e-government services.

4.4 The E-Government Act of 2002

Public Law 103-347, now 44 USC 101, was passed December 17, 2002, and became effective April 17, 2003. It was intended to both manage and promote electronic government services by establishing a Federal Chief Information Officer within the Office of Management and Budget, and by establishing a framework of measures that require using Internet-based information technology to improve citizen access to government information and services. The Lieberman bill, S. 803, won unanimous consent in the Senate on June 27, and a hearing was held on the House bill on September 18, 2002.

Some practical considerations emerged from the House Hearings (House Hearing 107-184, 2003) on the E-Government Act of 2002. The OMB supported the bill, except for Senate confirmation of the chief information officer, which would slow down the process. The GAO lauded the Information Security Reform Act, reinstated by the bill, thereby promoting security along with privacy. Because the new Office of Electronic Government within OMB would not be integrated with the OIRA, GAO suggested a single Federal Chief Information Officer.

The E-Government Administrator, OMB, framed the issues in the familiar terms of reinventing government: "For the e-government initiative, the strategic question that we face is how to maximize results from the more than $50 billion we invest annually in IT" to make government more citizen-centered and results-oriented [Forman, House Hearing 107-184, 2003]. He reported on an OMB review of 24 cross-agency e-government initiatives and highlighted portals such as GovBenefits.gov, which accesses "services of 110 government programs from 11 Federal agencies representing more than $1 trillion in annual benefits" [House Hearing 107-184, 2003]. GoLearn.gov, the government online learning center, had "provided a million training courses and e-books to Federal employees since its launch in July"; and the improved FirstGov Web site had been lauded by Yahoo. However, there were six chronic problems: "paving cow paths, redundant buying, inadequate program management, poor modernization blueprints, islands of automation, and poor IT security" [Forman, House Hearing 107-184, 2003].

The House bill encouraged integration of e-government services among U.S. agencies, as well as internal collaboration among agencies for the sake of efficiency and cost reduction. Among its purposes was to provide citizen-centric information and services, and to make the federal government more transparent and accountable, yet remain consistent with existing information laws guarding privacy, security, records retention and access for those with disabilities. Overall, it sought greater compliance with the Federal Records Act with respect to electronic records.

An interesting feature was the judicial section (205), which required federal courts to provide greater access to judicial information over the Internet and amended existing law regarding the fees that the Judicial Conference prescribes for access to electronic information to read, "[t]he Judicial Conference may, only to the extent necessary, prescribe reasonable fees for collection by the courts for access to information available through automatic data processing equipment" [Open The Government, 2009, 16-17].

4.5 From EFOIA to E-Governance

EFOIA is a limited concept, conveying to the public digital records (reproducible documents and images of any kind) held by government upon request and publishing these documents via the Web. At a minimum, it requires an index linked to scanned documents, usually with searchable text in parallel with images of the formatted, paginated text. (A common solution in the 1990s and 2000s was to place the SGML or XML tagged text on a WAIS server, with graphics in tagged image file format [TIFF].) Tags provide cross links between text and images. This minimal solution at least enabled educated consumers, commercial services, and public interest groups to add value to the data by manipulating it into reports for their own purposes.

There is obviously a relationship—if an unpredictable one—between publication and the FOIA request-and-release service. Publishing previously-requested records to a self-service Web site (or even to a traditional reading room) could reduce future requests for the same documents (economically, a substitution effect). On the other hand, it could also stimulate requests for further documents referenced by those published materials (economically, an income effect). Publication

to a Web site, compared to a physical reading room, might (by making records available to an unlimited geographic area) greatly speed up both effects.

Sometimes innovation in online records stops at the water's edge of publication. The CIA developed a large, centralized database of redacted, declassified records that is word-searchable and known as the CIA Records Search Tool (CREST). However, digitizing all the records made them accessible only at one location: the National Archives, College Park, MD [Federation of American Scientists, 2009]. In announcing the availability of word searching among records digitized through 2008, the CIA [2009] declined to make them searchable online.

By extension, EFOIA allowed simple manipulation of databases on the Web by a consumer so as to display (and download) the data in a more convenient format (such as a common word-processing or spreadsheet file), a more understandable display (such as a graph instead of a large table) or a more relevant form (such as county data geographically mapped to the counties of a state). The Environmental Protection Agency's (EPA) Toxic Resource Inventory, a list of chemicals held in locations, was ripe for exploitation by the Geographic Information System (GIS), and in the 1990s it was manipulated to display a plume of air pollution from a specified aerial release of chemicals via a specified range of wind direction and speed. Thus government could add value to the data itself for purposes such as citizen education. This, however, might be resisted by the Information Industry Association in the 1980s, during the market-friendly Reagan administration, as competing with the private sector and undercutting the market forces.

But EFOIA is still a limited concept; this would be multiplied and the effects would be even more unpredictable, where a stream of newly generated documents is published to the Web as soon as finalized, without waiting for requests.

The press has occasionally pointed out that e-governance, especially in the form of online video and public releases, can bypass critical journalists and speak directly to the public. "WhiteHouse.gov presents itself as a kind of social networking portal in which citizens can essentially 'friend' the government—and it frames the ensuing dialogue as one that takes place directly between the people and the government," acknowledged Garber [2009]. However, she noticed, "The press, it suggests by way of omission, need not be part of the exchange."

E-government (or more properly, since it refers to dynamic processes, e-governance) seeks an array of services extending far beyond this [Abramson and Means, 2001]. Because most printed documents were from the 1980s and were created on a personal computer or terminal, the intermediate step of printing could be bypassed in favor of direct interaction between the government and the public. As this implies dynamic processes rather than static documents, it could affect the relationship between government and citizen, potentially leading to enhancement of democracy. It could also intensify cross-agency processes of collaboration and data exchange, thereby affecting the relationships among agencies. E-governance could further speed the notice-and-comment function of the federal government, which is required by the Administrative Procedures Act of 1946. In addition, it could facilitate "one-stop shopping," whereby a citizen could access a certain type of service seamlessly from multiple federal and state agencies without being aware of institutional boundaries.

4.6 Technical Possibilities and Issues of E-Governance

For scientific information [National Science and Technology Council, 2009], "digital access has a catalytic effect, multiplying the value of information through repeated use by a wide variety of users in a diversity of settings and applications." As West [2008] points out, "digital delivery

systems are non-hierarchical, non-linear, interactive and available 24 hours a day, seven days a week." Stephen Goldsmith, President George W. Bush's former special advisor for Faith-Based and Community Initiatives, argued "Electronic government will not only break down boundaries and reduce transaction costs between citizens and their governments but between levels of government as well." Further, online service could promote a direct and almost conversational relationship between the government and citizens. Jeffrey Seifert and Matthew Bonham [cited in West, 2008] argue that digital government has the potential to transform governmental efficiency, transparency, citizen trust, and political participation in transitional democracies.

What are the technical possibilities of e-governance? International Business Machine Corporation (IBM) argued for a broad set of needs in e-governance. Portals [Greco, 2002] can be used as an integrated solution to deliver information, intelligence, and transactions; further, they can be used for collaborative services to speed information from knowledge sharing to crisis management. Geographic Information Systems (GIS) applications are proliferating [Uleman, 2002] across organizations managing natural resource, facilities, and homeland defense. Open-standard geospatial data management tools are convenient and include not only location in longitude and latitude, but also in time and altitude. The creation of a virtual data warehouse [Bernd, 2002] could lead to the optimization of federated data access to heterogeneous data sources in a cross-platform, multiple database management system infrastructure. This would permit users to integrate structured, semi-structured XML and unstructured text and voice data to explore relationships and analyze trends.

Within government, collaboration within an agency is not necessarily challenging, but because of stove-piping of traditional communications within each agency, collaboration across agencies is much more challenging. Intra-agency collaboration [Bradley, 2002] and commercial off-the-shelf (COTS) adapters [Andrews, 2002] would effect e-government by bridging people and knowledge in order to maximize investments in existing technology. Because collaboration of all kinds requires the transfer of skills for understanding, e-learning is integral [Sadler, 2002] to the collaborative workplace. Inter-agency collaboration [Schick, 2002] requires leveraging diverse data via three historically separate technologies: Web content management, document management, and digital media asset management. The solution must address requirements for mass storage, search and access, personalization, integration with business applications, and rapid delivery over the Internet. Web services technologies [Colan, 2002] not only make it easier to integrate existing applications, but they also extend applications and processes that connect official agencies to their constituents and cognate agencies. E-governance also places greater strain on security and reliability of data services. Not only agencies that deal with disasters, but also those vulnerable to internal disasters [Jiang, 2002], face four critical elements when making storage decisions: storage consolidation, data protection, disaster recovery, and data sharing. A variety of security issues facing e-governance are manageable [Crume, 2002]. Possibilities and issues were much discussed in the early 2000s, but by the end of the decade, it was possible to evaluate progress across nations and across both politics and administration.

4.7 Practical Implementation of E-Governance across the United States

Interest in e-governance accelerated both in cities and in the federal level during the 2008 campaign, in which candidate Obama raised record sums from record numbers of online contributors. Online fundraising had grown spectacularly from Joe Trippi's work as a consultant on the early days of the Howard Dean for President campaign (2000) to the Facebook solutions for the

Obama for America 2008 campaign. By online means, the Democrats had reversed the legendary Republican advantage in campaign fundraising.

The interest in e-governance during the campaign led to public interest [Sifry, 2009] in online discussion and downloading of the 2008 financial bailout bill. Citywide portals in Chicago, Washington, D.C., and New York had enabled online users to view city services' progress mapped to geographic areas on demand. Scraping and adapting public databases were being developed rapidly by third parties. There are four trends in Web promotion of government transparency [Sifry, 2009]. The first is *tracking of interest group expenditures on lobbying*: watchdog groups have put databases online. The second is *data visualization*: online services convert data into dynamic graphics. Examples abounded during the 2008 campaign, both by nonprofits online and on CNN television. The third trend is *sousveillance*: or citizens watching from below, with cell phones in a process known as "distributed journalism" or "Little Brother." This process, when picked up by mainstream journalists, had resulted in scandals and political about-faces. The fourth trend is called "the World Live Web," or the "bottom-up, user-generated transparency," which associates mobile phones with streaming video and Twitter. The obvious risk is that there is more noise than signal.

Overall, the social network aspect of "Web 2.0" lends itself to politics, at least to the level of engaging a mass in a simple discussion, not always coherent or connected to careful policy analysis. The online publication of interactive databases is a powerful improvement to traditional notice-and-comment practices. It may assist public interest or non-profit groups in counterbalancing the influence of better funded corporations as many in the public interest community hope. Connectivity among U.S. and state agencies is likely to pay dividends in harmonizing administration of rival programs at cognate agencies to the benefit of both users and officials. Connecting the user side of the Web with the official side, however, is more of a challenge. Remarkably, the Obama administration, though it will no doubt (like all administrations) disappoint after the initial promise, seems far better prepared to lead this development and integration of the Web, open government, and official services than any past administration.

In the 2007 Science, Technology and Industry Scoreboard of the Organization for Economic Cooperation and Development (OECD) [West, 2008], America lagged behind Switzerland, Sweden, Australia, the Netherlands, Denmark, and Germany in Internet subscribers per 100 inhabitants. The United States ranked 15th in broadband access among OECD nations in 2007, down from fourth place in 2001.

Where will e-government have the most impact? Local government, because it typically delivers more personal services (albeit with national government funding), requires interaction with more citizens more often than national government. National government interactions with citizens are less frequent, more serious, and more confidential. Local government interactions are more frequent, less serious, and less risky in security needs. Whereas in a federal system the national government regulates businesses and supplies direct monthly transfer payments in return for annual taxes, local government and state government implement a myriad of personal services at more frequent intervals, some (like education) supplied daily or (like garbage collection) weekly. One example is seen in the hitherto poorly managed District of Columbia government (http://www.DC.gov), which uses free or COTS software, with low-cost cloud storage via Google, to transform its coordination of shared tasks into dynamic common task lists and calendars. Where paperwork flows are the major delay factor in decision making, electronic workflow systems will bring their best efficiencies. In the District of Columbia's case [Economist, 14 Feb. 2008b], the hiring process was reduced from 4 weeks to 48 hours. In communications, including those with police cars, cell phones with a GPS locator option are replacing landlines and expensive radios. In

the bidding process, for a new evidence warehouse, the process was conducted via a Wiki (online interactive notice and discussion page).

In an early evaluation of content and design of 50 state legislature Web sites [Ferber, Foltz and Pugliese, 2002], based on criteria of content, usability, interactivity, transparency, and audience, the highest quality sites were those of New Jersey, Minnesota, Alaska, Hawaii, Oregon, and Connecticut. When political and demographic variables were assessed, the strongest correlations were found with Internet access, education, income, voting participation, and legislative staff.

Without actually re-engineering government departments, a re-engineered "skin" can give the appearance and functionality to the consumer of government services organized by citizen needs rather than by formal departments. USA.gov, in providing information and directing users to over a hundred services elsewhere, is an award-winning portal for its friendly design. An interface tabbed by a consumer category ("kids," "parents," "seniors") offers the most commonly chosen services with "More" links to an alphabetized list of links to a hundred other services. While the site may not be a model of trendy graphic design, its language and organization by tasks and services is well designed to be understandable to end users. Various services are gathered usefully in a companion site, Benefits.Gov.

While governments have often been able to develop informational pages, and then portals, the more sophisticated demands of online payment and other transactional processes have encouraged them to seek partners in private industries who have ready-made online payment systems [Peterson, 2005]. Those U.S. states that have self-funded portals based on fees tend to be among the mountain states, the plains states plus Texas, and the border states plus Alabama and Maine; these tend to be among the conservative states. (The west coast, Midwest and Northeast, generally more liberal states, do not have fee-funded portals.) Massachusetts, having completed the basic applications for transactions, was considering, in 2005, to develop the more sophisticated applications with a private partner. An obvious issue was whether the fees reduced citizen usage of portals, thereby forcing states to maintain both online and physical offices. Peterson's survey found that almost all fees charged were inflicted on businesses rather than individual citizens, thereby largely eliminating resistance from those unable to afford the services.

4.8 E-Government Services beyond the United States

Chadwick [2001] examined cross-continent data (from the United States, United Kingdom, and European Union) gathered under the auspices of the Cyberspace Policy Research Group program. In the context of European concerns about a democratic deficit, and aspirations for democratization through enhanced interaction between citizens and government, and among citizens themselves, he set up three models of e-governance: "managerial," "consultative," and "participatory." From empirical evidence of the various national e-governance operations and plans, he concluded that the democratic possibilities of the Internet were likely to be marginalized as a "managerial" model of interaction became dominant.

A 2008 Brookings Institution survey of global e-government [West, 2008] suggested that many poor countries, in order to achieve economies of scale, could pool their resources in favor of a regional e-government alliance. West's analysis of 1,667 national government Web sites in 198 nations around the world, undertaken in the summer of 2008, found enormous variation between countries. In general, the East Asian Tigers plus Latin leaders had joined the developed nations in their use of e-government. South Korea and Taiwan had overtaken the United States in utilization of technology and was followed by Singapore, Canada, Australia, Germany, Ireland,

Dominica, Brazil, and Malaysia. Some of the poorest countries, not surprisingly, still lacked a Web presence.

The survey [West, 2008] checked systematically for access to publications (96% passed); links to databases (75%); fully executable online services (50%); privacy policies (only 30%); security policies (17%); disabled access (16%); and translation to foreign languages (57). On personalized Web sites (14%) and mobile or handheld personal digital assistant (PDA) accessibility (3%), the next generation had not arrived. As for the United States, West reported, "In general, e-government is not radically transforming the public sector. While some countries have embraced digital government broadly defined, the United States is falling behind in broadband access, public sector innovation, and in implementing the latest interactive tools to government Web sites."

The skills necessary for effective e-government are going to be found in highly skilled OECD countries, but in developing country regions there are going to emerge significant differences between e-government states and their more backward neighbors. Among Middle East nations [Economist, 14 Feb. 2008b], Dubai (with a majority of expatriate workers, a highly skilled young bureaucracy, and a large port to manage via database) leads and the United Arab Emirates competes with Qatar and Oman, though Saudi Arabia and Kuwait lag far behind.

Secure identity and managed payments are an area where governments have a natural interest. Tax departments are always among the first to be created and among the inner cabinet of every regime. London transport's Oyster card [Economist, 14 Feb. 2008b] had credit functions added to its ticket functions, a convenient hybrid.

Non-nuclear family units present a problem for e-government, complicating databases of personal services that are traditionally based on the assumption of nuclear families. For immigrant cultures in a developed state, large and loosely associated extended families, swarming around multiple addresses and with repetitive name combinations, may prove more of a challenge.

Among poorer populations, particularly in the developing world where Internet infrastructure may not reach rural areas, mobile devices (including cell phones and smart phones) may be a more pervasive device for e-government. Text, simplified Web pages, and images including barcodes may be exchanged even in remote areas. The same applies to television once it is equipped with interactive devices for (at least) multiple choice responses.

A difficult choice for central government is whether to centralize services through a portal (or, more likely, a few portals) or whether to let a thousand agency Web sites flourish and then struggle to provide current links to them. Where governments appoint a Chief Information Officer, it will create more pressure for centralization and standardization. By 2008, Alex Butler, a U.K. e-government officer, closed 551 of the 951 central-government Web sites that existed in early 2006 in favor of the centralized Direct.Gov, where parallel sites offer services clustered for citizens and for businesses [Economist, 14 Feb. 2008d].

No matter how poor the implementation in the medium term, in the long term e-government is bound to have powerful effects on the citizen-private organizations-government network. Even providing information and printable forms without more sophisticated services can bypass a time-consuming part of the bureaucracy. As the Economist put it [2008d], "Just as scarcity favors corruption, knowledge brings power. Making the right forms freely available is only part of it. More broadly, putting laws, regulations, parliamentary debates, and the details of state budgets online makes maladministration harder."

Security and mistaken or multiple identities are common issues for official Web sites. In the early phases of developing e-government portals, there have been numerous embarrassing incidents such as hijacking of Web site names, or traffic being attracted to similarly named sites such

as Whitehouse.com, where room cameras survey all the life activities of young women. Many links expire or are missing on government sites as well as on others.

The Organization for Economic Co-operation and Development has defined four stages of e-government, each more demanding than the last. After information comes "interaction," then "transaction," and eventually "transformation." The development of professional connections among nations is a useful indicator of stages of program development. When international organizations hold conferences of senior officers on a program, it has clearly arrived on the government scene. The OECD's 2008 E-Leaders Conference "The Future of E-Government-Agenda 2020" was held in The Hague in 2008. While practitioners of national e-government development exchanged case studies, Lanvin [2008] and Dutton [2008] presented highly perceptive academic visions of the future of e-government.

Based on a statistical study at INSEAD [Lanvin, 2008] mapping governments' IT leadership (x) correlated with facilitation of competition in telecoms (y), governments were ranked. There were three broad circles of e-governments: the "first circle" included developing northern and western European states, North American states, plus Asian Tigers; the second circle included "contestants" (a broader group of these, plus Australia and New Zealand); and the large third circle ("ready or not …") included developing countries. China lay below the trend lines of the others, having government IT leadership but lacking telecoms competition.

The benefits and beneficiaries have developed between 1996 and 2008 [Lanvin, 2008]. In 1996, benefits to government were primarily cost savings—to businesses, better access to information; and, to citizens, information access augmented by better access to services, better value added, and better quality service. Thus, governments had more incentive to create e-government than did the public. By 2008, citizens could perceive the same benefits as before. By contrast, in 2008, government found also efficiency and transparency, citizen satisfaction, and enhanced political capital. Businesses could see gains in productivity. A new set of benefits came to society and the economy, composed of an efficient and innovative public sector, high economic growth (this might be moderated by the 2009 recession), and increased attractiveness to investments and talents.

By 2020, Lanvin [2008] foresees benefits among all parties of local-central government synergy, client-centricity and a competitive, Inclusive democracy. In infrastructure he expects broadband to be ubiquitous and networking commoditized but with a two-tier Internet based on pricing. Although public spending monitoring would continue to be a major purpose, he expects public sector reform to be replaced as a purpose with relations among central and local government agencies, socio-economic efficiency, and perhaps even the death of e-government. Eventually, he expects e-government to be driven by internationalized and localized public private partnerships. Concerns would remain focused on security and privacy, but concerns of systems architectures would give way to new issues of transparency and inclusive democracy.

In his fifth generation of e-government, Lanvin [2008] foresees governments' roles shifting to offering services online, procurement, trade facilitation, civil society participation, and good governance. Reduced by 2020 would be the basic concerns of information and communication technology (ICT) architectures, finance, and construction.

The Oxford Internet surveys [Dutton, 2008] were conducted with in-person interviews in summers 2003, 2005, and 2007 with more than 2,000 respondents over the age of 14. Although higher-income respondents used the Internet at a higher rate than low-income respondents, the curve rose appreciably for all, even between the two years 2005–2007. Middle income respondents' Internet use rose more than those at either end of the curve. Plotting the state's gross domestic product (GDP) as a percentage of the European Union 25's average GDP (x axis) versus the percent of the states households having internet access, there is a strong correlation of GDP

to internet access. Privacy online was increasing as a concern (over multiple issues of identity, anonymity and free expression); digital divides remained a concern; but very few Britons signed a petition online (compared to 25% who had signed a physical petition.)

The biggest sign of growth was the spectacular spread of broadband access to a majority of all households in just four years. In use of e-government [Dutton, 2008], very few respondents had contacted a local or national politician, an increased percentage (about 11%) had paid for each of central or local services or obtained information about a politician. More had obtained information about government policy, but in the highest category of usage, about a quarter had obtained information about each of these: schools, central government services and local council services. Internet users compared to non-users, given a list of tasks, substituted the Internet for personal visits or telephone calls (in the case of tax information), but very few in either category would use books for reference purposes. Both users and non-users gave higher scores for reliability of information—counter-intuitively for those of us who are academics and librarians—to the Internet and television than to newspapers. Use of search engines such as Google rapidly displaced direct access to specific pages for most users between 2005 and 2007. Overall, Dutton compared the Internet as enabling a "fifth estate" akin to the press in the 18th century's enabling the fourth estate. The content of searches increased in sophistication from just 2005 to 2007, with the most increased category being health and medical information.

Structures of ICT are evolving with cross linkages into "clouds." One of the major advantages of e-government is going to lie, via cloud computing or Web interfaces, in inter-agency collaboration. At national government level, in finance and security agencies, where servers are constantly under attack, the cloud storage may still lie in-house, as is traditionally true for physical records, behind firewalls. Other agencies may find their less sensitive records are more amenable to third-party storage in a far-flung cloud.

Methods and approaches to developing sites are also becoming more sophisticated. Customer journey mapping [Perrin, 2006] is a technique to streamline the customer experience by learning when to link across agency databases and shorten the processing time. The delays and demands for information can be flow-charted and a Web experience designed to relieve the burden from the client.

As with the rapid development of other technologies, there are temporary and long-term disparities. It is to be expected that a broad digital divide between haves and have-nots will open up in the first generation of development, but there is a significant probability that it will narrow as all forms of ICT become cheaper and diminishing marginal returns kick in among the leading states. In its 2003 survey, UNPAN, like many other authorities, fretted over the digital divide: "[R]oughly half of the world's population of six billion has never made a telephone call," UNPAN reported [2003, 5], "while, in 2003, only 9.5 per cent of the population had online access." The 2004 survey focused in part II on the disparities of ICT infrastructure among nations, but noted that this was likely to be reduced as ICT spread over time. UNPAN also feared [UNPAN, 2004], "As more of the services in an economy come online, those without access will be marginalized." The result of the UNPAN surveys was the E-Government Readiness Knowledge Base (UNKB), a benchmarking tool for national efforts at placing government services online.

Part II of the 2008 United Nations Public Administration Network report [UNPAN, 2008] assessed the e-government readiness of the 192 member states of the U.N. "according to a quantitative composite index of e-readiness based on website assessment, telecommunication infrastructure, and human resource endowment." It argued that governments can be reinvented and restructured into new arrangements. Part II focused on back-office integration, providing benefits to citizens indirectly via internal efficiencies. It posited three models: single function integration, cross functional integration, and back-office to front-office integration. It found that "the level

of complexity, expressed in terms of the number of functions within the scope and number of organizations involved, is the primary factor influencing a successful outcome." In other words, complex projects had a tendency to produce fewer benefits.

Monitoring and measurement of e-government development, beginning with the basics of infrastructure, is turning into more sophisticated measurement of services. UNPAN [2008, xiii] ranked the United States fourth (behind 3 Scandinavian states) and found its strength was in electronic participation and consultation. It was not among the highest in penetration of broadband, cellular telephone, and other infrastructure. Close to the United States in consultation were the Republic of Korea, Denmark, and France. Overall, the top 35 nations were 75% European and 20% Asian. African nations were by far the lowest in scores. Broadband penetration [UNPAN, 2008, xii] was a powerful driver of the spread of e-government.

4.9 Conclusion

The most surprising development of the 2000s lay not in public administration but in election campaign networking, where few anticipated a sudden transformation in 2008. Obama for America's Web site achieved more in social networking and fundraising than all previous Internet-based or even conventional campaigns before it. Although many other Web sites for campaigns, for mere mortal candidates, have not produced the same spectacular results, electronic campaigning for candidates and for policy reform movements, is here to stay. No doubt, the social networking of "Web 2.0" will lend itself not only to continual campaigning once in government, but also to local government as a community where daily service leads to daily feedback by conversation.

Concepts of electronic services, indicated not only by the flourishing language of e-government but more substantially by the development of increasingly sophisticated services, are clearly broadening as the services are spreading throughout the developed and some of the developing nations. There is also a growing awareness that reorganizing services for the consumer experience will eventually require at least dynamic cross-links in official databases, and, in some cases, re-engineering government into a structure of one-stop shopping from the consumer perspective. "Governments are increasingly looking towards *e-government-as-a-whole concept* which focuses on the provision of services at the front-end," UNPAN concluded [2008, 3], "supported by integration, consolidation and innovation in back-end processes and systems to achieve maximum cost savings and improved service delivery."

Most likely to occur early are services with low cost and obvious returns to government (such as providing forms and press releases online almost universal by 2009). Later developments that are more complex, and over a generation, may actually transform public administration. Of the bureaucratic reforms proposed in the 1990s, reinvention (as client-centered organizations) may actually occur though frequent and direct interaction online and through re-engineering (restructuring departments from the bottom up to associate cognate client services under one agency). E-government also shows considerable promise in monitoring and measuring services, with the usual proviso that it is easier to measure response times and customer satisfaction than it is to measure more substantial factors such as compliance with detailed and conflicting legal provisions, or more intangible factors such as quality of administration (education being a contentious example).

This virtual reorganization by cross-linked databases with a Web-based front end may prove less disruptive than the 1970s and 2000s creation of the super-departments (HEW, HUD, DHS), but also more effective than the 1980s creation of the "czar" for the war on drugs.

E-government represents a more sophisticated confluence of electronic release of public records (EFOIA) with aspirations to reinvent and restructure bureaucracies towards customer service and

public-private partnership, to enhance public accountability, and reinvigorate civic engagement. Because the Web permits low-cost reforms and virtual restructuring of agency boundaries, it may raise demands to harmonize and standardize provisions of services across agencies and laws.

References

Andrews, Rik. 2002. Integrating the e-government enterprise. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Bernd, Eric. 2002. Mission critical: Transforming your data resources. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Bradley, Steve. 2002. E-collaboration: Human capital transformation. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Chadwick, Andrew. 2001. Interaction between states and citizens in the age of the Internet: E-government in the United States, Britain and the European Union. Paper prepared for delivery at the 2001 Annual Meeting of the American Political Science Association, San Francisco, August 30-September 2, 2001. Accessed via PROceedings, Political Science Research Online.

CIA. 2009. FOIA page online, US central intelligence agency. Accessed at http://www.foia.cia.gov/search_archive.asp

Colan, Mark. 2002. Web services for e-government. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Dutton, William. 2008. E-government and the rise of the fifth estate, Oxford Internet Institute, Oxford University. Paper presented at the OECD's 2008 E-Leaders Conference, "The Future of E-Government—Agenda 2020", The Hague, 6-7 March 2008. Accessed 31 May 2009 at http://www.oecd.org/dataoecd/42/58/40304942.pdf

Economist, The. 2008a. The electronic bureaucrat. A special report on technology and government, *The Economist*, 14 Feb. 2008. Accessed in May 2009 at http://www.economist.com/specialreports/PrinterFriendly.cfm?story_id=10638002

Economist, The. 2008b. Making it happen. A special report on technology and government, *The Economist*, 14 Feb. 2008. Accessed in May 2009 at http://www.economist.com/specialreports/PrinterFriendly.cfm?story_id=10638083

Economist, The. 2008c. The good, the bad and the inevitable. A special report on technology and government, *The Economist*, 14 Feb. 2008. Accessed in May 2009 at http://www.economist.com/specialreports/PrinterFriendly.cfm?story_id=10638105

Economist, The. 2008d. Look it up on the web: The growth of i-government. A special report on technology and government, *The Economist*, 14 Feb. 2008. Accessed in May 2009 at http://www.economist.com/specialreports/PrinterFriendly.cfm?story_id=10638105

Economist, The. 2008e. Identity parade: It's best for governments not to know too much. A special report on technology and government, *The Economist*, 14 Feb. 2008. Accessed in May 2009 at http://www.economist.com/specialreports/PrinterFriendly.cfm?story_id=10638196

E-Government Act, 2002 (Pub.L. 107-347, 116 Stat. 2899, 44 U.S.C. § 101, H.R. 2458/S. 803), enacted 17 December 2002, effective 17 April 2003.

Electronic Freedom of Information Act Amendments of 1996. PL 104-231. 110 Stat. 3048.

Federation of American Scientists. 2009. *Secrecy News*, 26 March 2009.

Ferber, Paul, Franz Foltz, and Rudy Pugliese. 2002. The politics of state legislature websites: An evaluation of content and design. Paper prepared for delivery at the 2002 Annual Meeting of the American Political Science Association, Boston, MA, 29 August-1 September 2002. Accessed in 2002 at http://apsaproceedings.cup.org/abstracts/038/038012FerberPaul.htm

Garber, Megan. 2009. Who moved his cheese? There's more to openness than a new web site. Campaign desk, special feature on transparency. *Columbia Journalism Review,* 21 January 2009. Accessed at http://www.cjr.org/transparency/

Gellman, Robert. 1996a. The new EFOIA law: one person's view. *Access Reports* 22(20):1, 3–8.

Gellman, Robert. 1996b. Testimony before the house committee on government reform and oversight, subcommittee on government management, information and technology. Hearings on S. 1090, the Electronic Freedom of Information Improvement Act, as reported by the Senate Committee on the Judiciary, June 14, 1996. Washington DC: USGPO.

Gellman, Robert. 1997. Shortcomings of the proposed Electronic Freedom of Information Improvement Act (S. 1090). *Government Information Quarterly* 14(1):1–10.

General Accounting Office. 2001. *Information Management: Progress in Implementing the 1996 Electronic Freedom of Information Act Amendments.* Report GAO-01-378, March 2001. Washington DC: USGPO.

Goldman, Patti L. 1988. Counsel to Public Citizen Litigation Group and FOI Clearinghouse. Interview with the author, January 1988.

Greco, Enzo. 2002. Portals: Gateway to citizen services. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track,* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Halstuk, Martin E. 2000. Speed bumps on the information superhighway: A study of federal agency compliance with the Electronic Freedom of Information Act of 1996. *Communications Law and Policy* 5:423.

Henderson, Jennifer J., and Patrice McDermott. 1998. Arming the people … "with the power knowledge gives." An OMB Watch report on the implementation of the 1996 "EFOIA" amendments to the Freedom of Information Act. Washington DC: OMB Watch. Available http://www.ombwatch.org/

Henderson, Jennifer J., and Patrice McDermott. 1999. A people armed? Agency EFOIA implementation. Washington DC: OMB Watch. Available http://www.ombwatch.org/info/efoia99/efoiareport.html

IBM. 2002. Integrating the e-government enterprise. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track, 2002 (October).* Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Jiang, Patricia. 2002. Disaster recovery with storage management software. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Lanvin, Bruno. Where is e-government going in 2020? Paper presented at the OECD's 2008 E-Leaders Conference, "The Future of E-Government—Agenda 2020," The Hague, 6-7 March 2008. Accessed 31 May 2009 at http://www.oecd.org/dataoecd/42/57/40304889.pdf

Lewis, Jeremy R.T. 2000a. FOIA and the emergence of federal information policy in the 1980s. Chapter 4 of G. David Garson (ed), *Handbook of Public Information Systems*. New York and Basel: Marcel Dekker, Inc.

Lewis, Jeremy R.T. 2000b. Electronic access to public records. Chapter 15 of G. David Garson (ed), *Handbook of Public Information Systems*. New York and Basel: Marcel Dekker, Inc.

Lewis, Jeremy RT. 1995. Reinventing (open) government: State and federal trends. *Government Information Quarterly* 1995; 12(4):427–455.

National Science and Technology Council. 2009. Harnessing the power of digital data for science and society, report to the National Science and Technology Council, January 2009. Accessed at http://www.nitrd.gov/about/Harnessing_Power_Web.pdf

OpenTheGovernment.org. 2009. TopTenReport, March 2009, accessed on 24 May 2009, at http://www.openthegovernment.org/otg/TopTenReport.pdf

Perrin, William. 2008. Making government work better, Paper presented at the OECD's 2008 E-Leaders Conference, "The Future of E-Government—Agenda 2020," The Hague, 6-7 March 2008. Accessed 31 May 2009 at http://www.oecd.org/dataoecd/43/57/40306111.pdf

Peterson, Shane. 2005. Picking up the tab, *Government Technology*, 18(8) August 2005. GovTech.net; Reprint accessed on 31 May 2009 at http://www.nicusa.com/pdf/EGOV_GovTech-Aug05.pdf; *Public Citizen v. Office of Management and Budget*. 127 F. Supp. 2d 1 (D.D.C. 2000)

Sadler, Andrew. 2002. Beyond collaboration: E-learning in the government workplace. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Schick, Jeff. 2002. Content management: Sharing information across agency boundaries. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

Sifry, Micah L. 2009. A see-through society: How the web is opening up our democracy. Special feature on Transparency, 21 January 2009. *Columbia Journalism Review.* Accessed at http://www.cjr.org/transparency/

Uleman, Robert. 2002. Geospatial data management: Open standards with high performance. Conference presentation, October 2002, hosted by IBM Corp. *The Inside Track* 2002 (October). Armonk, NY: IBM Corp. Accessed via http://www-3.ibm.com/events/insidetrack/federal/index.html

UNPAN. 2003. 2003 Global e-government survey. New York: United Nations Public Administration Network. Accessed 31 May 2009 at http://unpan1.un.org/intradoc/groups/public/documents/un/unpan016066.pdf

UNPAN. 2004. United Nations global e-government readiness report 2004: Towards access for opportunity, New York: United Nations Public Administration Network. Accessed 31 May 2009 at http://unpan1.un.org/intradoc/groups/public/documents/un/unpan019207.pdf

UNPAN. 2005. UN global e-government readiness report 2005: From e-government to e-inclusion. New York: United Nations Public Administration Network. Accessed 31 May 2009 at http://unpan1.un.org/intradoc/groups/public/documents/un/unpan021888.pdf

UNPAN. 2008. 2008 Global e-government survey: From e-government to connected governance. New York: United Nations Public Administration Network. Accessed 31 May 2009 in summary at http://www.unpan.org/egovernment.asp and in full at http://unpan1.un.org/intradoc/groups/public/documents/un/unpan028607.pdf

UNPAN. 2009. The United Nations government readiness knowledge database. New York: United Nations Public Administration Network. Accessed 31 May 2009 at http://www2.unpan.org/egovkb/index.aspx

U.S. Congress. House. 1985. Committee on Government Operations, Subcommittee on Government Information. *Hearings on Electronic Collection and Dissemination of Information by Federal Agencies.* 99th Congress, 1st Session. Washington, DC: USGPO.

U.S. Congress. House. 1986a. Committee on Government Operations. Freedom of Information Act Amendments of 1986. House Report 99-832. 99th Congress, 2nd Session. Washington, DC: USGPO.

U.S. Congress. House. 1986b. Committee on Government Operations, Subcommittee on Government Information. Electronic collection and dissemination of information by federal agencies: A policy overview. House Report 99-560, 99th Congress, 2nd Session. Washington, DC: USGPO.

U.S. Congress. House. 2003. *E-Government Act of 2002, H.R. 2458 and S. 803.* PL 107-347; 44 USC 101. Washington DC: USGPO. Accessed in May 2009, at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=107_cong_public_laws&docid=f:publ347.107.pdf

USA.gov. The US federal government consumer portal, offering 100 services in consumer-friendly organization and language. Accessed on 31 May 2009 at http://usa.gov/.

Walters, Sheryl. 1988. Counsel to the National Security Archive. Interview with the author, January 1988.

West, Darrell M. 2008. Improving technology utilization in electronic government around the world, 2008. Washington DC: The Brookings Institution. Accessed on 30 May 2009, at http://www.brookings.edu/reports/2008/0817_egovernment_west.aspx?p=1

Chapter 5

Citizen Participation and Direct Democracy through Computer Networking: Possibilities and Experience

Carmine Scavo and Younhee Kim

CONTENTS

5.1 Introduction

Advanced computer networking technology enables us to re-energize participatory democracy and regenerate new types of political communications between citizens and government, as well as

citizens and political institutions in the U.S. government has attempted to maximize information and communication technologies (ICTs) to deliver government services, to promote government transparency, and to empower the citizenry. Political organizations also have actively utilized new technology infrastructure to address widespread cynicism toward political practices and to connect with voters in the political discourse by mobilizing, educating, and organizing their power. As citizens perceive themselves as more than simply consumers of government [Schachter, 1997] and as more than static voters in the political spheres, more and more citizens are accessing the Internet to reflect their opinions with governments, interconnect with like-minded fellow citizens, and participate in politics. And yet, questions still loom: Will computer networking bring increased deliberative democracy to the United States, and if so, how?

This chapter looks at some of the current governmental and political uses of computer networking and the Internet. The chapter subscribes to the view that public managers, who are under constant pressure to increase public trust and engagement in government, should take advantage of advanced computer networking to improve their communications with citizens and to create more opportunities for citizen participation in government. The main goal of this chapter is to shed some light on how the functioning of democracy is possibly being strengthened through computer networks, particularly at the local level. The chapter begins with a discussion of how computer technologies can enhance the function of the U.S. democratic system with an emphasis on three areas: increasing voter information, improving the quality of political communications, and promoting a high level of citizen participation. The chapter then moves on to describe some major innovations in the use of computer networking in political and governmental affairs and examines the impact of these innovations on public management.

The first version of this chapter appeared in 2000 and was researched and written in 1999; the second version appeared in 2005 and was researched and written in 2004. The mid-1990s was a time of tremendous growth in the Internet and in computer networks in the United States but as the decade ended, growth in the number of new Internet users was beginning to level off. Growth did not accelerate again (but at nowhere like the rates of the mid-1990s) until 2002 when it was reported that some 66% of U.S. adults were using the Internet [Greenspan, 2003]. Most recently, Internet permeation in the United States has been estimated at 72.5% [InternetWorldStats, 2008]—one of the highest levels of any country in the world.* From the last decade of the twentieth century to the first decade of the twenty-first, the Internet went from a novelty to a virtual necessity for many in the United States. In the process, the Internet also became much more institutionalized and commercialized. As the ".com bubble" of the late 1990s burst, many questionable uses of the Internet were abandoned and the mood of Internet use became more skeptical. Users became more appreciative of security and cost issues in the use of computer networks while also seeking to discover whether virtual methods of conducting their affairs actually were superior to their more traditional alternatives. Thus, this chapter has a more questioning tone than did its first two versions, and it is not as optimistic about the promises of computer networks in remaking American democracy. Part of that is the result of national experience with some of the techniques and processes whose potential we could only describe some four years ago. The chapter still concludes on a positive note. While we do not think that the United States has reached a point where representative democracy can be replaced with direct democracy through computer networking, and we are uncertain about whether the problems associated with security and representation can ever be completely solved,

* Higher levels of Internet penetration are reported only in Japan (73.8%) and Australia (79.4%). Only China, with some 253 million Internet users, shows a larger number of Internet users than the U.S. (220 million users).

we nevertheless think that a well-designed online public information system can significantly improve democracy in the United States.

5.2 Information, Communication, and Participation

Like all other innovations in ICTs, the rapid growth of computer networks has rekindled our long-cherished dream for greater citizen involvement in the political process. This is because, compared to other methods we have used in communicating about politics, computer networks provide a much less expensive alternative and allow individuals to do many things that were formerly impossible to do.* With the technologies currently available, democratic life can be improved in at least three different areas. First, computer networks can be used to make political information more accessible and therefore help citizens become better informed about current political and policy issues. Second, computer networks can facilitate a direct dialogue between public officials and citizens. At the barest minimum, this will help make government more open, responsive, and accountable, and therefore more worthy of citizens' trust. Political debate and interest can be stimulated in formerly apathetic citizens by making it less costly for them to engage in political discourse. Third, the first two phenomena can lead to an increase in citizens' likelihood of voting and becoming involved in policymaking. In summary, computer networks have the potential to reduce the distance between citizens and their government, thus making government more responsive to the wishes of the population.

The specific Web-based technologies discussed in this chapter—what have come to be known as Web 2.0—include advanced Web site design, applications of e-commerce, blogs, social-networking, video-sharing, wikis, and others. While it is tempting to state that increased use of these technologies by government and the public will result in a remaking of the relationship between government and the public, such a position is more of an assumption than it is an empirical reality [Garson, 2005]. The idea that information technology contributes to making government more progressive is only one possible effect of ICT on government operations. While this theory (democratization/empowerment) is "the leading theoretical perspective on the impact of ICT in organizational life" [Garson, 2005: 667], another theoretical formulation—critical theory—can lead to exactly the opposite conclusions: that government (or large corporations) can use advanced information technology to manipulate the public and control mass behavior.

The experience of the nine years since the original version of this chapter appeared demonstrates that the dramatic increase in use of ICTs by political and governmental bodies has not remade democracy in the United States and also has not unmade it. Instead, the technologies have become incorporated into the framework of U.S. democracy and have caused incremental changes—a position that Garson [2005] terms sociotechnical systems theory. Some of these incremental changes have been in normatively positive directions, others in normatively negative directions.

5.2.1 Information Acquisition

The bulk of political information in the modern world comes from television, radio, newspapers, magazines, and—increasingly—the Internet. Each of these media requires varying degrees of

* The idea that political activism is determined in part by considerations of costs—whether they be financial or nonfinancial in nature—involved in the acquisition and communication of information has a long tradition in research on political behavior. A pioneering work is *An Economic Theory of Democracy* by Anthony Downs (1957).

effort or "investment" on the part of those who view or listen to the source. They have all, however, been accepted by the public to various degrees and have played a critical role in the evolution of political communication—newspapers in the 19th century, radio in the 1930s, television since the 1960s, and the Internet in the 21st century. In public opinion polls, when respondents are asked questions about the importance of various media as sources of information on political campaigns and candidates, television, on the one hand, and newspapers and magazines, on the other, vie consistently with each other for the topmost spot. At the same time, the number of people relying on the Internet for political information has increased dramatically since 2000. In a recent Pew Research Center report, fully 46% of those surveyed reported learning about the 2008 political campaign from ICT sources with more than 50% of those under the age of 50 doing so [Smith and Rainie, 2008]. In particular, the use of Web 2.0 technologies as sources of political information has grown—22% of respondents reported watching campaign commercials online; 19% watched interviews with candidates; and 22% have done at least one of nine online activities queried.*

Political campaigns have made great headway in adapting ICT as a tool to provide information to those who might be interested in voting for candidates. By the 1996 presidential election, all the major presidential candidates had a Web presence, and they were using these sites to deliver campaign literature, recruit volunteers, and solicit donations. In the 1998 election cycle, the Internet gained even broader use. Nearly two-thirds of races were fought virtually as well as physically, with challengers outnumbering incumbents and Republicans outnumbering Democrats on the Web [Martin, 1998]. Across all competitive races—U.S. Senate, U.S. House of Representatives, and governorships—candidates' Web presence was greater than in noncompetitive races [Kamarck, 1999]. In the 2000 presidential elections, the campaigns of both the major party candidates—Al Gore and George W. Bush—developed sophisticated Web sites and made heavy use of the Internet to provide information to their supporters and to solicit donations from them. The trend continued and accelerated into the 2002 elections. E-voter [2002] reported that eight Republican U.S. Senate candidates, running in tightly contested elections, purchased banner advertisements on AOL Web sites. Six of the eight won their elections. Various authors have noted that the provisions of the McCain-Feingold Campaign Finance Reform Bill do not regulate candidate use of the Internet. Thus, expenditures on independent Web sites do not come under the bill's spending limitations, an omission that many see as causing a huge upsurge in Internet interest by political campaigns in the future [E-voter, 2002; Institute for Politics, Democracy, and the Internet (IPDI), 2002]. In addition, using the Web to solicit donations may result in more small donations, all of which count as "hard money." Many of the candidate Web sites in the 2002 elections were not, however, particularly well developed, and a number of commentators were rather critical of the lack of imagination candidates showed in their use of the Web [IPDI, 2002; Bowman, 2002].

In the 2004 presidential election, the campaign of Democratic presidential contender, and former Vermont Governor, Howard Dean, made the greatest use of the Internet. Research by Schneider and Foot [2003] showed that of 39 Web site features coded, Dean's

* These are: Forwarded or posted someone else's political commentary or writing (11%); Signed an online petition (10%); Signed up to receive email from the candidates or campaigns (9%); Forwarded or posted someone else's political audio or video recordings (6%); Contributed money online to a candidate (6%); Posted your own political commentary or writing to an online news group, Website, or blog (5%); Created tags for news, information, or photos about politics or the election (2%); Signed up online for any volunteer activities related to the campaign (2%); and Created or posted your own political video or audio recordings (<1%).

Web site contained 30, more than any other Democrat and also more than President Bush's re-election Web site. Dean's Web site featured the ability to donate money and to volunteer for campaign activities; there was a Dean shop that sold campaign-related material (shirts, hats, etc.) as well as a Web log (blog) Web site that compiled the personal stories of Dean volunteers around the United States. The fundraising successes of the Dean campaign have been widely noted [Drinkard and Lawrence, 2003; Mariantes, 2003; Tull, 2003; Bruner, 2003] and generated enough funding that he, after conducting an online vote of his supporters, declined federal matching funds, making him the first Democratic presidential candidate to do so.

For the 2008 presidential election, social networking through the Internet had tremendous impacts on shaping and changing politics as well as citizen's participation. Internet social media such as Facebook, YouTube, and MySpace were powerful political tools for both candidates and citizens, especially tech savvy voters. In particular, candidates relied on Facebook.com because it facilitated the identification of key supporters and the ability to mobilize them quickly. These social media were utilized not only to acquire political information about candidates but also to leverage more people via social networks on political issues.

The campaign of Barack Obama made especially good use of Web 2.0 utilities. Joe Trippi, who was one of the designers of Howard Dean's 2004 Web presence, worked for Obama in 2008. He comments, "The ability to connect via the Internet to groups, segments, and individuals changes everything. It flattens the process and creates a bottom-up approach to participation" [Greengard, 2009: 16]. The Obama campaign, whose electronic presence became known as OFA (Obama for America), organized around two interrelated but different Web sites. The first—www.barackobama.com—was a more traditional campaign Web site and included issue papers, donation information, an Obama "shop," and so forth. The second Web site—www.myobama.com (known widely as MyBO)—became the home of the online community of Obama supporters, allowing registered users to find local events and groups, contact undecided voters in one's area, and share one's story via a blog. MyBO included instructions on how to use the site with an introductory video by Amy Hamblin. In the Texas delegate selection process in March, 2008, MyBO reported some 100,000 registrants (compared to 20,000 for Senator Hillary Clinton). Talbot describes the process of organizing volunteers:

> The MyBO databases could slice and dice lists of volunteers by geographic microregion and pair people with appropriate tasks, including prepping nearby voters on caucus procedure. "You could go online and download the names, addresses, and phone numbers of 100 people in your neighborhood to get out and vote—or the 40 people on your block who were undecided," Trippi says, "Here is a leaflet: print it out and get it to them. It was you, at your computer, in your house, printing and downloading. They did it all very well … I remember saying, 'Game, match—it's over'" [Talbot, 2008: 78].

After taking office in January 2009, President Obama and his administration announced plans to morph OFA into "Organizing for America" or what is known as OFA 2.0. As described by Paulette Aniskoff, OFA 2.0's goals "will be to support Obama's legislative agenda, do electoral organizing behind local candidates, expand civic engagement, and facilitate two-way communication with the administration. 'There will be some way for the administration to be communicating with the grass roots, but we don't know how that will work yet,' she said" (Silfry 2008). OFA 2.0's first major event was a series of neighborhood meetings on Saturday, February 7, 2009. These events were announced with a great deal of media attention, but apparently the attendance

was not what the organizers hoped they would be [Quinn, 2009]. As of the publication date for this chapter, OFA 2.0's future as an online presence is well established, but the translation of that online presence into a physical entity is unclear.

It is clear that there is a major distinction in the use of the Web between those sources of information that are simply transposed from other media (print, broadcast, etc.) and those that are designed to take advantage of the Web's unique resources. For example, placing verbatim articles from print newspapers on the newspaper's Web site may increase readers' numbers and geographical dispersion, but it is difficult to argue that this increase in readership is dramatically changing U.S. democracy. On the other hand, soliciting donations for a political candidate via a secure Web site and organizing volunteers *have* contributed to a shift in the political fortunes of the Democratic Party. Howard Dean's use in 2004 of the online voting features of his Web site to poll his supporters on the issue of accepting or declining federal matching funds was a first in electoral history.* When readers go to an online archive to retrieve newspaper and magazine articles to send via e-mail to friends, they are repeating the same activities as their parents did when they cut those articles out of the print version of the newspaper or magazine and sent them via land mail to their friends. Sending the article electronically to a large number of friends simultaneously can be done at much reduced cost over photocopying the print version of the articles and sending them out via land mail, even though such simultaneous transmission is most likely a violation of the newspaper or magazine's copyright on the original article.

ICTs are especially good for citizens to be exposed to the views or information that may be truncated or ignored in other media where a few big players tend to dominate the scene. The lower costs involved with the publication of material on the Web results in a greater number of longer pieces being published on a variety of topics—some of which might not be commercially viable in a print environment—by a large number of entrepreneurial publishers. The result has been a tremendous outpouring of information in an anarchic environment allowing users to be able to gather virtually all shades of opinion (or to tailor the opinions gathered to be in exact agreement with his or her own) but also providing a perplexing series of obstacles to the inexperienced user or the user looking for a single definitive source. One needs only to do a search in any major search engine on a simple concept to see the wide variety (and lack of consensus) that the Web contains on the topic in question. Differentiating between the mainstream sources and the fringe, between the credible and incredible sources, between the straightforward and satire sites, etc. can be difficult for the novice and has resulted in a number of embarrassing and humorous episodes.

5.2.2 Communication

Before the advent of computer-mediated political communication, a citizen could register his or her opinions with government and communicate with fellow citizens through personal visits, mail, or by telephone. But each of these one-to-one means of communication has costs associated with them—costs that often have a deterrent effect on many potential users. United States public officials often complain about how difficult it is for them to ascertain how "average citizens" feel about various issues and how they fear that much of the communication they receive from their constituents is stimulated by interest groups who represent organized or resource-rich interests much better than they do disorganized or resource-poor interests and who are attempting to replace one-to-one communications with many-to-one communications. To compensate for the

* George Bush during the 2000 nomination process and Barack Obama during the entire 2008 campaign did not accept matching funds, but neither had an online vote or supporters to help decide the matter.

bias that is apparent in interest group communications, officials often rely on media reports or the work of pollsters to provide them with information from the "silent majority." But journalists are not accountable to anyone except their employers and can therefore substitute their own professional or personal tastes [or those of their employers] for what the public actually thinks and feels. Pollsters are in a similar situation. In addition, however, the number of polls being conducted in the United States today, along with the different findings one can generate in polls as a result of differing methodologies, question wordings, etc. make it difficult for a public official to "govern by the polls," although many recent officials have been accused of attempting to do so. The major danger in all of this instantaneous flow of communication is, of course, possible volatility in public opinion. Public opinion without knowledge is problematic. "An electorate so easily swayed by simple arguments and disinclined to look for more information, with easy access to voting on policy decisions or elections, is more destructive than an apathetic electorate that chooses not to vote" [Turk, 2008: 40].

In the current age, e-mail and text messaging have been added to the one-to-one mix, making direct communication easier and less costly than ever. E-mail is the most familiar tool one can use for one-to-one correspondence between government and citizens and among citizens. In the late 1990s, the Clinton administration made it extremely easy for average citizens to send e-mail to the President. All that was necessary was for an e-mail user to send a message to president@whitehouse.gov. Messages were read by one of a large number of volunteers whose job it was to read incoming e-mail and respond to the mail. Messages were routed to officials in the White House, as volunteers apparently saw fit, and at least some e-mails received official responses. A system like this could only work properly, however, if the incoming e-mails did not reach the point of overloading the system's capacity—electronic or human. By the first few years of the Bush administration, the number of e-mails being received by the White House was reaching 15,000 per day [Markoff, 2003] and, for a variety of reasons, the White House decided to reconfigure how e-mail reaches the President. Beginning in the summer of 2003, those who sent e-mail to the President were sent to a series of Web pages where they were required to input additional information before the message actually went to a human reader. While it was still possible to send an e-mail directly, as it was earlier, the sender might only receive an automated response [Markoff, 2003]. In its early weeks in office, the Obama administration pledged to reverse this policy. Under its "contact us" tab, the Web site whitehouse.gov now says, "President Obama is committed to creating the most open and accessible administration in American history."

One promising use of many-to-many communications is exemplified by the Minnesota E-Democracy project (www.e-democracy.org). Minnesota E-Democracy describes itself as "a non-profit, non-partisan volunteer-based project, whose mission is to expand participation and build stronger democracies and communities through the power of information and communication technologies and strategies." It hosts a number of online managed* listings where members can discuss current political issues. E-mail format was chosen by the organizers over more anarchic discussion forum formats for a variety of reasons—e-mail is easy to use and it is the most popular of all online tools. But more than this, e-mail also does not require participants to "join" a forum each time they go online, and email also has its own rules of etiquette. The self-developed rules of Minnesota E-Democracy call for a six-month suspension from the forum for a breach of a rule

* Online lists can be moderated—in which the list manager receives and approves all postings before they are put on the list; managed—in which the manager only has "housekeeping" functions (keeping the list on topic, warning about inflammatory postings, etc.); or unmoderated, in which all postings are sent directly to the list without any intervening authority.

after one warning. "However, members are encouraged to take responsibility for guiding each other … via private e-mail, as to what is deemed suitable posting content and style" [Dahlberg, 2001: 5].

Another area for the use of computer networks is more spontaneous grassroots mobilization and organization. Through mailing lists and bulletin boards, one can find hundreds or thousands of like-minded fellow citizens in or outside of a community who one may never meet personally. This has made it more possible for citizens to form spontaneous groups of wide ideological hues and to sustain, expand, and organize political actions to influence public policies. The protests against globalization that occur at nearly every meeting of the World Trade Organization, or other international economic or financial groups, are organized through ICTs. One need only to access the Web site www.protest.net to find a calendar listing almost every international meeting of any potential target group and the protests that are planned to take place at the meeting of that group. The new phenomenon of the "flash mob"—people gathering at a given location to engage in some purpose that is revealed when they arrive, and then disappearing quickly—is almost wholly an Internet-inspired creation. E-mail is used to distribute the instructions as to where to gather and to whom to look for further instructions. Whether flash mobs are protests or performance art cannot currently be ascertained, but the phenomenon is heavily Internet oriented.

5.2.3 Citizen Participation

Voting: Two hundred years ago, the framers of the U.S. Constitution designed a republican form of government. Since then, numerous changes have been made in an attempt to expand the scope of political participation. The most prominent of these is the expansion of the universe of eligible voters to, first, men who did not own property, and, later, to former slaves, women, and 18-year olds. In most states, the choice of who is listed on an election ballot is determined in a primary election, a device designed to increase citizen participation. In New England, the tradition of the town meeting exists to the current day. Issues of importance to the community are decided in meetings of all adults who care to take part. In some areas of New England, local government budgets are established in a similar way. In other parts of the United States, citywide or statewide elections determine tax rates, term limits, and a variety of policy issues. Recall elections can be used to turn unpopular office-holders out and replace them with challengers, as Governor Gray Davis of California learned, to his dismay, in October 2003, when he was voted out of office in a recall election and replaced by Arnold Schwarzenegger.

Voter turnout dropped throughout the 1990s. Beginning in 2000, however, voter turnout began to increase. The percent of voter-age population who voted in presidential elections increased from 51.3% in 2000, to 55.3% in 2004, and to 56.8% in 2008. In off-year Congressional elections, the numbers are lower, but still up—from 36.4% in 1998, to 37.0% in 2002, to 37.1% in 2006. Local elections draw far fewer voters with turnout dropping into the twenties or even teens in city council, county commission, judicial, and other races. Recently, several states and localities have experimented with alternative voting techniques in order to redress low voter participation rates—"no excuse" absentee balloting (North Carolina, Texas), mail-in ballots (Oregon), and so on.

Information and communication technologies can do better than this. A wide variety of businesses have equipped their Web sites with the function to allow a customer to register with a merchant and send feedback to the manufacturer of a product. All the major news organizations use the Web to poll the public on a wide variety of issues. While governments have generally lagged behind business in the adoption of Web technology, several recent cases provide some encouragement. Voter registration information is available online in a number of states.

In some states (e.g., South Carolina) voters can download a registration form from the state Web site. Beyond this, several states have begun to experiment with online voting. For example, in the 2000 presidential primary season, the Arizona Democratic Party held its statewide presidential primary partially online while, in 2004, the Michigan Democratic Party allowed virtual participation in the statewide presidential nominating caucuses. After a successful 2000 experiment that allowed some military and overseas voters outside the United States to cast their votes electronically, the U.S. Department of Defense moved to use online voting for all overseas military forces in the 2004 election. However, early in 2004, this plan was scrapped after four prominent computer experts highlighted security risks in the Pentagon's SERVE (Secure Electronic Registration and Voting Experiment) plan [Harris, 2004]. Nevertheless, surveys of both military and non-military American citizens living overseas reported high levels of satisfaction with online voting experiences and increased desire for online voting opportunities [Cain, MacDonald, and Murakami, 2008].

Security issues in online voting can take several forms. First are issues related to ballot security and verification, that only registered voters are voting and that each voter only casts one vote. Ballot security involves the possibility of a stolen election—that somehow a corrupt candidate or political party can change the votes stored electronically—the online analogue of stuffing the ballot box. More sinister than this is the possibility that computer hackers can make their way into the system to disrupt the election, either through a denial of service type attack that would shut down the server collecting votes or through the introduction of a computer virus or Trojan Horse into the election software system. Even worse than this is the scenario painted by the Voter Integrity Project in their suit against the Arizona Democratic Party's 2000 online presidential primary: the possibility that a foreign terrorist group could alter the results of an election in the United States in such a way that the alteration would be undetectable or that the administration of the election could fall into the hands of a foreign-owned company [Burke, 2000].*

A second set of issues concerns access to the Internet. There is disagreement on the issue of whether online voting might exacerbate the problem of differential voting rates for wealthier and poorer individuals. While Alvarez and Nagler [2001: 1152] conclude, "Internet voting is likely to exacerbate the current problem of class-bias in American elections if it is introduced any time in the near future," Morris [2001: 1051] responds, "The heralded digital divide, in which minorities and poor people are shut out of participation over the Internet, will fade into the past as soon as Internet access is divorced from personal computers.... When the average family can access the Internet through their TV sets, even the poorest communities will enjoy a very high level of Internet participation." While "the digital divide" (differential Internet usage by some classes as compared to others) has declined in recent years, there are still some differences in Internet usage between some groups of Americans and others. This is particularly the case when we compare urban, suburban, and rural areas. Some areas of rural America currently do not have ready access to the Internet except by long-distance telephone connections to remote Internet Service Providers (ISPs) or satellite connections, which makes going online inconvenient and/or costly.

At least two major studies of the possibility of online voting took place in the aftermath of the 2000 presidential election—one by the California Internet Voting Task Force [2000] and the

* Of course, problems with electronic voting do not have to be high-tech to be severe. In one precinct in Craven County, NC the report of early votes in the 2008 presidential election was delayed, owing to a dead battery that allowed the onboard memory to decay in one machine. Apparently, the battery went dead because local election officials did not know they needed to keep the machine connected to the electrical service in order to keep the battery charged [*Sun Journal* 2008].

second by Internet Policy Institute (IPI) [2001]. Both concluded that security, access and implementation issues in online voting require an incremental approach to the development of such system. While both said it was technologically possible to utilize the Internet to conduct elections, "it would not be legally, practically, or fiscally feasible to develop a comprehensive remote Internet voting system that would completely replace the current paper process used for voter registration, voting, and the collection of initiative, referendum, and recall petition signatures" [California Internet Voting Task Force, 2000: 1].

Perhaps the simplest form of Internet-based voting is an electronic variation of absentee balloting [Elliott, 2001]. Currently, when an individual casts an absentee ballot by mail, the voter completes a paper ballot and puts this into some sort of security envelope that has no identifying characters on it. This security envelope is either handed directly to an elections official or put into another mailing envelope that has a space for the voter's signature, and sent via U.S. mail to the elections office. When the envelope is received, the voter's signature is checked, the outside envelope is discarded, the inside envelope is opened, and the vote counted. E-mail could be used as an electronic analogue to this process. The ballot could be sent to the individual through a secure e-mail message. The voter could then either print out the ballot and return the hardcopy to the elections office or fill the ballot out online, save it, and send it back as a file attachment. The e-mail to which the ballot is attached would, of course, have identifying characteristics on it but the file attachment (the ballot) would not. Procedures would need to be developed so that the elections official who stripped the attachment off the e-mail would not be able to link the two and so determine for whom the voter actually had voted. This could be done either through the use of software or through the use of a second file attachment so that the ballot is actually an anonymous file attached to an anonymous file that is attached to an e-mail message.

Beyond Voting—Deliberative Democracy: Innovative ICTs can revolutionize the town hall meeting mechanism for reconnecting citizens and government. Unlike de Tocqueville's observation on American government, direct citizen participation by American town hall democracy has been limited and less meaningful in today's representative government system. Computerized communication technologies, however, may offer a new face to the inadequate participatory techniques that are the most problematic administrative barriers to authentic participation identified by King et al. [1998]. More informed and educated citizens can adopt a wider citizen role, and then citizens can learn to care about the entire policy making process.

The systems of electronic town meetings have been developed based on technologies developed and utilized from the early seventies. During the 1970s and 1980s, forms of electronic town meetings were mainly conducted via cable TV and telephone, and the expectation of the citizen's roles was as a customer, meaning that government focused on satisfaction of citizen's demands to demonstrate higher responsiveness. After the late 1990s, networked computers replaced the previous forms of electronic town meetings, and the role of the citizens as an owner was focused on active responsibility for improving government performance along with a perfect right to inquire into administrative changes and reforms. Table 5.1 summarizes the empowered citizen participation in the development of the electronic town hall meeting system.

In 1972, the first electronic town meeting technique was developed by Amitai Etzioni and his team at the Center for Policy Research in New York. A Multiple Input Network for Evaluating Reactions, Votes, and Attitudes (MINERVA) is a means for masses of citizens to communicate with each other using telephone, over-the-air TV, and radio [Etzioni, 1972]. The guiding principle was the division of the citizenry into four levels of the response system—small groups (up to 30 persons); small communities (300–2,000 persons); intermediate communities (6,000–40,000 persons); and societal entities—in order to generate an effective dialogue

Table 5.1 The Development of Electronic Town Meetings with Citizens' Roles

Phase	*1st Generation*	*2nd Generation*
Feature	Telecommunicating	Computer networking
Applications	Cable TV, telephone, videotext	Networked computer, Internet
Interaction Type	Responsiveness/Hierachy	Collaboration/Holarchy
Citizens' Role	Customer	Owners
Examples	- MINERVA, NY - QUBE in Columbia, OH - OPEN-Net, NC - Vision 20/20 in Savannah, GA	- PEN in Santa Monica, CA - The 21st Century Town Meeting in District of Columbia

and consensus-based public policies. Although Etzioni asserted the success of the MINERVA approach, a few shortcomings existed such as participants' unequal access time and the low participation rate. In the late 1970s, the Honolulu Electronic Town Meeting was initiated to gather citizen feedback using telephone or mail-in ballots from the local newspaper during or after the public affairs television programs. Another case of electronic town meetings is the QUBE system, which is the interactive two-way cable system launched in Columbus, Ohio in 1977, to create a faster method of communication for groups via a box of push-buttons. QUBE's electronic town hall eventually failed due to the low rate of the participation, politicians' low level of attention to viewers' votes, and costs of subscribing to QUBE. OPEN-Net (Open Public Events Network) in North Carolina has engaged citizens in a lively communication with the government through effective communication strategies via cable and the Internet since 1979. The system provided a series of electronic town halls in a weekly three-hour program where the first half of a videotaped meeting is aired. After this, citizens can place calls directly to policy-makers. In the 1980s, similar electronic town meeting initiatives were conducted: Santa Barbara's electronic town meeting to gain citizen opinions on the water crisis in the spring of 1990, Savannah's Vision 20/20 to discuss Savannah's future with city officials and citizens in April of 1990, and Seattle's 30-minute electronic town meeting to obtain citizens' immediate feedback through voice mail and the Internet.

With the advent of computer network applications from the late 1990s, electronic town meetings were able to overcome the old communication limitations such as limited access, unequal access time, and the low rate of participation during the 1970s and 1980s, and provide active and genuine citizen participation. For example, the 21st Century Town Meeting, developed by AmericaSpeaks, can offer an innovative way of citizen participation in order to set priorities for the District of Columbia via networked computers, electronic keypads, and video screens. During *Citizen Summit III,* held in November 2003, about 2,800 residents recruited through various organized outreach efforts discussed three important challenges to the District and identified priorities for providing high quality services to residents. These priorities contributed to shaping the city's budget and strategic plan, and inputs from the Citizen Summit eventually enhanced the city's accountability for implementing those priorities [Williams, 2003]. Although the AmericaSpeaks model is still inherently limited, the model can cultivate direct citizen participation culture and establish an authentic citizen's role in the decision-making process.

5.3 The Architecture of an Electronic Democracy

With their distinct superiority in transmission capability, flexibility, interactivity, and low cost, computer networks have found niches in government and have so made government more open and accessible. The predictions that progress in ICTs could eventually transform the U.S. representative system into a direct democracy, made by futurist John Naisbitt in his book *Megatrends*, seem somewhat quaint from our perspective of an age in which the first computer networks to put government online have already been implemented. But a baby's crawling stage also seems quaint after that baby has taken his or her first steps. By focusing on this quaintness, we are, however, focusing on past performance rather than future promise and ignoring the possibility that those first steps could lead to long-distance hiking, climbing ladders, or running the marathon.

As the development and management of computer networks are becoming the nucleus of public management and IT policy areas, challenges presented to government are getting more complicated and cross boundaries of all subjects. Challenges are not just related to only the lack of financial recourses and technical capacities of public administrators [Scavo and Shi, 1999] but also the high volume of social demands, such as more interactions and engagement with their governments and political institutions. Government openness requires encompassing the supply aspect and the demand aspect of computer networking, as the system introduces a new dimension of citizen participation. Along the line, public administrators need to master up-to-the-minute technology skills and adapt a new, deliberative environment in which they may not feel as comfortable as they did in the past. The following sections address some major issues involved in designing and operating electronic democracy, and discuss the implications for public administrators.

5.3.1 Network Functionality

Electronic democracy practices demand the use of different electronic techniques, which can give greater reality to the democratic experiences through multiple platforms. New technical applications assist greater citizen interaction with government and greater citizen participation in the policy and political process. The barest minimum form of a computer networking system that might serve as a reliable source for public information and an effective means for deliberative participation would consist of the five computer network application clusters summarized in Table 5.2.

The information dissemination dimension can be divided into two functions: one-way and two-way disseminations. While citizens can passively access information on policies and operation of government using the one-way dissemination mechanism, the active dissemination tools can provide customized, prompt information delivery based on citizen's demand. The baseline phase of computer networks is the Web interface, which is a vehicle for information dissemination, citizen-government interaction, and citizen participation. The Web interface consists of read-only Web pages mainly serving as one-way information dissemination for informing citizens. Multipurpose Web portals are designed to provide a higher access to government information and collaborative information sharing. The newsletter, or e-mail list, or e-mail alter application provides more active and customized information distribution to target groups of citizens. The next dimension, communication, offers a direct communication channel for both citizens and public administrators using the e-mail application. A proper e-mail response policy is required in an effective and timely manner. The last dimension, participation, aims to improve direct citizen participation by passive and active mechanisms. Citizens can network horizontally with others to share their opinions, and also interact vertically with government to engage in decision processes by active channels.

Table 5.2 Computer Networking Systems of E-Democracy

Dimension	*Application*	*Function*	*Features*
Dissemination	Web interface Read-only Web	One-way channel	-Navigability of the Web sites -Accessibility of information -Links to relevant websites
	Newsletter E-mail list E-mail alter	Active channel	-Timely updated information -Customized information delivery
Communication	E-mail	Two-way channel	-Direct communication with key officials -Prompt response
Participation	Bulletin board Online poll E-survey	Passive channel	-Availability of citizens' complaints and suggestions -Quick results of polls and surveys -Site effectiveness and functionality
	E-forum E-town hall meeting E-voting E-rule making	Active channel (many-to-many)	-Horizontal interaction between citizens -Vertical interaction between citizens and government -Referenda

Besides these computer networking structures, public administrators should be concerned with critical issues of information: content usability, reliability and consistency, and security and privacy. The content usability issue addresses the usefulness of public information in the websites. To encourage citizen involvement an appropriate level of information disclosure is required to be informed citizens, as security and privacy will allow:* Information on the agency's services; programs; policies or regulations; names, telephone numbers, and email addresses of its key personnel; job opportunities; important events associated with the organization; and so forth. As a tool of citizen participation, a public information system should also provide information on elections and candidates.

The second issue is how reliable and consistent public information is provided. To satisfy citizens' information seeking from the Web sites, information should be organized and archived in a reliable, constant, and systematic manner through a menu or search function. Otherwise, anybody can be overwhelmed by an overabundance of information. An informative public information system depends on a well-designed and well-kept database. The same rule can be applied to bulletin boards, where conversations or exchanges should be separated along topic lines.

* The original version of this chapter was more sanguine about the openness of computer networks. The September 11th terrorist attacks on the US and the resulting war on terrorism have changed our thinking on this and we now put a higher premium on security considerations. One can see this evolution by comparing Scavo and Shi [1999] with Scavo [2003].

The third concern of digital networking requires the confidence of security and privacy, because the use of the system is amplified in any process of decision-making and in the political discourse. Integrity and confidentiality of the decision-making process should be flawlessly guaranteed along with the broad application of digital networking. Advanced technology can secure and privatize the networking system through appropriate tools such as data protection, the public key infrastructure (PKI), the electronic signature, and authentication. The system should be able to protect itself from cyber vandalism; to detect malicious software such as viruses, worms, Trojan horses, and spyware; to maintain the confidentiality of communication; to verify personal identification; and to shield transmission activities from interception or eavesdropping. Due to a certain level of privacy for misuse of data, public administrators also should be concerned about sharing and storing data between different government agencies. If government plans to provide horizontal integrated services across different functions, the question is how to achieve this with a certain level of security and privacy. Great progress has been made toward achieving these goals and yet their final accomplishment has not yet been attained. What is most important is that public managers should not leave the job of security to technicians alone. Technicians often want to design a system that is technically secure but can be fooled in simple "human" ways—one person using another's personal identification number, for example. After all, the most securely locked door can be opened by a talented locksmith, but it would require far more expertise to fool an alert human guard stationed at the same door.

5.3.2 Fair and Equitable Access

Electronic democracy requires e-citizenship in which the individual Internet users should play an active role in the democratic process by informing government issues and participating online discussion forums. E-democracy can be useful and effective for those who are informed, educated, and encouraged to engage in the participatory process. In this respect, electronic democracy must be universally accessible, something that is not yet attainable even in the most technologically advanced countries on earth. Internet access in the United States still tends to be unequally distributed, although the severity of that inequality has been dropping in recent years. The level of access and usage varies by racial backgrounds, family incomes, educational levels, residential areas, age, and geographic locations. Across these groups, African Americans (45.2%); Hispanics (37.2%); individuals with less than a high school degree (15.5%); individuals with family income less than $25,000 per year (38%); and individuals over age 50 (44.8%) show disparities in comparison with the general population (58.7%) of U.S. Internet users [NTIA, 2004]. The gap between male and female use of the Internet had largely disappeared by 2000, although the NTIA study could not identify the degree of similarity in the pattern of Internet usage—what Web sites people access, etc.—for males and females.

Despite the widespread diffusion of computer and Internet use, the term "digital divide" still applies to ICT usage. The digital divide is not simply explained by have or have-not based on Internet Accessibility and the lack of computer-related hardware. As Warschauer [2003:2] criticizes "[T]he simple binary description of a divide fails to do justice to the complex reality of various people's differing access and usage of digital technology," actual use of Internet and computers should be focused on a different matter. Along these lines, the digital divide can be concerned with four types of access suggested by van Dijk [1999]: lack of elementary digital experience (mental access); no possession of computers and network connections (material access); lack of digital skills (skills access); and lack of significant usage opportunities (usage access).

From the perspective of government, the focus on access is barrier enough. Local governments in particular have been dealing with Internet access issues since the mid-1980s and various

communities have done less or more to reduce barriers to access. Some are attempting to tackle the problem of differential use in addition to differential access. One local government—Oakland County, Michigan—can serve as an example. Oakland County began implementation of its own fiber optics network—OAKNet—in 2002. OAKNet connects all local government agencies with county agencies and the county's information technology building. Local governments—cities, villages, townships—can connect to the network for minimal cost, reducing their own expenditure of resources in developing stand-alone sites while increasing network functionality and coordination. While the designers of the Oakland County system are committed to reducing the traditional social and economic barriers to access, they are also committed to reducing other barriers—"varying literacy levels, relevant online content, and institutional constraints on computer access and use" [Oakland County, 2002]. And the network also saves money—simple video conferencing between arrestees' holding cells and the court system has saved the court system alone some $1.5 million per year in transportation of prisoner costs [Government Computer News 2008].

It is clear that the easy questions of access have almost been answered through the lowered costs and increased availability of technology along with the de-linking of Internet usage from personal computers. The decline in the price of personal computers and Internet connections has put both in the reach of lower income families. The emphasis that schools are putting on Internet usage and computer literacy has increased the necessity of all families with children to have Internet connections from home. For those families who cannot have such connections, public libraries, Internet cafes, public kiosks, etc., all provide free or low-cost Internet usage. The Internet becoming independent of the personal computer is no longer simply a promise; Internet connections via television are possible in many areas, and individuals around the country access email and other Internet services via personal digital assistants (PDAs), cellular telephones, and all kinds of other devices. And various software programs and hardware components are being engineered to allow individuals using computers to interact with those who do not have computer access.* So the issues associated with differential access because of socioeconomic status are on the verge of being solved. But the more difficult access questions—how the Internet is actually used by different socioeconomic groups; how hardware can be made accessible to the disabled; how illiterate people can attain a level of literacy necessary to make use of the Internet, differences between relatively slow dialup access and quicker broadband access, etc.—are far from being solved. Some, in fact, are only beginning to be addressed.

To investigate some of these issues, Brown University's Center for Public Policy has conducted a survey of government Web sites each year since 2000. Its most recent report has been published as West [2008]. This report shows that while both federal and state government Web sites have improved their accessibility over the last seven years to the disabled, to those with low literacy, and to those who speak foreign languages, there is still great room for improvement. For example, at a time when the typical American is reading at the 8th grade level, only 13% of the 1,537 state and federal government websites examined read at this level or below, as measured by the Fleisch-Kincaid test used by the U.S. Department of Defense as a rest of readability. The vast majority of sites (64%) read at the 12th grade level. Even agencies that were potentially geared toward users with low levels of education (Corrections, for example) did not have Web sites that were readable by people with less than a 12th grade education. Disability access was measured using

* For example, software has been available for many years that allow computers to send faxes directly to fax machines. Recently, however several vendors have introduced the reverse—fax machines that will scan pages and send the file as email to a recipient.

the Wave test, developed by the Center for Persons with Disabilities at Utah State University. Each Web site was evaluated against Priority Level One standards developed by the World Wide Web Consortium (W3C) standard. In 2007, some 25% of federal Web sites and 19% of state Web sites passed the Wave test. As for foreign language access to Web sites, some 40% of all federal Web sites made some accommodation for non-English speakers (from providing a text translation to free translation software). This was up from some 4% in 2000.

5.3.3 The Spirit of Community

Computer networking is reshaping community-informatic infrastructures for civic engagement and enables citizens to connect horizontally in their communities. The phrase "spirit of community" means the degree to which members of a community are concerned about one another, even though they differ in every conceivable way, and the degree to which they respect different opinions. In certain ways, the way we use this phrase compares with Putnam's [2000] use of the phrase "social capital." This may be an attitude or it may be an affectation, but it is clear that people sharing a strong spirit of community will have more social interaction and mutual understanding, two critical conditions for any democracy to work well. This concept becomes relevant, here, because it is unclear how computer networks interact with the spirit of community. It is clear, from the case of Minnesota E-Democracy cited above, that the spirit of community exists in the e-mail lists in that venue. Is this because the ICT interaction has heightened participants' feelings of the spirit of community? Is it because the spirit of community in Minnesota—a state that political culture theorists would call an exemplar of moralistic political culture—pre-existed the establishment of Minnesota E-Democracy and so an experiment of this type would show less success elsewhere? Or has the Minnesota E-Democracy experiment actually eroded a pre-existing high sense of the spirit of community? These are questions that are unanswerable at the current time. What we can say about these questions is that there is no guarantee that ICTs will increase the spirit of community, and that there is at least the possibility that they may actually erode that spirit [Levine, 2002]. When people go online, they have certain predispositions or needs—not everybody is interested in politics or views opposing their own. So while ICTs have done a wonderful job in bringing together a wealth of information and a wide range of perspectives, many people going online seek to interact only with those who share their own passions, ideologies, or points of view [Corrado and Firestone, 1996; Hill and Hughes, 1998]. The danger in this is the deterioration in concurrence across different sections of a community. As Thompson [1998] writes, "If citizens communicate with the like-minded more than before, what their minds like is more circumscribed than before."

Networks may also encourage incivility in political discourse. Internet communications tend to be more anonymous than are face-to-face communications [Bellamy and Hanewicz, 2001; Levine, 2002] and this can lead to inattention to social norms in Internet interactions. In Santa Monica, California, a small group of 30 to 40 heavy Internet users dominated the city's public information system and engaged in personal attacks and abusive behavior toward other users. In response to this, usage of the system declined [Docter and Dutton, 1998]. And yet seeking to police the Internet conversation raises serious First Amendment questions and also violates the spirit of the Internet as an anarchic environment. It is for this reason that system-wide informal norms such as those developed in the Minnesota E-Democracy project become so important. Rather than relying on external enforcement to ensure good behavior, the users themselves police the system, encouraging good behavior and disapproving of bad behavior. But, again, this raises questions about whether this form of enforcement would work anyplace else than in the moralistic

political culture of Minnesota. As Cain [2001: 1005] writes, "Whether the Internet eventually serves either democratic or anti-democratic purposes will depend on the institutions and norms that govern and protect Internet users and communities."

For public managers, regulation—whether external or internal—is only part of the solution. A more critical challenge is how to promote the spirit of community in their jurisdictions as electronic democracy spreads. For the technologies to perform positively, public managers may have to find ways to encourage more citizens to socialize with one another, to better understand one another, and to engage in a broader, more informed dialogue in a constructive manner. This task is more difficult than it appears, for such an effort will require public managers to assume the role of civic leaders, which is hardly compatible with the typical job description for their profession and the preoccupation with economic and organizational efficiency in their training. Yet, because we cannot find a local government agency that is willing to fund the position of civic leader, public managers may have to be convinced to expand or redefine their roles.

5.3.4 Closeness versus Deliberativeness

ICTs bring people closer to government, thus giving them more influence on public policymaking. The irony is that this closeness may also undermine the quality of decisions and pose threats to civil liberties. In electronic democracy, public managers may find more confusing voices in the public forums, less time for genuine and thoughtful deliberation in the decision-making process, and more pressure to respond instantaneously to public sentiment. Factions may find it easier to form a dominant coalition, but for now they have fewer logistical difficulties in coalition making [Thompson, 1998]. Presumably, all these changes may lead to more hasty decisions and less protection of minority interests, a scenario that not only scared the framers of the U.S. Constitution 200 years ago but also currently prompts many objections to electronic democracy.

The instantaneous nature of communications linked together via ICT can lead to both good and ill. One need only to remember the flood of rumors that filled the Internet in the immediate aftermath of the terrorist attacks on the United States on September 11, 2001. Network and cable television news played into the frenzied atmosphere by citing some the rumors—that a bomb had gone off in the U.S. Capitol; that President Bush had been attacked; etc.—as evidence that the attacks were part of a much larger plan. But the reduction in the delay from the time that news is generated and the time that it is received by the mass of the public is not intrinsically a bad thing nor are the "good old days" of long delays worth resurrecting. It is only necessary to recall that the final battle of the War of 1812—the Battle of New Orleans, a decisive victory by U.S. forces under the command of General Andrew Jackson—was fought several months after the Treaty of Ghent, which ended that war, was actually signed by U.S. and British negotiators. General Jackson and his British counterpart had not yet heard that the war was over.

There are several points to be made here. First, increasing the closeness of citizens to government officials has been a goal of many of the governmental reforms instituted in the United States since our foundation. Democratization and political equality are two prime values of our society and it is difficult for one to argue that effective government in the United States might require less democracy and more political inequality. Civil liberties and minority rights can be protected in an electronic democracy to the same degree that they have been protected throughout US history. The key to much of this is our conception of human nature. The framers of the U.S. Constitution did not view humans very optimistically and so concluded that barring external checks, one person or small group of people would seek to tyrannize others. A modern society of mature, educated, networked individuals may not need the same degree of external checks or may exist quite

nicely using internal checks (self-policing) rather than external checks. A technology as powerful as computer networking carries with it some responsibility for mature use. If immature, unethical, or inappropriate use of the Internet becomes rampant, calls for government regulation will increase and external checks may become necessary. At the current time, legislation regarding the regulation of spam, for example, is being considered by the U.S. Congress, and legislation attempting the regulate sexually explicit Web sites already has been passed (and found unconstitutional by the U.S. Supreme Court). The many-voiced anarchic nature of the Internet is threatened by these innocent-seeming efforts. One can imagine a future scenario of a heavily government regulated Internet resembling a "vast wasteland," the famous phrase that Federal Communications Commission head, Newton Minnow used to describe 1960s-era television. Even beyond this, cost considerations are becoming more important in ICT usage. West [2008] reports that government Web sites with advertisements, user fees, and/or premium fees has generally ranged between 1% and 2% from 2001 through 2008. Others [Dahlberg 2005, for example] have been more normative in their considerations of this, decrying corporate "colonization" of the Internet, largely as a result of cost factors.

A second, more practical point is that the role of public manager does not get any easier if electronic democracy succeeds in increasing the number of citizens who participate in government. Quite oppositely, this would put more pressure on them and their role in the policymaking process would become more critical. Public managers would become more involved in defining a meaningful public agenda, engaging in an informed dialogue with interested citizens, seeking to build understanding of complex public policy issues, and building increased respect for minorities. In recent years, there have been many calls for insulating public officials from public pressure—making the Burkean claim that public officials need to exercise their best judgment over public policy, only possibly being guided by the wishes of constituents. While some separation between public officials and the mass of the public is perhaps necessary, and may even be laudable, would it not be better if the sentiments conveyed to public officials by the mass was more informed rather than less, more deliberate rather than spontaneous, and more rational rather than emotional. All of this is possible with the use of online discussion groups, perhaps even organized by elected officials who truly care about the sentiments of their constituents. Public officials need to rethink the roles that they play in the public sphere, and one of their new tasks may be ensuring the quality of public discourse carried out on a public information system.

5.4 Conclusion

By discussing the possibilities of the establishment of electronic democracy in the United States, and by describing the first steps actually taken to implement e-democracy, this chapter has raised fundamental questions of democratic theory. The thorniest question raised is: If governments in the United States and elsewhere can seek to increase citizen participation through the use of computer networks, *should* they do so? Some public officials consider citizen participation to be on the "costs" side of any cost-benefit analysis—seeking public input only complicates the process of making decisions, falsely increases public expectations of what may result, and results in decisions that are delayed and often not as "good" if the public were not consulted in the first place. We find this perspective to be completely short-sighted. Involving the public in decision-making increases the possibility that the outcome of the decision-making process will be what the public wants, certainly a different but no less accurate a definition of "good" as that used previously.

It is clear that where government has experimented with ICT as a way to increase citizen participation, citizens have taken advantage of the outlets. Large numbers of citizens utilize Minnesota E-Democracy or the Seattle Community Network (http://www.scn.org) or their analogues in a number of cities and states around the US and in many foreign countries. Bulletin boards, electronic town meetings, chat rooms, e-mail lists, threaded discussions, and so forth have all become popular ways for citizens to communicate among themselves and with government officials wherever they have been organized. It is also clear that there is no long line of citizens demanding that government go online; it is typically government itself that has initiated the process and citizens who have enjoyed the benefits. Former Speaker of the U.S. House of Representatives Newt Gingrich was the driving force behind Thomas—the online Web site and database that put much of the U.S. House of Representatives online in the mid-1990s. Once Thomas was organized and running, members of Congress, lobbyists, congressional researchers, and ordinary citizens took advantage of the technology and the information that the technology made available. But it was a policy entrepreneur—here a government official—who opened the system up to the citizenry, not the citizenry who demanded it be opened.

It is also clear that problems of security and verification will plague any online public information system for many years. While it is possible to use technology to provide some safeguards for individuals using the systems, and to enforce some basic rules embedded into the system, all of these safeguards fail if individuals do not take sufficient precautions with their personal information. Even the most sophisticated passworded Web sites fail when individual users share their own passwords with others or make it easy for their passwords to be stolen by using the same one for several different websites—secure or not. It is simply impossible at the current time, and for the foreseeable future, for a computer system to guarantee that the person behind the mouse or keyboard is actually you and not somebody masquerading as you. If, for example, a local government institutionalized citizen feedback into its policymaking system (such that citizen comments on a bulletin board were used in the budgeting cycle), how could that government be sure that it was not simply one interest group who was sending messages to the bulletin board from a variety of email addresses? How could that government be sure that the interest group was not providing incentives for citizens to messages from their own email addresses? At the present time, most systems of verification are simply sophisticated versions of the honor system. What these systems do well, however, is to accomplish several precursors to complete verification—limiting individuals to one session in a discussion forum or one vote in a feedback session (or at least one vote from each e-mail address for which the individual is registered), requiring that all discussants sign in with a real name, phone number, or other identifying information, etc. Beyond this, ICTs, like all other forms of political participation virtual or physical, cannot guarantee that vote trading is not taking place. Often, however, critics of ICTs want to hold them to a higher standard, one that would make the designers guarantee the system is more secure than what it would replace. This is virtually impossible.

Our current experience with ICTs is not nearly as innovative and positive as some writers of just 10 or so years ago would have predicted. But it is also not nearly as apocalyptic as other writers warned. Government institutions and the population of the United States are both just beginning to come to grips with the changes that the Internet is making in society, government, and the relationship between the two. Predicting the future possibilities of establishing direct democracy through computer networking on the basis of current usage puts us in the same situation that Galston [1999] describes in predicting the future of television by examining television usage in 1952. "Scholars in 1952 studying (say) the social effects of television might have noted how neighbors crowded into a living room to watch the only set on the block, and they might

have drawn conclusions about the medium's community-reinforcing tendencies that would have seemed antique only a few years later" [Galston, 1999: 45]. How can one confidently predict that voting online might therefore lead to more individualism and help destroy the "vital public ritual that increases social solidarity and binds citizens together" [Valelly, 1999: 20]?

Our abilities to predict the future are often hampered by our imagination—on the one hand, we want to see the future as only incrementally different from the present; on the other hand, we want to see the future as a complete break with the present. In reality, the future is most likely a combination of both. Often, periods of incremental change lead to sudden discontinuous change in a system [Baumgartner and Jones, 1993; John, 2003]. One relevant example may be the incorporation of distance education (DE) techniques into the university classroom. While one might conceive DE to be a wholly different method of delivering university course content, one might also think of DE techniques (posting lecture notes and syllabi online, email discussion topics, etc.) as add-ons to the more traditional methods of delivery. As university professors experiment with DE techniques by adding them to their classroom courses (incremental change), they may also become more accepting of the idea of moving their courses wholly online in a completely different delivery model (discontinuous change). And when courses move completely online, university education can change dramatically.

One can foresee a similar movement in the use of ICT in the service of U.S. democracy. At first, the technology is merged into current systems and the uses found for it resemble those for more traditional technologies. As the new technology becomes more accepted, new uses are found for it. Eventually the system can reach the "tipping point" [Gladwell, 2002], where the system turns over into a new state. As we have discussed in this chapter, there are numerous problems with various aspects of that new state of the system, but those problems are not unsolvable and their mere presence, while possibly delaying the implementation of new technologies, cannot completely deter them. Just as major retailers have learned to cope with the fact that a majority of shoppers are going online to make their purchases, and just as those individual shopper preferences are remaking the retail universe in the United States, government must adapt to the changing behavior of citizens. As more and more citizens go online to conduct their daily business—paying bills, shopping, reading the news, chatting with friends and family, reading and sending e-mail, etc.—they will simply expect similar services to be offered by their governments. If government does not accommodate to these changing expectations, it risks being seen as irrelevant or obsolete in the modern world.

References

Alvarez, R., Nagler, J. The likely consequences of internet voting for political representation, *Loyola of Los Angeles Law Review*, 34, 1115–1152, 2001.

Baumgartner, F., Jones, B. *Agendas and Instability in American Politics*, Chicago: University of Chicago Press, 1993.

Bellamy, A., Hanewicz, C. An exploratory analysis of the social nature of internet addiction, *Electronic Journal of Sociology* 5(3), http://www.sociology.org/content/vol005.003/ia.html, 2001.

Bowman, L. Campaign sites miss web boat, news.com.com/2100-1023-964629.html, 2003.

Bruner, R. Fundraising expert says Dean's success an anomaly, www.uptospeed.com/archives/2003/07/22/fundraising_expert_says_Dean's_success_an_anomaly.html, 2003.

Burke, L. No voting opportunity for all. *Wired News*, www.wired.com/news/politics/0,1283,34914,00.html, 2000.

Cain, B. The internet in the (dis)service of democracy? *Loyola of Los Angeles Law Review*, 34, 1005–1021, 2001.

California Internet Voting Task Force. A report on the feasibility of internet voting, www.ss.ca.gov/executive/ivote/final_report.htm, 2000.

Center for Congressional and Presidential Studies. Public attitudes toward campaigns and campaign practices. http://www.american.edu/spa/ccps/pdffiles/publicattitudes.pdf, 2000.

Corrado, A, Firestone C, eds. *Elections in Cybersapce: Toward a New Era in American Politics*. Washington, DC: Aspen Institute, 1996.

Dahlberg, L. Extending the public sphere through cyberspace: The case of Minnesota E-Democracy. *First Monday*, http://firstmonday.org/issues/issue6_3/dahlberg/index.html, 2001.

Dahlberg, L. The corporate colonization of online attention and the marginalization of critical communication? *Journal of Communication Inquiry*, 29:2, 160–180, April, 2005.

Docter S, Dutton W. The first amendment online: Santa Monica's public electronic network. In: Tsagarousianou R, Tambini D, Bryan C, eds. *Cyberdemocracy: Technology, Cities and Civic Networks*, New York: Routledge, 1998: 125–151.

Downs, A. *An Economic Theory of Democracy*. New York: Harper & Brothers, 1957.

Drinkard, J., Lawrence, J. Online, off and running: web a new campaign front, *USA Today*, usatoday.printthis.clickability.com/pt/cpt/action=cpt&expire=&urlID=6911704, 2003

Elliot, D. Examining internet voting in Washington. www.electioncenter.org/Voting/InetVotingWhitePaper.html, 2001.

Etzioni, A. Minerva: An electronic town hall. *Policy Sciences* 3, 457–474. 1972.

Galdwell, M. *The Tipping Point: How Little Things Can Make a Big Difference*, New York: Little, Brown, and Company, 2002.

Galston, E. (How) does the internet affect community? Some speculation in search of evidence. In: Kamarck, D., Nye, J. *Democracy.com? Governance in a Networked World*, Hollis, NH: Hollis Publishing Company 1998: 45–61.

Garson, D. Information systems, politics, and government: Leading theoretical perspectives. In Garson, D. *Handbook of Public Information Systems*, 2nd Edition, Boca Raton: Taylor and Francis, 665–688.

Greengard, S. The first internet president. *Communications of the ACM*, 52:2, 16–18, February, 2009.

Greenspan, R. Two-thirds hit the net. *CyberAtlas,* http://cyberatlas.internet.com/big_picture/geographics/print/0,,5911_1011490,00.html, 2002.

Harris, S. Rock the vote, http://www.govexec.com/story_page_pf.cfm, 2004.

Hill KA, Hughes, JE. *Cyberpolitics: Citizen Activism in the Age of the Internet.* Lanham, MD: Rowan & Littlefield, 1998.

Institute for Politics, Democracy, and the Internet [IDPI]. Online campaigning 2002: A primer, http://www.ipdi.org/primer2002.pdf, 2003.

Internet Policy Institute [IPI]. Report of the national workshop on Internet voting: issues and research agenda, www.digitalgovernment.org/archive/library/doc/ipi_onlinevoting.jsp, 2001.

Internet World Stats. Usage and population statistics, Top 20 Countries with the Highest Number of Internet Users, http://www.internetworldstats.com/top20.htm, 2008.

John, P. Is there life after policy streams, advocacy coalitions, and punctuations: Using evolutionary theory to explain policy change? *Policy Studies Journal* 31(4), 481–498, 2003.

Kamarck, E. Campaigning on the internet in the elections of 1998. In: Kamarck, D., Nye, J. *Democracy.com? Governance in a Networked World*, Hollis, NH: Hollis Publishing Company 1998: 99–124.

King, C. S., Feltey, K. M., and Susel, B. O. The question of participation: Toward authentic public participation. *Public Administration Review*, 58, 317–327, 1998.

Levine, P. The internet and civil society, The International Media and Democracy Project, http://www.imdp.org/artman/publish/article_29.shtml, July 11, 2002.

Mariantes, L. Web may revolutionize fundraising, *Christian Science Monitor,* www.csmonitor.com/2003/p02s01-uspo.html, 2003.

Markoff, J. To email the president, download some patience. *Mercury News*, http://www.siliconvalley.com/mld/siliconvalley/6330165.htm, 2003.

Martin, R. Get wired, get votes, get cash. *CNN News Report*, cnnfn.com/hotstories/washun/9811/03/election, 1998.

Morris, D. Direct democracy and the internet. *Loyola of Los Angeles Law Review,* 34, 1033–1053, 2001.
Naisbitt, J. *Megatrends: Ten New Directions Transforming Our Lives*. New York: Warner Books, 1982.
National Telecommunications and Information Administration [NTIA]. A nation online: Entering the broadband age, http://www.ntia.doc.gov/reports/anol/index.html, September 2004.
Oakland County. Providing all county residents with access to egovernment services, www.co.oakland.mi.us/anout/access.html, 2002.
Pew Research Center. Modest increase in internet use for campaign 2002: Political sites gain, but major news sites still dominant, http://people-press.org/reports/display.php3/ReportID=169, 2003.
Putnam, R. *Bowling Alone: The Collapse and Revival of American Community*, New York: Simon and Schuster, 2000.
Quinn, S. OFA 2.0 and a stimulating "working session" in Maryland. http://www.fivethirtyeight.com/2009/02/ofa-20-and-stimulating-working-session.html. February 9, 2009.
Scavo, C. World Wide Web site design and use in public management. In: Garson, GD, ed. *Public Information Technology: Policy and Management Issues*, Hershey, PA, Idea Group Press, 2003: 299–330.
Scavo C, Shi, Y. World Wide Web site design and use in public management. In: Garson, GD, ed. *Information Technology and Computer Applications in Public Administration: Issues and Trends*, Hershey, PA: Idea Group Press, 1999: 246–266.
Schachter, H. L. *Reinventing Government or Reinventing Ourselves: The Role of Citizen Owners in Making a Better Government*, Albany, NY: SUNY Press, 1997.
Schneider, S., Foot, K. The 2004 US presidential election: A view from the web, www.politicalweb.info/2004/2004.html, 2003.
Silfry, M. OFA 2.0 still a work in (hidden) progress. http://techpresident.com/node/6612. December 14, 2008.
Smith, A and Raine, L. The internet and the 2008 election, Washington, DC: Pew Internet and American Life Project, http//www.pewinternet.org, June 15, 2008. *Sun Journal* (November 5, 2008) Dead battery caused delay of vote count, officials say, http://www.enctoday.com/news/battery_42823_nbsj__article.html/problem_officials.html.
Talbot, D. How Obama really did it: Social technology helped bring him to the brink of the presidency. *Technology Review*, 111:5, 78–83, Sept/Oct, 2008.
Thompson, D. James Madison on cyberdemocracy. In: Kamarck, D., Nye, J. *Democracy.com? Governance in a Networked World*, Hollis, NH: Hollis Publishing Company 1998: 35–42.
Tull, S. Howard Dean's presidential campaign raises $3.6 million online in first 90 days using Convio's internet software and services, http://www.charitychannel.com/printer_6419.shtml, 2003.
Turk. M. Participatory democracy demands participation. In: Fine, A.; Sifry, M.; Rasiej, A.; and Levy, J. *Rebooting America: Ideas for Redesigning American Democracy for the Internet Age*, http://rebooting.personaldemocracy.com/files/Rebooting_America.pdf, 2008.
Valelly, R. Voting alone: The case against virtual ballot boxes, *The New Republic*, 221(11/12), 20–22, September 13&20, 1999.
Van Dijk, Jan. *The Network Society, Social Aspects of New Media,* Thousand Oaks, CA: Sage, 1999.
Warschauer, M. Demystifying the digital divide: The simple binary notion of haves and have-nots does not compute. *Scientific American*, 289(2), 42–47, 2003.
West, D. State and federal electronic government in the United States. http://www.brookings.edu/~/media/Files/rc/reports/2008/0826_egovernment_west/0826_egovernment_west.pdf, 2008.
Williams, Anthony A. Citizen summit III: Real challenges, real choices. Columbia, DC: Executive Office of Neighborhood Action. 2003. http://cs.eona.dc.gov/frames/partGuide.shtm

Chapter 6

Revenge of the Pajama Surfers: The Inevitable Clash of E-Governance and Informational Privacy over Online Court Records

Charles N. Davis

CONTENTS

6.1 Introduction

The ubiquity of the Internet, and the ease with which judicial records can be accessed through e-governance systems, has state courts throughout the nation considering the proper role of online access to court records. While the personal computer offers great promise as a democratizing force, making judicial records as easy to access as any other governmental records, that ease of use gives rise to heightened concerns over the management of personal data contained in judicial records

once filed away in musty files accessed largely by legal elites. Rising public sensitivity over identity theft and informational privacy adds a new dimension to policymaking, as court administrators begin the difficult task of balancing access with the proper controls to protect certain exempted classes of information.

Further complicating matters is the legal reality that no branch of government faces more direct legal compulsion to provide access to its records than the judiciary. Unlike other governmental records, which are subject to a statutory right of access embodied in freedom of information laws, court records that are not deemed confidential by statute, rule, or court order have historically been open for public inspection, and the United States Supreme Court has squarely recognized a federal, common law right of access to judicial records,[1] and has hinted broadly at a constitutional right of access as well.[2] That right is not absolute, however; the Court has also stated that "every court has supervisory power over its own records and files."[3] To determine whether access to a judicial record may be denied, the court must employ a balancing test, determining whether the interest in access is outweighed by the interest favoring non-disclosure.[4]

The rapid growth and development of the Internet and related software has revolutionized the way in which governments produce, store, and disseminate information, altering the landscape for judicial records by placing greater weight than ever before on privacy interests in that balancing act. The rise of e-government has seen the personal computer dramatically alter the fundamental nature of the information created through litigation, as records once stored in obscure clerk's offices become digitized and posted on keyword-searchable Web sites. The growth of e-government in the courtroom thus raises many new and challenging policy issues, particularly on the proper balance to strike between public access and privacy rights. While there has always been inherent tension between the need for public access to certain information and the need to protect private or sensitive information, electronic court records raise the ante considerably by replacing difficult-to-use systems with the ubiquity of Internet access. Twenty-four hour access to court records by anyone, at any time, heightens concerns about the private nature of information captured in case files.

On the other hand, the movement toward e-government in the judiciary represents a quiet revolution in citizen access and government accountability, part of the growing reality of e-government. Public access to electronic court records provides a convenient way for the public to monitor the judicial system and ensure the fairness and equality of its operations. The public interest often is served by access to judicial records, and remote, anonymous access to court records empowers citizens to better scrutinize the judiciary free from the restraints of time and geography.

Courts thus must begin from a presumption that the overwhelming majority of judicial records (electronic or not) are open for public inspection. This contributes to the transparency of the courts, which the United States Supreme Court has closely linked to the legitimacy of the judiciary itself. The public must be able to see what courts are doing and how the courts work in order to build public confidence that everyone is treated the same before the law. Access also helps citizens and business interests adequately inform themselves about the legal dealings of others to protect themselves in their personal and corporate relationships.

Against this backdrop of competing values and goals, courts and legislative bodies across the United States have begun the task of implementing policies dictating access to electronic court records.[5] The policies vary widely, but all are influenced to some degree by a seminal 1989 United States Supreme Court opinion, *United States Department of Justice v. Reporters Committee for Freedom of the Press*, that forever recast the balance between access and privacy.

This article examines the rules that a number of municipal and state governments have adopted, or are adopting, in order to move court records online, and discusses the *Reporters Committee* decision and how its conceptualization of data privacy has resulted in the triumph of informational

privacy over the public interest in access to information. Using the rules themselves, the paper explores the dominant strands of privacy doctrine, illustrating the divide between privacy law and privacy policy regarding data protection statutes, freedom of information law exemptions, and other data controls.

6.2 The Legal Principle of Open Judicial Records

Court records are presumptively open to the public for the express purpose of assuring that the public can monitor the integrity of the judicial system. That right is not to complete and unfettered access, but is a rebuttable presumption of openness. In the cases that discuss the right to public access, there is no declaration that access must be provided with state-of-the-art tools. Instead, the message is that where there is a determination that information should be available for review, access to the information should be provided. It must be noted, however, that the right of access to judicial records predates the rise of e-government, and, thus, cannot be expected to provide much in the way of guidance for electronic access.

The courts generally have recognized a strong presumption in favor of access, holding that only compelling reasons justify denial of access to the case file.[6] Other courts have held that the common law presumption extends to any filed documents as well, absent compelling reasons for closure.[7]

In addition to the common law right of access, the U.S. Supreme Court has recognized a limited constitutional right of access under the First Amendment. In *Richmond Newspapers v. Virginia*,[8] the Court held that the First Amendment can be read as protecting a right to attend criminal trials, but the Court has never explicitly extended that right to documents.[9]

Whether it is common law or constitutional, the right of access to electronic information involves privacy interests that may justify restrictions on access. In recent years, privacy interests have expanded through a series of influential decisions whose catalyst was a 1989 Freedom of Information Act case. Though concerned with a range of records far broader than mere courthouse files, the U.S. Supreme Court's decision in *U.S. Department of Justice v. Reporters Committee for Freedom of the Press* fundamentally altered the jurisprudence concerning claims of privacy under the Freedom of Information Act.[10]

Reporters Committee presented a question crucial to the emergence of electronic access: Could an agency invoke privacy concerns to deny access to public records compiled electronically, in large part because they were compiled electronically? The case arose after a reporter filed a FOIA request asking for the FBI's "rap sheet" on a businessman identified by the Pennsylvania Crime Commission as an owner of a business dominated by organized-crime figures. The reporter was investigating because the company received defense contracts allegedly in exchange for political contributions to U.S. Rep. Daniel J. Flood.[11]

The FBI refused to release Charles Medico's rap sheet on privacy grounds, and the U.S. District Court for the District of Columbia granted the FBI's motion for summary judgment to dismiss the suit. The court held that the information was protected under the privacy provision of the FOIA's law enforcement exemption.[12] The U.S. Court of Appeals for the D.C. Circuit ruled in favor of the CBS journalist and Reporters Committee, reasoning that the government cannot claim a privacy interest in an FBI compilation of law enforcement agency records when those same records would be available as public records from the individual agencies themselves.[13]

The Department of Justice appealed to the Supreme Court, which balanced the individual's right of privacy against the public interest in disclosure and reversed the appellate court ruling,

thus allowing the FBI to withhold the information.[14] Writing for the Court, Justice John Paul Stevens said the FOIA's "central purpose is to ensure that the government's activities be opened to the sharp eye of public scrutiny, not that information about private citizens that happens to be in the warehouse of the government be so disclosed."[15] The Court reasoned that because a computerized compilation of an individual's rap sheet does not directly shed light on governmental performance, it falls "outside the ambit of the public interest that the FOIA was enacted to serve."[16]

The Court then turned to the privacy interests raised by e-government. According to the Court, a citizen possesses a protected privacy interest in the criminal history information because "plainly there is a vast difference between the public records that might be found after a diligent search of courthouse files, county archives, and local police stations throughout the country and a computerized summary located in a single clearinghouse of information."[17] Thus, individuals maintain a privacy interest in the "practical obscurity" of records.[18]

Taken literally, this means that public documents that are difficult or time consuming to locate assume some unspecified, but certainly heightened, level of privacy for no other reason than that they are obscure. And when those hard-to-find documents are assembled electronically, their "practical obscurity" implicates privacy interests in new ways.

The restructuring of the FOIA in *Reporters Committee* through the lens of the "core purpose" test, coupled with the Court's creation of "practical obscurity," has shifted the burden of proof in privacy-related cases. Instead of a presumption of openness, there now exists a requirement that the requester show that the information sought will reveal—directly—something about governmental operations.[19]

The concept of "practical obscurity" as an interest mitigating toward privacy is seldom discussed in these post-*Reporters Committee* cases, but the notion certainly thrives within the "central purpose" doctrine. The cases present an overall picture of a federal judiciary actively reigning in citizen access to the information collected and compiled by government. The fact that much of that information is compiled, stored and disseminated through computer networks leads to the logical conclusion that the more government documents created electronically, the greater the "practical obscurity" of the data. Despite the revolutionary ability of the computer, and of the Internet, to make information more readily available to the citizenry, "practical obscurity" stands ready to limit its vast potential to democratize information.

At the heart of "practical obscurity" is the Court's new categorical approach in cases involving privacy claims. To the *Reporters Committee* Court, information is either about individuals or about government; when the two categories blend, the result, in the Court's view, should almost always be non-disclosure. Neither life, nor data, is ever quite so simple. Judicial records are a fine example of that conundrum. The concept of "practical obscurity" embraced by the Court in *Reporters Committee* runs headlong into the far more historical First Amendment right of access to judicial records. The result is a mixed bag of state policies dictating electronic access to an important sector of e-government.

6.3 The Federal Approach

In 2001, the federal courts issued guidelines for e-filing of court records.[20] The federal guidelines divided civil and criminal files for purposes of policymaking, declaring the presumption of a right to access for civil filings regardless of medium. Thus, all civil filings and related e-documents are presumptively open, save for a single class of records that might be restricted based on the identity of the individual and/or the nature of the document being sought.[21]

Criminal files, however, fall squarely into the practical obscurity model. The federal courts recommended that criminal files not be made accessible electronically at all, citing the storage problems of criminal filings and the safety and security problems attendant to them.[22] The committee also cited the danger of defendants and others being intimidated by co-defendants with easy access to information about the level of cooperation by other defendants.[23] The federal courts have since relented somewhat, beginning a pilot test of criminal file access in eleven federal courts.[24] If successful, the pilot would be expanded throughout the federal judiciary.

Several states have moved further along the policymaking continuum, falling generally within each of the two policy models.[25] The New Jersey Supreme Court in 1998 became one of the first states to comprehensively address e-government policy with regard to court records. The court created the Public Access Subcommittee in 1996 to develop an electronic access policy, and after two years of research, the subcommittee concluded that releasing court records over the Internet did not violate privacy rights.[26] Recommendation 5 of the report states, "After carefully considering the privacy concerns … privacy interests should neither preclude nor limit the public's right to access non-confidential information in electronic form." The comment to Recommendation 5 further states that the Subcommittee acknowledged "the troublesome issues raised by privacy advocates" but rejected "the notion that it is the role of the courts to restrict or suppress access to otherwise public information, gathered and maintained at public expense, based on the possibility that it might be used to the prejudice of individuals in certain cases."[27]

The subcommittee clearly favored the "public is public" model, further finding that requests for information in electronic form should be treated in the same manner as requests for paper copies, and that the judiciary should make information available in the form in which it is used, including data in bulk or batch form.[28] The subcommittee rejected the notion that restricting access to non-confidential court records is an effective solution to "a societal problem rooted in our information-fueled economy."[29] Instead, the subcommittee declared that the issue at stake was "whether it should attempt to control the 'troublesome' secondary uses of non-confidential information by making such information more difficult for everyone to find, access, and compile."[30] This it refused to do. The result is a policy that mandates electronic disclosure of nearly all court files, criminal and civil, unless protective orders are in place to shield the documents. Vermont's policy has developed along similar lines, as has Washington.[31]

6.4 State Electronic Access Policies

Recognizing the need to reconcile competing privacy and access interests, a variety of national organizations comprised of state and municipal court administrators initiated a massive study of the ways in which courts can implement electronic access systems while safeguarding privacy. Several organizations that work in and fund initiatives in the nation's state courts developed a project entitled Developing a Model Written Policy Governing Access to Court Records.[32] The State Justice Institute, staffed by the National Center for State Courts and the Justice Management Institute, developed a policy for state courts to use as a model in developing e-governance policies.[33]

Within the states themselves, several, including Maryland,[34] New York,[35] Colorado, Washington, and Vermont established independent committees to determine the best way in which to provide electronic access while preserving privacy.[36] As one would imagine, different states have handled electronic access in different ways. Some states, such as New Jersey and Florida, actually briefly curtailed their efforts to make records available electronically due to both budgetary constraints and privacy concerns. And while the states' practices and policies on access to electronic court records

may differ, they all grapple with the same issues and concerns regarding privacy, cost, and sensitive information. A look at several states' policies reveals the influence of *Reporters Committee* on emerging e-government policy involving access to electronic public records.

State court systems around the country have undertaken a variety of processes to upgrade their written court record access policies to address electronic access issues. Court organizations took the lead in developing guidelines; the CCJ/COSCA Guidelines remain the guidepost on which states are constructing electronic access policies. The CCJ/COSCA Guidelines have proven durable and influential.[37] The Guidelines served as a framework for court access policies in Indiana, Maryland, and South Dakota.[38] The Guidelines have been consulted in at least nine other states: Alaska, Colorado, Minnesota, New York, Ohio, Pennsylvania, Indiana, Arkansas, and Virginia.[39] As one trio of scholars noted, "under way now is a revolution in judicial access comparable in scale to the advent of FOI law."[40]

The CCJ/COSCA Guidelines begin with the proposition that court records are presumptively open, that format should not predicate access, and that while some information might be precluded from public access, such exclusions should be made consistently and should not be subject to subjective personal interpretations of potential harms.[41] The guidelines also state that the decision to grant or deny access to court records should not depend upon the nature of the request.[42] This is an important policy consideration, for it frustrates the creation of conditional or tiered access policies in which "approved" requesters enjoy greater access than other, non-professional or non-legal requesters.

The guidelines document many of the vexing issues surrounding electronic access to court records, some of which must be addressed by policy makers at all levels in the formulation of e-government access policy. While mindful of the many benefits of widespread public access to court records in electronic form, the guidelines are also careful to ensure efficiency on the part of the courts, and to protect individual privacy rights and the interests of businesses in protecting proprietary business information. By beginning with the presumption of openness and then balancing countervailing interests, the guidelines serve as a useful starting point for development of e-government access policy.

From that initial proposition, the guidelines begin to define central terms such as "court records," "public," "public access," and "judicial proceedings."[43] The definitions are purposefully broad so as to provide ample room for states to adjust accordingly. For example, the guidelines define "court records" as documents falling within three categories:

1. Documents filed or lodged with the court in proceedings or as part of the case file. Documents in this category include exhibits offered during hearings and trials, and information before the court in making its decision.
2. Information generated by the court proceedings, including information from the Court Administrator and the clerk of court, before temporary judges or referees.
3. Information related to the operation of the court. This includes informal policies, memoranda and correspondence, and court budget and fiscal records as well as other data which makes the internal policy of the court more transparent.[44]

The guidelines then move from the general presumption of openness to a discussion of the conditions necessary for non-disclosure. First, the guidelines state that when access is denied, the requestor must at least be informed of the existence of the information.[45] In order to facilitate this exchange, the guidelines suggest the use of generic descriptions, captions, or pseudonyms, so that the description of non-disclosable information does not inadvertently disclose the information.

This is an area of some contention, as many electronic systems lack the dexterity to process such requests. Where it is possible, however, such masked indices could help provide the necessary accountability with regard to non-disclosure. Future electronic record-keeping systems should incorporate this goal, or the result will be denials that serve to mask the very existence of information, a scenario to be avoided in all but the most sensitive of information requests.

The next section of the guidelines discusses another contentious issue, that of making access to electronic records conditional upon establishment of identity through tracking users.[46] Traditionally, public records access has been predicated upon the notion that requesters need not disclose their identity nor the purpose of their request. The reasons for such conditions are obvious: If a right of access exists for all citizens, then the record keeper has no right to ask for such information, which could chill requesters leery of official or non-official retribution, tracking, or other responses from the record keeper.

Today's post-September 11 security environment has many policy makers reevaluating non-conditional access, and the guidelines note that such decisions must be made at the local level and thus might vary from jurisdiction to jurisdiction. The guidelines note that the benefits of tracking requesters must be balanced against the inconvenience, intrusiveness, and potential chilling effect of such policies, not to mention the added cost.[47]

The guidelines then turn to the task of suggesting which documents merit which level of electronic access. Section 4.20 of the guidelines begins with the less-sensitive documents, which should be made remotely accessible almost without exception: indices to cases filed; listings of new cases, including the names of litigants; docket calendars; hearing times and locations; and judgments, orders, and decrees.[48] All could be protected, but only by court order; otherwise, the presumption of access would dictate remote electronic access to all such documents.

The guidelines then address the issue of bulk distribution of judicial records and requests for compiled information, the request addressed earlier by the U.S. Supreme Court in *Reporters Committee*. Rather than taking a categorical yes-or-no approach to such data, the guidelines recommend that states recognize the unique time and cost factors inherent in such request but to not reject them out of hand on the basis of time and cost. Instead, the guidelines urge states to consider whether the request is "an appropriate use of public resources,"[49] an amorphous standard but nonetheless an improvement on *Reporters Committee*'s far narrower approach.

In addition, the guidelines allow bulk distribution and compiled information not generally accessible where the information is to be used for "scholarly, journalistic political, governmental, research, evaluation or statistical purposes,"[50] a vast improvement over the *Reporters Committee* dicta cognizant of the public interest so often attendant to requests for electronic court records.

Finally, the guidelines turn to two broad areas of more sensitive record content. The first involves records relating to children, mental health proceedings, and sterilization proceedings; the second, identifying information of victims, witnesses, informants, and jurors.[51] It is at this point that the guidelines begin to reflect *Reporters Committee* standards, at least with regard to individual privacy interests. Several strands of *Reporters Committee* logic appear in the guidelines, and clearly inform the recommendations.

First, in addressing the identifying data included in electronic court records, the guidelines recommend that states consider whether some categories of information might instead only be accessible at a court facility within the jurisdiction.[52] This clearly harkens back to the "practical obscurity" of *Reporters Committee*, in which privacy is maintained thanks to the inefficiencies of paper-based systems.

The guidelines recommend placing such documents in a "restricted access" field, meaning that requesters could ask for access—a definite improvement over blanket exemptions—and states that

courts would then be asked to evaluate the risk of injury to individuals, individual privacy rights, trade secrets, and public safety.[53] While recommending that courts employ the least restrictive means necessary, they do not explicitly recognize the public interest in such records, nor do they acknowledge the possibility that privacy interests might be outweighed by such interests.

The "restricted files" approach has much to recommend, however. As technology advances, courts will be better able to screen identifiers and automate privacy protections, and thus can move greater numbers of records into the public domain as redaction becomes easier. The guidelines suggest, at least halfheartedly, that a subscription-based approach as an alternative to the "restricted files" approach might exist, but the committee saw several problems with that as well, including cost and access to members of the general public.[54]

Overall, though, the CCJ/COSCA Guidelines represent the state of play in electronic access issues and highlight all of the critical issues. They recommend a presumption of openness and represent a step forward from the use of exemptions or judicial pronouncements that give short shrift to redaction as a protector of privacy interests. They leave states with ample room to develop more expansive policy. Maryland, in fact, did exactly that as its committee made no recommendation on subscription access and saw no need to protect privacy interest beyond that afforded by sealed court records and existing statutory provisions elsewhere in state law.[55]

The bottom line is that the CCJ/COSCA Guidelines quite rightly leave privacy determinations up to the states and recommend that courts address them on a case-by-case basis. The committee's guidelines are no more than recommendations, but they do signal a commitment to greater access to electronic court files. The significant step forward from a policy perspective is that records to which access has been prohibited are not forever closed. Indeed, any member of the public may apply for access to such records, initiating a determination of privacy interests to examine whether there are sufficient grounds to continue prohibiting access.[56] The question, then, is whether courts will implement the guidelines in meaningful fashion or simply revert to the categorical privacy protections of the *Reporters Committee* "practical obscurity" doctrine.

Arkansas joined that revolution in 2004, beginning a nearly three-year process of drafting a court record access policy. In 2006, the Committee on Automation referred to the Arkansas Supreme Court, the Task Force's final product, the Proposed Administrative Order on Access to Court Records, which was adopted by the Arkansas Supreme Court in 2007.[57] The final order[58] is a textbook example of the difficulties inherent in balancing privacy and access while fostering greater availability of judicial records.

The purposes of the Arkansas order mirror those in the CCJ/COSCA Guidelines, setting forth a broad proclamation that court records be widely and easily accessible. As in all judicial access policies, the most important distinction among court records, referenced again and again in the Order, is the distinction between records that are, and records that are not, subject to public disclosure. The Order divides records into two categories: case records and administrative records. Just as FOI law is only as effective as its exemptions are narrow, the general presumption of the access rule set out in the Order is only as meaningful as its exemptions are restrained.[59]

Arkansas began by excluding records that have been excluded from public disclosure already under existing statutory or regulatory policy. The second class of exempted records were identified as those that could be narrowly drawn and justified by compelling interests. Three of the remaining six exemptions listed in section VII(A), exemptions from case records access, are justified on grounds analogous to statutory or regulatory exclusion. First, the provision addressing "information about cases expunged or sealed" reflects the policy that such cases are to be not only confidential and redacted from public disclosures, but also "invisible" to the public. Second, the exemption for judicial deliberative materials—for example, conference notes and draft opinions—obeys the near

absolute rule of the common law. Third, the exemption for a rule or order of court allows for case-by-case common law confidentiality orders either under authorities outside the Proposed Order or according to court orders grounded in the common law.[60]

Two other exemptions listed in section VII(A) are common to almost all state electronic access policies following the CCJ/COSCA Guidelines. First, the exemption for social security numbers pays tribute to federal law, which, despite popular misconception, prohibits disclosure of social security numbers by state and local officials in only limited circumstances. Second, the exemption for financial account numbers is supported by the Guidelines and has generated no opposition from access advocates in any state adopting electronic access policies.[61]

While adequately protecting privacy interests within the Order, Arkansas policymakers nevertheless established a broad electronic access policy that sets the stage for a broad right of access to electronic court records. The Guidelines define "court records" neutrally as to medium, setting out a general policy of medium neutrality in access to judicial records.[62] Like the Guidelines, the Order adopts medium neutrality as part of the section IV general access rule, and none of the exemptions derives facially from a medium distinction. The Order goes a long way toward affirming the medium neutrality norm, notwithstanding future developments with respect to remote access.

Maryland began developing a policy for electronic access to judicial records in 2001, when Chief Judge Robert Bell of the Maryland Court of Appeals appointed a committee to study and make recommendations on electronic dissemination.[63] Maryland's efforts at formulating policy concerning electronic access still represent the most thorough and comprehensive review of the issues, and thus merit detailed discussion, in large part because they gave rise to a more formal cooperative between several administrative bodies serving court administrators.

On June 14, 2005, the Maryland Court of Appeals ordered that information which has historically been available in hard copy at courthouses will also be made available electronically.[64] The policy was the result of a process initiated by the state's adoption of the CCJ/COSCA Guidelines.[65] Maryland's policy neatly encapsulates the policy's privacy directives, stating in its general preamble that "a court record that is kept in electronic form is open to inspection to the same extent that the record would be open to inspection in paper form."[66]

Rather than create wholesale new exemptions to access, the Maryland order creates a system under which witnesses and victims in criminal matters can "opt out" of the system by petition.[67] Coupled with existing exemptions under Maryland law, the policy adequately protects the privacy interests of victims and witnesses without shutting off broad swaths of the public record. The order does an admirable job of recognizing both interests at play, yielding a bit to privacy while maintaining an overall level of access that many states would do well to mimic.

To fully understand Maryland's rules on electronic access, it is important to return to the final report and recommendations of the legislatively created Committee on Access to Court Records, which began the process in 2002 and issued its findings in 2004.[68] That document is remarkable for its depth of analysis as well as for the forward-thinking composition of the committee itself, which represented a wide range of opinions and viewpoints. The result is a policy that works for all involved.

6.5 Conclusion

Today, almost 25 years after the Reporters Committee decision, court systems stand at the crossroads of making vast amounts of public court record information easily accessible through

computerized databases and Internet use, while searching for dexterous ways to protect the privacy interests of litigants and third parties named in those records. Courts are facing the first series of many difficult policy choices with regard to e-government. Much of the discussion over electronic court records to date has focused on privacy issues. Future discussions may well merge privacy interests with security interests. Because new technology eliminates the built-in safeguards that have evolved over time in a paper system, the natural tension between the need for public access to case information and the need to protect certain case information has escalated dramatically.

Two policy models appear to be emerging in the various guidelines relating to electronic case files. The first position is reflective of pre-*Reporters Committee* ideals that court files are presumptively open under the First Amendment. The essence of this position, which one author has labeled the "public is public" model, lies in the proposition that the medium in which case files are stored does not affect the presumption of openness.[69] Under this model, current means of protecting privacy, such as protective orders and motions to seal, are adequate even in the e-government age. Advocates of this position suggest that litigants do not have the same expectation of privacy in court records that may apply to other information kept by the government.

A second model may properly be described as the "practical obscurity" school of thought, thanks to its reliance (stated or not) on *Reporters Committee* dicta to the effect that unrestricted Internet access to case files inherently compromises privacy by subjecting individuals to scrutiny not linked directly to the central purpose of access, i.e., the monitoring of government itself. While there may be no expectation of privacy in case file information, advocates of this model argue that there is an expectation of practical obscurity that will be eroded through the development of electronic case files.

Many of the arguments in favor of tiered, or conditional, or subscriber-based access to court records focus on the benefits of maintaining some control over the requester, but in their haste to establish prerequisites for access downplay the countervailing value of access itself. Likewise, privacy interests must be balanced against societal interests in access, in accountability, in transparency, values which form the basis of democratic governance.

E-government, particularly electronic court records, forms the intersection in which governmental operations most often collide with the lives of citizens. At the federal, state, and local levels, the courts represent the only venue imbued with First Amendment protections for access. While court administrators have set forth the general parameters for addressing the tension between public access and privacy interests in the context of court records, there remains much room for policy development that better reflects the primary value of transparency within the justice system.

End Notes

1. *Nixon v. Warner Communications, Inc.*, 435 U.S. 589, 597 (1978). The right is designed to promote public confidence in the judicial system and diminish the possibilities for injustice, perjury and fraud. See, e.g., *Richmond Newspapers v. Virginia*, 448 U.S. 555, 595 (1980); *Leucadia, Inc. v. Applied Extrusion Technology,* Inc., 998 F.2d 157, 161 (3d Cir. 1993).
2. The Supreme Court has not clearly stated that the First Amendment right of access in criminal proceedings extends to judicial records, but a number of lower federal courts have taken that position. See, e.g., *Washington Post v. Robinson*, 935 F.2d 282, 287–88 (D.C. Cir. 1991); *In re Search Warrant for Secretarial Area Outside Office of Gunn*, 855 F.2d 569, 573 (8th Cir. 1988).
3. *Nixon v. Warner Communications, Inc.*, 435 U.S. 598–599 (1978).
4. *Nixon v. Warner Communications, Inc.*, 435 U.S. 602 (1978). See also, *U.S. v. McVeigh*, 119 F.3d 806, 811 (10th Cir. 1997).

5. At least ten states have drafted or approved rules for access to electronic court records. See *Privacy & Electronic Access to Court Records Report and Recommendations Judicial Management Council.* Available at http://www.flcourts.org/pubinfo/documents/privact.pdf
6. See, e.g., *United States v. Beckham,* 789 F.2d 401, 409–15 (6th Cir. 1986); *F.T.C. v. Standard Financial Management Corp*., 830 F.2d 404, 408–10 (1st Cir. 1987).
7. See, e.g., *Pansy v. Borough of Stroudsburg*, 23 F.3d 772, 782 (3d Cir. 1994).
8. See, e.g., *Richmond Newspapers v. Virginia*, 448 U.S. 555, 575–78 (1980).
9. Several lower courts have extended Richmond Newspapers to grant a limited First Amendment right to various types of judicial records, both criminal and civil. See, e.g., *In re Continental Illinois Securities Litigation*, 732 F.2d 1302 (7th Cir. 1984); *Publicker Industries v. Cohen*, 733 F.2d j1059, 1067–70 (3d Cir. 1984).
10. *Deptartment of Justice v. Reporters Committee for Freedom of the Press*, 489 U.S. 749 (1989).
11. Flood, who eventually left office in disgrace, already was under investigation for corruption. See 489 U.S. at 770.
12. See 5 U.S.C. § 552 (b)7(C)(1994). The exemption states that the FOIA does not apply to matters that are "(7) records or information compiled for law enforcement purposes, but only to the extent that the production of such law enforcement records or information (C) could reasonably be expected to constitute an unwarranted invasion of personal privacy. Exemption 7(C) is one of two privacy exceptions to the FOIA. The other exception, Exemption 6, pertains to "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy." See 5 U.S.C. § 552 (b)6.
13. See *Reporters Comm. for Freedom of the Press v. U.S. Dep't of Justice*, 816 F.2d 730, 740 (1987).
14. See 489 U.S. at 772–73 (citing 425 U.S. at 372.)
15. See 489 U.S. at 774.
16. See 489 U.S. at 775.
17. See 489 U.S. at 764.
18. See 489 U.S. at 764.
19. See, e.g., Martin E. Halstuk and Charles N. Davis, "The Public Interest Be Damned : Lower Court Treatment of The Reporters Committee "Central Purpose" Reformulation," *Administrative Law Review*, Vol. 54, No. 3 (Fall 2002).
20. *Report on Privacy and Public Access to Electronic Case Files, Judicial Conference Committee in Court Administration & Case Management*, Agenda F-7 (Appendix A). June 26, 2001. Available at http://www.uscourts.gov/press-Releases/att81501.pdf
21. *Report on Privacy and Public Access to Electronic Case Files, Judicial Conference Committee in Court Administration & Case Management*, Agenda F-7 (Appendix A, A14). June 26, 2001. Available at http://www.uscourts.gov/press-Releases/att81501.pdf
22. *Report on Privacy and Public Access to Electronic Case Files, Judicial Conference Committee in Court Administration & Case Management*, Agenda F-7 (Appendix A, A15). June 26, 2001. Available at http://www.uscourts.gov/press-Releases/att81501.pdf.
23. *Report on Privacy and Public Access to Electronic Case Files, Judicial Conference Committee in Court Administration & Case Management*, Agenda F-7 (Appendix A, A15). June 26, 2001. Available at http://www.uscourts.gov/press-Releases/att81501.pdf.
24. Brian Krebs, "Federal Courts to Permit Web Access to Criminal Records," *Newsbytes*, May 7, 2002, available at http://www.courtaccess.org/federal/documents/federal%20courts%20to%20permit%20web%20access%20To%20criminal%20records.pdf.
25. More than a dozen states have drafted or are in the process of developing policies for electronic court records. See *Privacy & Electronic Access to Court Records Report & Recommendations, Judicial Management Council*. Available at http://www.flcourts.org/pubinfo/documents/privacy.pdf.
26. Supreme Court of New Jersey, *Report of the Public Access Subcommittee of the Judiciary Information Systems Policy Committee*, at 5 (1998). See also Susan Larson, "Public Access to Electronic Court Records and Competing Privacy Interests," *Judgelink*, at 1. Available at http://www.judgelink.org/Insights/2001/E-Records/.
27. Supreme Court of New Jersey, *Report of the Public Access Subcommittee of the Judiciary Information Systems Policy Committee*, at 6 (1998). See also Susan Larson, "Public Access to Electronic Court Records and

Competing Privacy Interests," *Judgelink*, at 1. Available at http://www.judgelink.org/Insights/2001/E-Records/.

28. Supreme Court of New Jersey, *Report of the Public Access Subcommittee of the Judiciary Information Systems Policy Committee*, at 5 (1998). See also Susan Larson, "Public Access to Electronic Court Records and Competing Privacy Interests," *Judgelink*, at 1. Available at http://www.judgelink.org/Insights/2001/E-Records/. See also Victoria Salzmann, "Are Public Records Really Public? The Collision Between the Right to Privacy and the Release of Public Courts Records Over the Internet," 52 Baylor L. Rev. 355 (2000), at 371.
29. Supreme Court of New Jersey, *Report of the Public Access Subcommittee of the Judiciary Information Systems Policy Committee*, at 69-71 (1998).
30. Supreme Court of New Jersey, *Report of the Public Access Subcommittee of the Judiciary Information Systems Policy Committee*, at 69-71 (1998).
31. See Vermont Supreme Court, *Dissemination of Electronic Case Records*, March 6, 2002. Available at http://www.vermontjudiciary.com/Resources/ComReports/pafinalrpt.htm; *Washington Supreme Court, General Rules of Application, Judicial Information Systems Committee Rules for Washington*, July 1, 1987. Available at http://www.courts.wa.gov/court_rules/?fa=court_rules.display&group=ga&set=jisc&ruleid=gajiscr15.
32. Martha Wade Steketee and Alan Carlson, *Developing CCJ/COSCA Guidelines for Public Access to Court Records: A National Project to Assist State Courts* (State Justice Institute, National Center for State Courts and the Justice Management Institute, 2002). Available at http://www.courtaccess.org/modelpolicy.
33. Public Access to Court Records: Implementing the CCJ/COSCA Guidelines, Final Project Report. Available at http://www.ncsconline.org/WC/Publications/Res_PriPub_PubAccCrtRcrds_FinalRpt.pdf.
34. Report of the Committee on Access to Court Records. Available at http://www.courts.state.md.us/access.
35. Public Access to Court Records: Implementing the CCJ/COSCA Guidelines, Final Project Report. Available at http://www.ncsconline.org/WC/Publications/Res_PriPub_PubAccCrtRcrds_FinalRpt.pdf.
36. The Center for Democracy and Technology has compiled an excellent 50-state synopsis of state efforts at e-filing, available at http://www.cdt.org/publications/020821courtrecords.shtml.
37. See, e.g., Gregory M. Silverman, "Rise of the Machines: Justice Information Systems and the Question of Public Access to Court Records over the Internet," *Washington Law Review*, Vol. 79, 204–06 (2004) (observing that state courts tend to follow Guidelines in rejecting location neutrality despite contrary trend at federal level).
38. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* vii–viii (2005).
39. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* vii–viii (2005).
40. Richard J. Peltz, Joi L. Leonard, and Amanda J. Andrews, "The Arkansas Proposal on Access to Court Records: Upgrading the Common Law with Electronic Freedom of Information Norms," *Arkansas Law Review*, Vol. 59, No. 2 (2006), 2.
41. Alan Carlson and Martha Wade Steketee, Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report 1-7 (2005).
42. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report 1-7 (2005). Alan Carlson & Martha Wade Steketee, Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* 1-7 (2005).
43. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* 12-15 (2005).
44. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* 14 (2005).
45. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* 22 (2005).
46. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* 25-26 (2005).
47. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* 26 (2005).

48. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* at Sec. 4.20 (1)-(e) (2005).
49. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* at Sec. 4.40 (b) (2005).
50. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* at Sec. 4.30 (b) & 4.40 (c)(1) (2005).
51. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* at 48-49 and at 48–49 (2005). These categories include other subsidiary information such as wills, psychological examination records, tax returns, and other identifiable financial information.
52. Alan Carlson and Martha Wade Steketee, P*ublic Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* at Sec. 4.50 (a), p.40 (2005).
53. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* at Sec. 4.70 (a)(1)-(4) (2005).
54. Alan Carlson and Martha Wade Steketee, *Public Access to Court Records: Implementing the CCJ/COSCA Guidelines: Final Project Report* at Sec. 4.50 (2005).
55. See *Report on Privacy and Public Access to Electronic Case Files, Judicial Conference Committee in Court Administration & Case Management*, at Sec. IV 3(a).
56. CCJ/COSCA Guidelines at Sec. 4.70(b)(1).
57. Arkansas Judiciary, Task Force on Public Access and Privacy, http://courts.state.ar.us/privacy/task_force.html (last visited Nov. 1, 2006). The Planning Committee minutes detail the creation of the Task Force. See Public Access to Court Records Planning Committee, Minutes (Aug. 25, 2004), http://courts.state.ar.us/privacy/pdf/minutes_08252004.pdf; Access to Court Records Planning Committee, Minutes (Sept. 20, 2004), http://courts.state.ar.us/privacy/pdf/minutes_09202004.pdf.
58. Task Force on Access to Court Records, Proposed Administrative Order (2006), available at http://courts.state.ar.us/pdf/propOrder_final_021706.pdf [hereinafter Final Order].
59. Task Force on Access to Court Records, Proposed Administrative Order (2006), available at http://courts.state.ar.us/pdf/propOrder_final_021706.pdf [hereinafter Final Order].
60. Task Force on Access to Court Records, Proposed Administrative Order (2006), available at http://courts.state.ar.us/pdf/propOrder_final_021706.pdf [hereinafter Final Order], at VII A.
61. Task Force on Access to Court Records, Proposed Administrative Order (2006), available at http://courts.state.ar.us/pdf/propOrder_final_021706.pdf [hereinafter Final Order].
62. Task Force on Access to Court Records, Proposed Administrative Order (2006), available at http://courts.state.ar.us/pdf/propOrder_final_021706.pdf [hereinafter Final Order], see Order, Part IV C.
63. *Report of the Committee on Access to Court Records, Maryland Court of Appeals*. Available at http://www.courts.state.md.us/access.
64. John Losinger, "Access to Court Records: Shifting the Privacy Burden Away from Witnesses and Victims," *Baltimore Law Review* Vol. 36 (Spring 2007) 419.
65. Peter A. Winn, "Online Court Records: Balancing Judicial Accountability and Privacy in an Age of Electronic Information," *Washington Law Review*, Vol. 79 (2004), 307, at 314–315.
66. See Md. R. 16-1009 (2006).
67. See Md. R. 16-1009 (2006) at A(3)(B).
68. Final Report of the Maryland Committee on Access to Courts Records, Feb. 5, 2002. Available at: http://www.courts.state.md.us/access/finalreport3-02.pdf
69. Robert Deyling, *Privacy and Access to Electronic Case Files in the Federal Courts*, Administrative Office of the United States Courts, Dec. 15, 1999, at 6. Available at http://www.uscourts.gov/privacyn.htm

Chapter 7

Intellectual Property for Public Managers

Roland J. Cole and Mary Jane Frisby

CONTENTS

7.1 Importance of Intellectual Property

Perhaps more than anything else, it is the incredible amount of competition that exists in virtually every marketplace that has been the driving force behind the rapid rise in the importance of intellectual property (IP). The tremendous amount of resources spent to develop new technologies or to launch an advertising campaign for a new product or service makes the protection of an invention, a copyrighted work, or a trademark vital to eventually receiving a return on the initial, necessary investment. Otherwise, competitors can spring up almost overnight, offering copies of your product without having to spend the resources you spent to develop the technology, or claiming to offer your product or service to your marketplace with allegedly lower prices, better service, or superior quality.

This highly competitive environment has created a keen awareness of the value of intellectual property and methods for its creation and protection both in the United States and around the world. Companies in every field are filing increasing numbers of patent applications each year. There are well over 400,000 patent applications filed in the United States each year and more than 1.7 million applications filed worldwide. Companies are also securing trademark protection for their trademarks and service marks before making any significant investment in marketing or advertising their products and services. Each year, there are more than $175 billion worth of goods and services sold by companies that had a license to sell intellectual property owned by someone else.

Along with this increased rate of creation of intellectual property comes an increase in disputes over infringement of intellectual property rights. Whereas patent infringement cases used to be fairly rare, now there are several thousand filed every year with the number increasing dramatically with each new year. This means that not only must one be vigilant about opportunities within their own organizations to create valuable intellectual property but one must also beware of infringing on the ever-increasing number of patents, trademarks, and other types of intellectual property that are owned by others.

7.2 A Bit of History

We often favor a historical approach to help us understand some of the nuances of current public policies. We find the approach especially helpful in the area of intellectual property, both because the subject has a much longer history than many at first think, and because the various types of intellectual property come from two very different traditions.

7.2.1 Competition among Equals

Trademarks, trade dress, the "right of publicity," and trade secrets have been the subject of legal action for centuries as both courts and legislatures have wrestled with what is "fair" competition and what is not. As one can imagine, various legal systems in various places have exerted more or less control over time. But the concept of what is "fair" among competitors and for the benefit of consumers has remained a central theme. These forms of intellectual property still retain a strong flavor of "bottom-up," case-by-case determination, even when national legislatures have adopted statutes providing for national registration (at least for trademarks), as the United States has done with the Lanham Act.

7.2.2 Permission from the King

Patents and copyrights have a very different history. The terms were first used to indicate permission from the king to carry on what were otherwise considered dangerous or subversive activities. To start a new business, whether or not based on a new technology, was often very disruptive to the social order, and the man (rarely woman) who wanted to do so often had to obtain "Letters Patent" for permission.

The right to copy and distribute written material (or even pictures) was also considered dangerous and thus required careful regulation. Only certain printers were given that right, and were subject to careful attention to their loyalty to the king or queen granting such permission.

7.2.3 To Stimulate Progress in the Arts and Sciences

Against this background, the policy reflected in the language of the U.S. Constitution that inventors and authors were to be rewarded with such rights, in order to promote science and the arts, was a dramatic change in the history of the terms patent and copyright. The United States was not the only country experimenting with such rights for creators rather than distributors, so it was not alone in this change, but it was a dramatic step nonetheless.

Thus, the more modern theory is not limiting activity to loyal subjects of the crown but encouraging creative activity. The inventor who is willing to share how to make his invention with the world (a patent becomes public once it is granted and requires the inventor to disclose the invention and the "best method" of practicing it) gets the "reward" of a legal right to keep others from practicing his invention for a period of time. Note, by the way, that the inventor may not have the right to practice his invention himself, as it may require the use of other patented inventions, etc. that are not available to him or her. But the inventor has the right to prevent others in the United States from making, using, selling, or offering to sell the patented invention and to prevent the importation of the patented invention into the United States.

In the case of inventions, only named individuals can be inventors, and a patent application can be denied and a granted patent revoked if the application does not list all such individuals and only such individuals. In modern corporate America, the individual inventors are usually employees under an employment agreement that requires them to assign their rights to their employer, but the system preserves the idea of individual inventors throughout the patent application process.

Similarly, the creator of an original written work (including computer software and even e-mails), musical composition, work of art, audiovisual work, architecture, or some combination of one or more of those, generally gets five exclusive rights to his or her creation: to reproduce it, to distribute it, to perform it publicly, to display it publicly, and to make revisions or adaptations of it (called "derivative works"). Under the doctrine of "moral rights," added to the U.S. system in 1989, the creator of certain works of visual art can also prevent certain forms of display or

alteration of the work that would cast aspersions on the work or the creator. The 1998 Digital Millennium Copyright Act added protections against the deletion or altering of certain information about copyrighted works (called "Copyright Management Information") done in furtherance of infringement, as well as protections for technological protection measures (such as encryption) used to control access to the copyrighted work. Unlike patent rights, copyright law provides more than the right to exclude others; the rights of copyright are affirmative rights belonging to the copyright owner to exercise the five basic the rights of copyright. However, in order to enforce these rights, the copyright owner must obtain a federal registration of the work, which includes providing two copies of the work to the U.S. Library of Congress and paying a fee.

The copyright law does not have the same deference to the individual that the patent law does. The copyright law allows a corporation (or other body) to be considered the "author" of certain copyrighted works with all (or almost all) of the same rights accorded to an individual author. In fact, the law deems certain acts of creation done by an employee whose job duties include such acts of creation to automatically become the property of the employer, even if there were no explicit employee agreement. These works are called "works made for hire."

The copyright law does have some deference to non-employee creators, however. Works made by independent contractors generally are not permitted to be treated as "works made for hire." Thus, absent a specific agreement signed by the creator, the person who pays for a creator who is not an employee to create a copyrightable work may be entitled to own a copy of the creation, but does *not* have any of the copyrights to that creation. If you buy a photographic portrait of yourself from a professional photographer, for instance, you own that copy, but ordinarily you have *no* right to make copies for your friends and family; you have to get permission from the photographer or, more likely, buy your copies from him or her.

Our patent and copyright law regimes do not give unfettered rights to owners, however. Both legal systems provide for several exceptions and limitations to the rights of owners, including "experimental" and "fair use" exceptions and "first sale" limitations.

7.2.4 The Results of History

The net result of this history is that patents and copyrights both have a flavor of top-down permission to individuals that is entirely different from the "bottom-up, trade competition" flavor of trademarks, trade secrets, and other similar intellectual property. These differences show up, in our view, in the way courts interpret statutes and decide cases. The differences are perhaps most dramatic in comparing technology protected by a patent versus technology protected by a trade secret. However, we think they also underlie other differences, such as those between how the courts treat the concept of copyright "expression" versus how the courts treat the concept of trademark "secondary meaning."

7.3 Types of Intellectual Property

7.3.1 Patents

Congress has the power to enact laws relating to patents by a grant in the Constitution, Article I, Section 8. The current patent laws are codified in Title 35 of the United States Code.

A patent is a grant by the federal government, giving the inventor or inventors of an "invention" the right to control the use, manufacture, and sale of the invention for a specified period of time. After the time period has expired, anyone is free to use, make, or sell the invention.

There are three types of patents: utility, design, and plant patents. Utility patents are by far the most common type of patent granted and is the type of patent with which most people are somewhat familiar.

A utility patent can be obtained to cover machines, articles of manufacture, compositions of matter, and methods or processes of accomplishing something useful. The invention also must be novel (no one has previously invented it, or the invention has not already been publicly disclosed for more than a year); useful (it has some utility); and non-obvious (it is not a simple, obvious change or modification to an existing invention). The term of a utility patent is typically 20 years from the date of filing of the application with the U.S. Patent and Trademark Office (USPTO).

In order to obtain a patent, an application is submitted that discloses all the specific details concerning the invention that would enable one of "ordinary skill in the art" to practice the invention. Typically a patent attorney or agent is used to prepare the application as there are strict requirements. In addition, the claims that are put into the application ultimately determine the scope of the patent granted and a patent attorney is usually needed to draft the claims for maximum coverage. The completed application is then filed with the USPTO along with fees that are determined by the number of claims and the entity status of the applicant. The invention now has "patent pending" status. Now the pending application must be "prosecuted" before the USPTO. This is usually done through the exchange of letters, amendments, etc., although sometimes it is done in person with the examiner assigned to your application. The applicant must also disclose all of the relevant prior art that he or she is aware of so the Patent Office can evaluate the novelty, non-obviousness, and utility of the claimed invention. The prosecution process will typically take anywhere from 15 months to 36 months with an average time of 18 to 24 months to obtain a patent. Much of the aspects of patent prosecution can now be done electronically. Note, however, that with the steady increase in patent application filings, the process takes longer and longer; in some art areas, such as software, it can take several years before there is any action by the Patent Office on the application. Once filed, a U.S. patent application can also be the basis for filing corresponding patent applications around the world. There is also a separate international patent filing procedure under the Patent Cooperation Treaty to expedite the prosecution of multiple applications in several countries.

The holder of a patent is responsible for "policing" the patent. This means that the USPTO does not enforce your patent or even watch for infringers of your patent. You must be vigilant, and if someone infringes your patent, you may have to sue them for patent infringement to stop the infringing activity and to receive any damages you might be entitled to receive. To preserve the ability to collect such damages, patent owners mark their patented products with a patent notice that identifies the patent number.

7.3.2 Trademarks, Service Marks, Trade Dress

Congress has the power to regulate interstate commerce by a grant in the Constitution, Article I, Section 8. Congress exercised this power by enacting the Lanham Act, which is the Federal statute dealing with trademarks, codified at Title 15 of the U.S. Code.

A trademark is one or more distinctive words, designs, and/or colors used to identify the source or origin of goods or services. Even sounds, smells, audiovisual images, distinctive packaging, and building designs have become trademarks. The owner of a trademark has the exclusive right to use the trademark to identify his products or services. A trademark used to identify services rather than goods is often called a service mark. The term "trade dress" refers to the overall impression created in the marketplace by goods or services due to their packaging or product design in the

case of goods, or to the interior and/or exterior design of a place of business in the case of services. To be protectable as a trademark, the "trade dress" must be non-functional and must have acquired "secondary meaning"; that is, the relevant consuming public must recognize the trade dress as a symbol of the product's source.

One obtains certain common law rights in a trademark simply by starting to use the mark for a commercial purpose. These rights typically give you the right to the exclusive use of your mark for your particular class of goods or services within your existing marketplace, i.e., the geographic locations where you have already used the mark. These common law rights are often signified by the use of a ™ symbol next to the mark.

Many people who desire to expand their geographic territories seek a broader scope of protection and decide to seek federal registration for their trademark. This involves filing, and prosecuting, a trademark application with the USPTO, all of which can be done electronically. The filing fee in 2008 was $325 per class of goods for which the mark is to be registered. If registration is granted, the registrant now has a presumption of national rights to use the trademark, even in markets where the registrant has not yet done business. All of the existing trademark registrations are available in any one of a number of databases that is considered "notice" to the public that a particular trademark is owned by another and is not available for your use. Once a mark is registered, it is appropriate to use the ® symbol with the mark, and failure to do so may undermine one's ability to recover damages for trademark infringement. As with patents, a U.S. trademark application can be the basis for filing applications in other countries, and there is also a separate "international" trademark application process.

The owner of a trademark can keep his rights in the mark as long as he continues to use the mark. Currently trademark registrations must be renewed every 10 years, at which time the owner must show evidence of current use of the mark in order to have it renewed.

As is the case for patents, the owner of a trademark is responsible for policing the use of the mark. If another party is using your trademark or a mark that you feel is confusingly similar to your mark, you may have to sue them for trademark infringement in order to stop their infringing activity. However, the USPTO does police the records of existing trademark registrations and applications and will not let another applicant obtain a registration for a mark that is confusingly similar to an existing registration or application.

7.3.3 Copyrights

Copyright protects works of original authorship from unauthorized copying, distribution, adaptation, performance, or display depending on the form of work involved. Copyright protection begins automatically as soon as an idea is expressed in some tangible form, such as printing it on paper or recording it on film. Copyright only protects the expression of ideas, not the ideas themselves. One will usually see either the word "copyright" or the symbol © (the letter "c" in a circle) on a work, which signifies that the author is claiming a copyright in the work. The use of the word or symbol is not mandatory but is strongly recommended. You do not have to register your work to receive copyright protection, but a registration is necessary to enforce the copyrights and there are additional damages that can be recovered in a lawsuit if the copyrighted work was registered prior to the infringement. Works are registered by submitting to the United States Copyright Office a form (called Form CO) and copies of the work. Some of the application process can be completed online, and the filing fee in 2008 was $35. There is some automatic protection given to copyrighted works outside of the United States by virtue of a number of international treaties.

7.3.4 Trade Secrets

A trade secret is any valuable information that was created by the expenditure of money and time that is kept confidential, and whose economic value derives from its confidential status. The rights of a trade secret are the rights to protect the secret from misappropriation by others, i.e., the independent creation of the same information by a third party would not be a misappropriation. The law of trade secrets exists solely at the state level, in that each state has its own laws concerning the protection of trade secrets. There is no federal law regarding trade secrets. There is no filing or registration process available for trade secrets. The formula for Coca-Cola is an example of a trade secret. The Coca-Cola Company goes to great lengths to keep the formula confidential, and it only discloses it to those who need to know the formula in order to produce the product. If someone independently creates the formula for Coke, however, the law of trade secrets gives no protection to the Coca-Cola Company.

7.4 Federal Rights to Intellectual Property in Government Contracts

The federal government often obtains rights to use intellectual property government contracts. Often, through a research or development contract, it even pays for intellectual property to be created. The general rules for government use of most types of IP are set forth in Part 27 of the Federal Acquisition Regulations, also known as 48 CFR 27. Of course, as with most federal issues, all sorts of exceptions and special cases exist, but here are the general ideas.

Part 27 addresses patents, copyrights, data, software, and "special works." Special works are usually audiovisual materials protected by copyright. Part 27 does not address trademarks. Data is more or less a catch-all term for trade secrets, know-how, and other material not explicitly protected by patent or copyright.

7.4.1 Limited Rights

In general, the government wants to obtain what it calls "limited rights" to IP created at "private" (including non-federal government) expense and what it calls "unlimited rights" to IP created at the expense of the federal government. The federal government generally allows the creator to retain title in its own name, together with all the rights consistent with the grant it has made to the federal government. For the most part, this means that the federal government is entitled to take a royalty-free license to use IP that was developed using its funds. Sometimes, especially with projects that pay for IP to be created, the subject matter is so sensitive (nuclear weapons, etc.) that the federal government takes the title and all rights. In addition to being created at federal expense, the IP must be held by the private party in some protected fashion (trade secret, copyright, or patent).

Up until the first Clinton administration, the system was more likely to allow nonprofit organizations (mainly universities and scientific institutes) and small businesses to retain title. At that time, however, both the Republican Congress and the Democrat administration wanted more private use of government-sponsored IP and felt increased private ownership was more likely to produce such use. The government usually retains what it calls "march-in" rights, however, which would allow it to take the title and assign it to someone else if the original title holder was not using its ownership to make the IP available through manufacturing or licensing. Simply sitting on the title is not acceptable.

Limited rights basically give the federal government the right to use the property for government purposes. To use for government purposes, the government may be able to assign rights to one or more of its contractors (other than the titleholder) in order for the contractor to carry out some government purpose. Note, however, that if the IP obtained includes trade secrets, the government usually assumes the obligation to keep the IP secret from those not officially authorized to use it for permitted purposes for a set period of time.

7.4.2 Unlimited Rights

Unlimited rights basically give the federal government all the rights it would have if it were an owner, except that it cannot grant an exclusive license since the owner also has unlimited rights. But the government could grant a non-exclusive license to one or more parties, or, indeed, to each and every citizen in the United States and elsewhere.

7.4.3 Restricted Rights

Computer software can be a special case. If the software is created at federal government expense, the government usually demands and receives unlimited rights. If the government funds a major development, but one based on previous software created at non-federal government expense, the government usually demands and receives limited rights. If the government simply wants to use software that has been created entirely at non-federal expense (e.g., off-the-shelf commercial software), it demands and receives restricted rights, which are more or less the same rights that a non-government user would obtain. The difference is that the government usually demands and gets unlimited rights to what is calls "form, fit, and function" data, which generally refers to any special instructions for the use of the restricted rights software.

So both buyers and users need to keep unlimited rights, limited rights, and restricted rights in mind when dealing with IP created by a non-federal party.

7.5 Federally Created Intellectual Property

Many federal government employees are in a position to create property that might be eligible for IP protection. Government scientists and engineers develop new technologies, many government workers write software, and almost all government employees author writings. Some government employees even create audiovisual works. Traditionally, works created by someone paid by the federal government were considered placed in the public domain.

The law does allow certain government technologies, writings, and other IP-type property, especially computer software, to be registered with the federal government (patent or copyright) and licensed to one or more private parties. The basic idea is that some of this IP is more apt to be used if a private party can turn it into a product or service while knowing that either no one else (an exclusive licensee) or very few others (a nonexclusive licensee) can use the same technology to compete with the party willing to make the development investment. In addition, to keep necessary skills from leaving the federal government, the law has allowed, indeed required, that revenue from the IP that the government licenses be shared with the individual government employees involved in its creation.

This is a relatively new concept for the federal government and actual policies and procedures are still being worked out. So far, the easiest cases have involved IP protected by one or more patents, where the individual inventors have always had to be identified. Copyright, which allows

registration by a corporate author without even listing individuals, has been somewhat less clear. Trade secrets, which conflict directly with concepts of open government, freedom of information, and the like, have been even harder. It is one thing for the government to agree to keep the secrets of its contractors; it is another thing for it to keep secret contacts and means of doing business, except in traditional areas of national security.

7.6 Violations by Federal Employees

Part 27 discusses the potential misuse of IP by the federal government. The aggrieved party can bring a case in the U.S. Court of Claims, where it can obtain both injunctive relief (stop the misuse) and damages, measured more or less as if the misuse had been by a private party. Typically, however, federal agencies are directed to obtain indemnification obligations from those who are awarded federal contracts in the event that the project results in the infringement of a third party's IP rights.

7.7 State Purchased Intellectual Property

The system governing the purchase of IP by a state government or agency is particular to each state. Typically, a state will have some laws that mirror the Federal Acquisition Regulations (FAR) in terms of government acquisition of property of all types. The purchase itself is done by contract, which will be governed by that particular state's contract law.

7.8 State Created Intellectual Property

The rights of a state government or agency to own or use intellectual property created either by state employees or by contractors at state expense are entirely dependent on that particular state's law. Even in the absence of a specific agreement with the employees or contractors to assign rights in any intellectual property that is created, the agency will typically have "shop rights" in the case of patents, which allow the agency to continue using the invention or technology in question without paying royalties.

In the case of trademarks, a government agency can be the applicant in a trademark registration, which results in the agency owning the registration when it issues. There is no need to have an individual obtain the trademark registration and then assign it to the agency.

7.9 Violations by State Employees

When one or more employees of a state agency are misusing IP, the situation is more complicated. If the aggrieved party is willing to sue the state in state court, the case will be governed by whatever exceptions to sovereign immunity that state has granted. If the state has had a contract with the party and is misinterpreting the contract, most states generally allow disputes over contracts they have entered to be settled in state court. If the state has not entered into a contract, but is allegedly violating the rights granted by a federal patent or copyright law, the situation is different.

By statute, patent and copyright infringement claims must be brought in federal court; state courts do not have jurisdiction to hear original claims for these types of infringements (by contrast, state courts do have jurisdiction to adjudicate trademark infringement claims under the

Lanham Act). However, the 11th Amendment to the U.S. Constitution generally provides the states sovereign immunity from suits in federal courts.

Thus, states and state agencies are generally immune from suits for patent and copyright infringement. Although Congress has enacted provisions in both the Patent Act and the Copyright Act to deny states this immunity, those provisions have not been upheld because of the 11th Amendment and such suits are routinely dismissed. Several bills have been introduced in Congress to meet the requirements imposed on Congress by the Supreme Court for avoiding the 11th Amendment's restrictions, or requiring states to waive 11th Amendment immunity in order to hold their own IP, but none have passed as yet. In any event, it is important to note that state employees may find themselves personally liable for infringements that occur beyond the scope of performing their state-sanctioned job functions.

Nonetheless, most states, and state agencies, do not appear to rely on this "immunity" to violate IP with impunity. It is usually bad politics, if not bad law, to violate the rights of private parties, and often contractual provisions make the state liable under state contract law, without reaching federal IP law. Moreover, the immunity of the state's agencies, officers, and employees does not extend to contractors, so a printing shop asked by the state to make unauthorized copies is fully liable, even though the state might be immune.

7.10 Violations by Local Government Employees

Local governments do not have the same amount of protection from the 11th Amendment since the law treats them in three different ways, depending on the subject matter involved. Sometimes they are considered divisions of state government; sometimes they are considered independent governments; sometimes they are considered a form of collective enterprise much like a corporation. The last distinction is usually made between a local government doing something "municipal" versus doing something "proprietary." For example, providing police protection or levying taxes are usually deemed to be municipal, while operation of city power or water facilities are usually considered proprietary. The fact that either could be provided by a private organization is not dispositive; the fact that it is provided by many or few local governments seems more important.

Thus an alleged violation of an IP provision (outside a contract with the aggrieved party) might be in support of either a proprietary function or a municipal function. If the violation is in support of a proprietary function, the case would look much like that against a private corporation. If the violation is in support of a municipal function, the situation is less clear. Perhaps the deference accorded states would apply. Nonetheless, the local government is held to be a "non-state" contractor when performing this "state" function.

7.11 Fair Use and the Bounds of Protection Generally

In addition to the special conditions surrounding intellectual property and public managers, the general rules still apply. Here are some of the more often cited of those general rules.

One often hears about the "fair use" of intellectual property owned by others. Indeed, because trademarks, trade secrets, trade dress, and right of publicity all stem from unfair trade practice rules, the concept of fairness is inherent in those forms of property. The legislatures and courts have established rules about what is fair regarding use of the intellectual property in question, and how close one can come to the intellectual property itself without being deemed to be using it.

7.11.1 Trade Display Properties

For the trade display properties (trademark, trade dress, and right of publicity), the general standard is "likelihood of confusion." This applies both to your use of the trade display property and your use of close substitutes. Your use must either be authorized by the owner or make it clear that you are referring to the goods, services, establishment, or persona of the owner, not you. For instance, you can use the trademark IBM when referring to IBM computers, even when comparing them to yours, as long as you make it clear that your computers did not come from IBM or that you are not otherwise associated with IBM.

The same standard applies to your use of close substitutes. In a court case, the judge or jury will try to determine how likely your use is to confuse the relevant audience. If your use pertains to an unrelated good or service (e.g., Apple computers versus Apple records) it will probably be deemed lawful, unless the mark is so "famous" that another person cannot use it even with unrelated goods or services because it would "dilute" the power of the famous mark. This dilution standard has been used to prevent McBeds from becoming a hotel chain, for instance, since McDonald's was such a famous mark.

This same principle has allowed the owners of a long and widely-used trademark to prevent the use of that mark as a domain name by others, if the registration was made in bad faith. Congress amended the Lanham Act with the Anti-Cybersquatting Protection Act, which prevents the bad faith registration of a domain name containing someone else's personal name or trademark. The individual who registered mtv.com, for instance, had to give it up to MTV, the TV channel. The adult site that registered candyland.com had to give it up to the toy company that has been manufacturing the game Candyland for decades. On the other hand, if apple.com were in dispute between Apple Computer Inc. and Apple Records Inc., the outcome would likely favor the first to register the domain name, since either company has legitimate rights to the term "Apple."

Since there are few dominant domain names for commercial enterprises (those that end with ".com," ".biz," ".info," for example), the competition is intense for memorable names. We suspect, however, that technology will provide a major lessening of this problem. Sophisticated search engines, such as Google, allow users to find domain names registered to a particular company, regardless of how memorable the domain name is itself, and even if the domain name looks nothing like the company's name or principal trademark.

Because government agencies are usually assigned ".gov" as the last part of their domain names (or ".mil" for military agencies, or ".edu" for educational institutions, or ".org" for nonprofit organizations and groups), they are usually not in conflict with commercial counterparts, although they may be in conflict with each other. However, the anti-cybersquatting rules may still apply—for example, if someone registers "harvard.com," "yale.com," "princeton.com," etc. with a view to offering a prestige address that has nothing to do with the famous institutions at "harvard.edu," "yale.edu," and "princeton.edu." If the domain harvard.com is used for a business in Harvard, Idaho, it may be acceptable; if it is used to trade on the prestige of Harvard University, it is likely to be deemed a bad faith registration and thus subject to seizure by Harvard University under the Anti-Cybersquatting Protection Act.

Rights of publicity entail the protection of a person's name, likeness, voice, mannerisms, etc. from commercial use without the person's consent. These rights are protected by varying state statutes and state common law. Some states, like Indiana and California, have strong publicity laws that prohibit *per se* most commercial uses of a person's right of publicity, even for years after the person's death. On the other hand, even these strong statutes provide exemptions for news reporting and other similar situations, so unless the public manager is trying to use a "name, voice, or likeness" to advertise something, the use may be an exception to the rule.

7.11.2 Trade Secrets

Trade secret is an easier case in many ways. First of all, the protection generally applies only to the exact information kept secret. The independent development of the same or similar is permitted, as long as the information did not stem from unlawful access to the secret itself, or from an unacceptable use of lawful access to the secret, such as by a breach of a confidential disclosure agreement.

Because trade secrets may be licensed or disclosed to authorized parties under a confidentiality agreement, but are otherwise unknown to the world (or they lose their "secret" status), the use provisions of these agreements generally set forth what can be done with the secret by those who know it lawfully. Even absent an agreement, the general rule is that neither the former employee of a company with a trade secret nor his or her new employer can use the secret, even if the company did not know the information was secret when the former employee passed it on.

Once secret status is lost for legitimate reasons (such as the trade secret owner's failure to treat its own information in confidence), the entire world is free to use the information.

7.11.3 Patents

Patents are the opposite extreme of trade secrets because they are disclosed to the public in detail through the granted patent document. The detailed description of the invention and how to practice it appears on the patent itself, which is freely available at the U.S. Patent and Trademark Office (including its free online database) and in U.S. Depository Libraries around the country.

The basic rule is that in order to practice a patented invention, permission must be obtained from the patent owner. Note that, under the "first sale" doctrine, once a patented article has been lawfully purchased, the patent rights associated with that product have been exhausted and the product can be freely used.

There is a "fair use" concept in patent law; however, it is very limited. Someone may "practice the patent" in order to study the invention it claims. This does not mean to "use the patent for research purposes." Many universities and other research institutions have found, to their dismay, that the fact they are using the patented device, compound or method to do research to develop new devices, compounds or methods still need to get the permission of the patent holder. Only the study of the patented invention itself is covered; all other uses require permission.

Also, because the specific details of the invention are publicly disclosed, courts have been reluctant to allow outsiders to use very close substitutes. Under the "doctrine of equivalents," outsiders who try to accomplish the same purpose using the same means, but with insignificant differences in various steps along the way will be required to obtain permission from the patent holder.

Because patents vary widely in how broad the claims are by the time they are granted, the zone within which an alternative will be deemed insufficiently different varies sharply by patent. In fact, in cases where the invention has high commercial value, the cases are frequently litigated to the tune of well more than $5,000,000 spent by each side in fees to attorneys and expert witnesses and appeals all the way to the Supreme Court.

7.11.4 Copyrights

The copyright owner has the exclusive right to reproduce, distribute, prepare derivate works, publicly display and publicly perform the copyrighted work, and engaging in any of these activities without the permission of the copyright owner is an infringement (regardless of your intent). Similarly, engaging in these activities with a work that is "substantially similar" to the copyrighted

work, assuming you had access to the original work, is an infringement. One need not copy the entire work to be judged an infringer; even the copying of a few seconds of a sound recording has been held to constitute an infringement.

All of these rights entail the prohibition against some type of "copying" the copyrighted work; accordingly, the independent creation of even an identical work is not an infringement if you did not have access to the original. Indeed, the creator of the independent work would himself own copyrights to that work. For example, in software development, many companies use a "clean room" procedure, where programmers who had never seen another company's source code, object code, or the program in action were asked to produce a program with similar functions. Even if the new code turned out to be identical to the other one, it should nonetheless be considered a separate act of creation, not based on copying.

The legal boundaries for making use of the copyrighted works of others without their permission present some of the most complex and fact-sensitive inquiries in copyright law.

The copyright statute itself sets out several limitations on the exclusive rights of copyright owners, including fair use, as well as other specific limitations such as permitted copying, distribution, performance, and displays of works for face-to-face classroom teaching, and the ability to adapt works to be accessible for the handicapped, by certain non-profit institutions.

With regard to fair use specifically, the statute (17 USC 107) says that copying a work "for purposes such as criticism, comment, news reporting, teaching, scholarship, or research, is not an infringement." Each use, however, will be examined to see if it qualifies as fair use by applying four factors which include:

1. The purpose of the use such as commercial or nonprofit, educational, etc.;
2. The nature of copyrighted work, creative versus factual works;
3. The amount or percentage of the work copied; and
4. The damage to the market value of the work, if any.

Perhaps the most important of these factors is the purpose of the use of the copyrighted work. Courts usually favor the criticism, comment, reporting, etc. purposes listed above. Also, transformative and creative uses of the copyrighted work are favored as opposed to pure literal copying.

Other doctrines limit the ability of a copyright owner to claim copyright protection to aspects of the copyrighted work. For example, it is well-settled that "the law" is not subject to copyright protection. Thus judicial opinions and enacted federal, state and local statutes, ordinances, and regulations are not protected by copyright, even if the wording was taken from outside, private sources, such as model codes, that are otherwise copyright protected.

Another limitation on the rights of copyright owners is the *"scenes a faire"* doctrine, which stems from the use of traditional situations and traditional roles in many stage plays, but has obvious applications to novels and even software programs. If one creative work uses standard elements or themes (the poor but beautiful girl, the rich but evil man, etc.), it can contain a copyright in the specific way it used them, but not in the standard elements or themes themselves. On the other hand, if the element is itself unique—a character such as Bugs Bunny, Mickey Mouse, or Kermit the Frog—any use of that element is very likely to be considered an infringement. Similarly, the "merger doctrine" holds that one cannot claim copyright protection to an expression of an idea if there only very limited ways to express that idea.

An additional complication occurs when the copyrighted work combines both new content and content that has entered the public domain long before; for example, new editions of the Bible and other such religious works as well as the classic novels come immediately to mind. The

publisher can still hold copyright in the "new original elements" of his publication and prevent "pure copying" of these elements, such as headings, footnotes, explanatory material, pictures, and the like, even though the underlying material is in the public domain and may be freely copied.

An additional limitation of the rights of copyright owners concerns computer software. An owner of lawfully acquired software is allowed, by law, to make archival or backup copies, and to make the copy that goes from the hard drive into the random access memory (RAM) of the computer in order to run the program. Computer program owners are even allowed to create derivative works to the extent needed to modify the program to make it run on a single computer. However, note that the publishers of computer software usually try to cast the transaction as a mere license to use the software, as opposed to a sale, and thus they are able to impose more restrictions than the "sale" of a "copy" would allow.

Like patent law, copyright law recognizes a first sale doctrine for most types of copyrighted works. Those who lawfully acquire a copy of a copyrighted work (such as purchasing a book at a book store) are allowed to sell, donate, or lend that copy to others, or otherwise dispose of it in any way. (Note that even a lawfully acquired copy of copyrighted software cannot be loaned for profit; thus there are no "Blockbuster Software" stores.)

Of course, one cannot make a copy of the work or publicly display or perform it, although it can be displayed or performed privately. Whether a performance is "public" or "private" is fact-sensitive. The general rule is that the performance or a display of a work in a setting other than one's normal circle of family and friends is considered public. Also, the performance or display does not have to be perceived by its audience at the same time or in the same place in order to be considered "public." Thus, the publication of a work on a Web site is considered to be "public" even though the website may not be viewed by more than one person at a time or by people gathered in one place.

Finally, it is important to note that copyright lasts for a very long time. The current state of the law in the United States (and by treaty throughout most of the world) is that copyrights last for the life of the author (or last living author for joint works) plus 70 years if created by individuals, and 95 years from first publication or 120 years from first creation, whichever is shorter, if the work is a work made for hire. This long duration makes the ability to obtain permission to use older works problematic, given that, in many instances, the copyright owner may be very difficult to track down. Congress is contemplating enacting "Orphan Works" legislation to make it easier for others to use these older copyrighted works.

7.11.5 Web Sites and Copyright

Government agencies usually use Web sites to distribute information, allow clients to provide feedback, and for other purposes. Like any other written and pictorial works, original works of authorship found on Web sites are protected by copyright. Similarly, you should be careful in incorporating into your Web site materials obtained from other sources, such as text, music, videos, or pictures. Such uses can infringe the copyrights of others.

Some Web sites are designed to be interactive so that users can post material to the Web site. In such instances, it may be difficult to police whether the submitted material infringes the rights of others. Yet the Web site operator will ordinarily be liable for the infringements on its Web site, even if the infringing material was placed there by a user.

Fortunately, Congress has provided a safe harbor for Web site operators for claims of such infringements in the Digital Millennium Copyright Act (DMCA) (17 USC 512). Generally, a Web site operator will be immune from claims for damages for infringements on the site if the

operator acts promptly to remove or disable access to the infringing material once it becomes aware that the material is there.

In order to qualify for this safe harbor, there are several procedural requirements. The Web site operator must designate an agent to receive notices of infringement. The information about its designated agent must appear on its Web site (for example, in the Web site's terms of use) and must be submitted to the Copyright Office. The Web site operator must adopt and reasonably implement a policy for its users that provides for termination of users' access to the site who are repeat infringers. Also, the system must accommodate and not interfere with "standard technical measures" used by copyright owners to identify and/or protect copyrighted works. In other words, the Web site operator's transmission or storage of copyrighted material must not interfere with any technical measure implemented by copyright owners to identify or protect their works.

The DMCA has substantive requirements as well. Assuming the above procedural requirements are met, the Web site operator may avoid liability for monetary damages due to its storage and display of infringing material on its Web site if the operator:

1. Does not have actual knowledge that the material is infringing, or is not aware of facts or circumstances from which the infringing activity is apparent; and
2. Does not receive a direct financial benefit attributable to the infringing activity, if the website operator has the right and ability to control such activity; and
3. Upon notice of a claimed infringement, responds expeditiously to remove or disable access to the infringing material.

If the Web site operator removes or disable access to content in response to an infringement notice, it should make reasonable attempts to contact the person who posted the affected content. If the poster believes that the material is not infringing, he may provide the Web site operator with a counter notification by a written communication. If the Web site operator receives such a communication, it can restore the accused material to the Web site and still retain its safe harbor status.

Note that in some circumstances, the amount of infringing material on a Web site may be so plentiful and commonplace that the Web site operator could be deemed to have "constructive knowledge" of the infringements, even if it has not received a formal notice under the provisions of the DMCA. The failure to address the infringements in the face of such constructive knowledge can move the Web site operator out of the safe harbor and face to face with the prospect of full liability for those infringements. At the time of this writing, YouTube is embroiled in lawsuit brought by Viacom and other content owners over this precise issue.

Thus, the prudent course is to remove or disable access to material that is posted on your website that clearly belongs to another party as soon as you become aware of it.

7.12 Further Reading

7.12.1 Books

One of the books both authors have found particularly helpful as a general, almost layperson overview is *Intellectual Property: Patents, Trademarks, and Copyrights—In a Nutshell* by Arthur R. Miller and Michael H. Davis (St. Paul, MN: West Publishing Co, 1983). A new paperback addition was made available in 2007. The West Nutshell series is uneven, but when it is good, it is very good, and we both really liked this view of intellectual property. It may be just a bit detailed for

a general audience, but a public manager who deals with intellectual property on a frequent basis will appreciate the broad, non-technical coverage.

7.12.2 Internet Resources

What follows are several useful Internet sites. Each of these sites maintains updated links to additional useful sites.

The U.S. Patent and Trademark Office *http://www.uspto.gov*

This site is the best single source for patent and trademark information. The site offers searching of databases for both patents and trademarks as well as filing forms, fee information, statutes and rules, and contact information. Start here before going to other sites.

The U.S. Copyright Office *http://www.copyright.gov*

Again, like the USPTO site above, this site should be the starting point for copyright questions. There is a variety of general copyright information, filing forms, statutes, and links to additional sites.

7.13 Summary Chart

The following chart summarizes many of the attributes of the four main types of IP we have been discussing.

Attribute	*Patent*	*Copyright*	*Trademark*	*Trade Secret*
Origin	U.S. Const.	U.S. Const.	Common law of unfair trade	Common law of unfair trade
Protects	Inventions — process, machine, composition of matter, or article of manufacture that are novel, useful, and non-obvious	Original expression in writing, music, arts	Symbols (e.g., words, logos, slogans) used to designate the source of goods or services	Technical secrets (like Coke recipe) and business secrets (like customer list) that are confidential and economically valuable
Key federal statute	35 USC 1001	17 USC 101	15 USC 1051	None
Govt. contract treatment regulations	48 CFR 27	48 CFR 27	None	48 CFR 27
Federal registration	Required	Optional, but gives additional remedies	Optional, but gives additional rights	None
State registration	None	None	Optional	None

Continued

Attribute	*Patent*	*Copyright*	*Trademark*	*Trade Secret*
Term	20 years from filing	Life of author plus 70 years if person; 95 from publication or 120 from creation if corporation	As long as in use	As long as kept secret
Initial Ownership	Inventor; companies only gain rights via assignment	Individual Authors, but Employers can be considered authors for works made for hire	The first to use the mark in commerce with respect to particular goods or services	The developer of the secret who is the beneficiary of its value – usually the company (as opposed to the individual)
Power against independent creator	Can exclude others from practicing the patented invention, even if developed independently or without knowledge of the patent	None. The protection is only against copying by others	Depends on use – a second user can be stopped if it is using the same or confusingly mark with the same or related goods and services	None unless the person stole your secret or got it from someone known to have stolen it
State Statute	None	None	State Trademark Act	State Trade Secrets Act (may be Uniform Trade Secrets Act)
Useful Web sites	See text; the same site tends to discuss many forms of IP			
Infringement standard	Use, make, sell, offer to sell, or import something covered by, or equivalent to, the elements of one or more claims in the patent	Copying and substantial similarity	Likelihood of confusion	Misappropriation

Chapter 8

When Public Information Systems Become a Crime Scene: An Overview of Forensic Considerations in Incident Response

Philip C. Christian

CONTENTS

8.1 Introduction

Pete was a new systems administrator tasked with monitoring a public agency database server on the night shift. The database server contained sensitive information on several million residents served by the agency. He sat transfixed, staring at the information on his monitor that clearly showed someone had breached the root of the server. Worse, he found that a section of the database was being used to host files that appeared to be child pornography.

Pete's response to this breach is fraught with potential for errors that carry grave consequences not only for Pete, but for the public agency. Pete knew that he could disable the attacker's access to the root and clean up the database by removing the attacker's files. But would that be the proper action to take? There are a number of issues that Pete should consider before taking action:

- In addition to storing child pornography on a government server, was the sensitive information stored in the database compromised in the attack? If so, to what extent? By whom? It may be important to identify the attacker to minimize the damage from any data breach. But if Pete cuts off access, it may be impossible to trace the attacker.
- How did the attacker gain access to the root? Is it an inside job? What vulnerabilities exist on the database server that might allow such access by an outsider? What should be done to prevent such access in the future? Pete's actions may prevent the agency from identifying and eliminating existing vulnerabilities.
- The existence of child pornography on the server means that the incident must be reported to law enforcement. Failure to report can subject Pete and his supervisors to felony charges. Assuming Pete knows this and intends to report the crime, how can he ensure his reactions to the attack do not destroy evidence?
- Were other agency systems compromised as a result of the attacker's root access on the database server? If so, Pete's actions might destroy the ability to identify additional compromised servers.

Should any one systems administrator be tasked with the response to an attack that carries such dire consequences if the wrong choices are made? The natural instinct of an administrator is to cut off the attacker's access and protect the system. How do you corral that instinct and guarantee that choices are not made in haste without due consideration of the consequences? How do you preserve the evidence that might allow prosecution of the individual or individuals involved in the attack? How do you ensure that the evidence is collected in a manner that will be admissible in a court of law?

Fortunately, the answer to all of these questions is fairly straightforward: You must plan for the incident response before the incident occurrence. Administrators like Pete must have an action plan available that will enable a rapid and effective response to any type of incident that might occur. Such pre-incident planning is important for all entities but more so for public agencies and other governmental entities. Private companies often do not report attacks to law enforcement or the public because to do so can damage their credibility in the marketplace. If a private company is the only victim of the attack, they may respond in any way they choose. Politics and issues of transparency make such choices more difficult for a public entity even if confidential public information is not compromised in the incident. As a result, the response ultimately chosen will be subject to much greater scrutiny. Corporate information professionals stress continuity of business and company reputation in their response to incidents. The

approach taken by information professionals in the public sector will likewise tend to emphasize continuity and agency reputation.

Law enforcement involvement tends to have a negative impact on these priorities. Law enforcement prefers to have the systems shut down for an extended period of time for evidence gathering, and first responders from law enforcement will likely not be their experts, so the initial response will be much slower if law enforcement is the first response. If your organization is properly prepared and trained, you can initiate the first response and secure evidence while awaiting the law enforcement response. In the case of corporate systems, this is advisable in case your response uncovers a crime that must be reported. In the case of public information systems, it is critical because the result of an inability to prosecute a crime due to faulty response can lead to unacceptable and potentially devastating political or public backlash.

The purpose of this chapter is to discuss forensic considerations in incident response. It is important to understand that the overall incident response framework must integrate the forensic response to make it effective and set the stage for forensic activities. The forensic response cannot be an afterthought. Therefore, some discussion of security policy and the overall incident response framework is helpful prior to discussion of forensic considerations.

8.2 Security Policy

The development of effective security policies is a critical step in the incident response framework. The primary goal of security policies is to prevent the occurrence of incidents, where possible, and to minimize their impact and scope once they do occur. But security policies also have an impact on what types of forensic activities can be undertaken once the incident occurs and the admissibility of evidence gathered during the incident investigation.*

If an organization fails to create written security policies and accompanying procedures, response activities will be governed by existing Constitutional, federal, and state law, which may restrict activities in the following ways [Mandia et al., 2003; Department of Homeland Security, 2008; Middleton, 2001; Britz, 2003; Schwerha, 2004]:

- The Fourth Amendment provides protection from unreasonable search and seizure. The Fourth Amendment applies to people, not places (*Katz vs. United States*), so even though an employer owns the computer an employee uses, that employee may have an expectation of privacy. A search warrant may be required to search a computer the employer owns.
- The Wiretap Act (18 U.S.C. 2510-22) may prevent full-content monitoring of traffic on an organization's own network or access to employees' unread e-mail.
- The Pen Registers and Trap and Trace Devices Statute (18 U.S.C. 3121-27) may prevent an organization from being able to identify the source of an unauthorized incoming connection on the organization's network.
- The Stored Wire and Electronic Communication Act (18 U.S.C. 2701-12) may prevent an employer from accessing an employee's opened e-mail.

* I am not providing legal advice. To the extent this discussion focuses on legal issues, it is based on my experience with the law in practice. It is imperative that legal counsel is available during the formulation of policies. However, any discussion of a forensic response to a computer incident must include acknowledgement of the legal issues likely to be encountered.

Violations of these statutes may do more damage than inadmissibility of evidence; they may constitute a federal felony punishable by fine and imprisonment. With appropriate policies in place, an organization may be able to bypass these restrictions and push the initial stages of the investigation forward while awaiting a response from law enforcement. The organization may be able to perform steps that ordinarily require a search warrant, court order, or subpoena when performed by law enforcement. This can be accomplished by having users of the network consent to search, wiretap, trap and trace, and other activities by agreeing to organizational written policies each time they log on to the system. Written policies will spell out the actions the organization may take with respect to individual computers or servers on the network and with respect to traffic over the network. By incorporating a log-on banner that requires acknowledgement of these procedures at logon, the organization obtains consent each time a user, or attacker, logs onto the network. For example, our log-on banner at the Florida Department of Revenue reads as follows:

> WARNING! THE DOR NETWORK IS FOR AUTHORIZED USERS ONLY
>
> Unauthorized access to, use of, or modification of this computer system or of the data contained in or accessed via this computer system is a violation of DOR policy and Florida law. Unauthorized use of or access to Federal tax information available via this system is a violation of Federal Law punishable by Criminal and Civil penalties pursuant to Title 26, United States Code, Sections 7213(a), 7213A, and 7431.
>
> ALL USAGE OF THIS SYSTEM IS SUBJECT TO MONITORING
>
> This system and equipment used to access this system are subject to monitoring, which may result in the acquisition, recording, and analysis of all data being communicated, transmitted, processed, or stored in this system by a user. If monitoring reveals evidence of possible violation of DOR policy or of criminal activity, such evidence may be provided to appropriate internal or external investigatory or law enforcement personnel [Florida Department of Revenue, 2005].

The only options given the user are to agree or shutdown.

A boilerplate log-on banner that could be modified for an organization's specific use is available from Carnegie Mellon University's Computer Emergency Response Team (CERT) at http://www.cert.org/advisories/CA-1992-19.html.

The effect of the written policies and log-on screens is to remove the reasonable expectation of privacy on the part of system users. If there is no reasonable expectation of privacy, there is no search and no Fourth Amendment restriction [Department of Homeland Security, 2008].

Organizational policies will cover a wide variety of activities, and it may be beneficial to create separate policies for different types of system use. For example, an Acceptable Use Policy will govern the behavior of all users on the system. An Internet Usage Policy governs use of the Internet from the organization's network. Remote Access Policies govern who can access the system remotely and how such access will be arranged and secured. These policies will fully detail the users' rights and responsibilities while utilizing the system and will make it clear that monitoring, e-mail access, and access to files on individual computers should be anticipated and expected. It is important that all employees are officially oriented to these policies, beginning with new employee orientation and continuing with updates as the policies change. Each orientation for employees should involve employee sign-off on the policies. The log-on banner then serves to remind the employees of their obligations and the rights of their employer each time they log on.

The development of sound policies, employee orientation, and the appropriate use of log-on banners is a crucial step toward avoiding legal pitfalls, but an attorney intimately familiar with the legal environment related to computer evidence will be an essential part of both policy development and incident response teams.

8.3 The Incident Response Plan

Much as the users have policies in place that let them know what is expected of them, those who manage the system will have policies in place to guide them when an incident occurs. In the example from the beginning of this chapter, Pete should know the policy of the agency regarding network intrusions and system compromise. The policy may broadly state that Pete should minimize damage to the system and attempt to discover who is behind the attack without compromising evidence that might be needed in litigation or prosecution. Without detailed procedures for implementation of the policy, the policy itself may be of little benefit to Pete. Detailed procedures will make up the incident response plan that Pete will initiate. More likely than not, Pete's first procedure will be to call the Computer Security Incident Response Team (CSIRT).

For a CSIRT to be effective, it must be established well before an incident occurs. The team will need time to train and properly prepare for responses to security incidents. The CSIRT might consist of only internal employees, only external consultants, or a combination of internal and external members. The key to this decision is whether there is sufficient expertise within the organization to staff the team internally. Likewise, the team's mission can vary from responding to only the most serious threats to responding to all security issues regardless of severity. Care must be taken in restricting the CSIRT mission, however, because it can sometimes be difficult to determine whether an intrusion or other incident actually occurred. The CSIRT should be staffed with specialists who are best prepared to make that call and should ideally be the first contact once an administrator believes an incident has occurred [Mandia et al., 2003; Nolan et al. (1) 2005].

It is important that the CSIRT include expertise in forensic response to an incident. Federal agencies are now required, under the Federal Information Security Management Act (FISMA) of 2002, to establish incident response capabilities pursuant to guidelines established by the National Institute of Standards and Technology (NIST), which produced Special Publication 800-61 (rev 2008), Computer Security Incident Handling Guide, in response to this mandate Scarfone, Grance, and Masone, 2008. The guide recommends that all CSIRTs include forensic response capabilities, and it further lays out the groundwork for this inclusion in Special Publication 800-86 (2006), Guide to Integrating Forensic Techniques into Incident Response.

State agencies must look to specific state statutes for their security requirements. For example, in Florida it is Chapter 282, Florida Statutes, The Management and Security of Data and Information Technology Resources in State Government. This statute gives rule authority to the Agency for Enterprise Information Technology and makes it responsible, "in consultation with each agency head, for assessing and recommending minimum operating procedures for ensuring an adequate level of security for all data and information technology resources . . ." (Sec. 282.318(2)(a), F.S.). State statutes and rules may not be as specific as federal rules. As a result, it should not be a surprise that many of those responsible for state agency security will look to the NIST rules for detailed guidance.

The CSIRT can help train the administrators on what should be done if an incident is suspected and assist with making appropriate hardware and software available for use in case of an incident. The CSIRT can also be proactive in assisting administrators in securing the

system from attacks before they occur and in putting a network monitoring platform in place [Kent, 2006].

The CSIRT should provide administrators and users with one phone number, usually a help desk manned 24/7, that can be called when an incident is suspected. The technician answering the phone may be able to confirm whether or not an incident is underway. If so, the technician will know to escalate the incident and will know who, within the CSIRT, to contact based on the type of incident reported. Because users may be calling regarding unusual behavior on the computer they are using but may not understand that an incident is underway or that their computer has been compromised, it is wise to staff the help desk with technicians who thoroughly understand the behavior different types of attacks might manifest on a user system [Mandia et al., 2003].

Once an administrator sees that an incident is underway, it is a natural inclination to attempt to trace the perpetrator, secure the network, and shut down the affected hardware as soon as practicable. There are potential dangers no matter what the administrator decides to do. This is why it is critical to call the CSIRT before taking action. The initial response must be unhurried and deliberate. One wrong action and critical evidence might be lost.

8.4 The Forensic Plan

8.4.1 Forensic Policies and Procedures

Just as policies and procedures must be developed to govern acceptable use of the organization's information systems, policies and procedures are required to govern use of forensic tools as well. Forensic tools will likely record sensitive information, and procedures will be required to safeguard that information. Policies should spell out the conditions under which forensic tools should be used and when they should not be used. The NIST recommends in Special Publication 800-86 [Kent et al., 2006] that forensic considerations and forensic tools be integrated into the information system life cycle. This will allow more efficient handling of incidents when they occur. Many functions that are considered integral to normal system maintenance can be tailored to serve a forensic purpose as well. Enabling auditing on workstations, servers, network devices, and mission-critical applications can provide evidence of unauthorized access attempts. Perhaps most importantly, the maintenance of a database of hashes for the files of commonly used operating systems and deployed applications can greatly reduce the number of files that must be reviewed when an incident occurs and can help to identify files that have been modified or replaced during an attack.* This proactive procedure alone can save hundreds of hours of investigative time. Comparing a hashed snapshot of the files before and after the attack will readily yield those files that must be most closely scrutinized. Hashes of known hacker tools, viruses, and other malware can also be used to proactively scan systems and may yield early warning of an attack in progress.

It may be impossible to create procedures for every possible incident that could be encountered, but general methodologies can be developed to guide investigation using forensic techniques. The ultimate goal of these methodologies is to support the admissibility of evidence in court. Policies should clearly cover gathering, handling, storing evidence properly, and the preservation of the integrity of the tools used to collect evidence.

* File hashes are created using a hash algorithm, which is a mathematical function that takes a string, in this case an entire file, and converts it to a numeric code. The algorithm will use 128-bit or a higher encryption, which makes the likelihood of any two files having the same hash value extremely remote.

8.4.2 Evidence Collection

8.4.2.1 Volatile Data

There are many types of volatile data present on a live system that might represent important evidence to the investigator. Network configurations can be dynamic, and analysts should always make sure they are working with the current configuration. The current time and date are critical when later analysis of the data is undertaken. Network connections, network traffic, open files, running processes, and log-in sessions show who is on the system and what files or other resources are being accessed.

During certain types of incidents, such as a network intrusion, collection of evidence from a live system might be a high priority. Forensic technicians like to "pull the plug" as soon as possible to prevent changes to the target system, but pulling the plug or otherwise shutting down the system can immediately eliminate evidence and data required to determine who is accessing the system, what is being accessed, and how far the breach has spread. Thus, it is sometimes necessary to allow some degradation of evidence in order to obtain other appropriate and useful evidence. Locard's Exchange Principle holds that with contact between two items, there will always be an exchange [Thornton, 1997]. The perpetrator has left evidence as a result of his or her contact with the crime scene. This concept holds true for a digital crime scene just as it does for a physical crime scene. Likewise, the administrator's or investigator's contact with the crime scene will also leave remnants behind that might contaminate the evidence left by the perpetrator. An administrator "clicking around" with the mouse on a compromised system will change the date and time stamps on files. Opening a modified file creates reasonable doubt as to who actually modified the file and when. Therefore, it becomes critical for the administrator or investigator to know exactly how his or her interaction with the scene has altered it. Changes or modifications to the data collected as evidence that occurs between the commission of the crime and evidence analysis is referred to by Chisum and Turvey [2000] as "Evidence Dynamics." Such changes or modifications must be accounted for during the analysis phase of the forensic activities in order to assure the integrity of the evidence. In order to make this possible, the administrator or investigator must thoroughly document every action taken with respect to the compromised system and must understand the impact tools used during the response have on the system. Every command executed on the compromised system should be documented.

The analyst must first determine if the evidence must be collected and maintained in a manner that will support its future use in a court of law or in an internal disciplinary proceeding. This decision will usually be made by upper management with input from legal counsel. If the answer is affirmative, a clearly defined chain of custody must begin with the initial steps taken by the analyst in the response and continue throughout the collection process by maintenance of a log that details every person who touches or works with the evidentiary matter and documenting the actions they perform. This logging process begins with the initial response and continues until the evidence is presented at trial or otherwise used internally. According to the NIST recommendations [Kent et al., 2006], if the analyst has no clear cut answer on whether the evidence must be preserved, then it generally should be preserved.

The software and hardware tools used in the response should be thoroughly tested before the need to use them in an incident response arises. Any tool used in the response may make changes to data in the system. Undocumented changes to the system can raise reasonable doubts as to the integrity of the evidence obtained. Because the tools to be used are known ahead of time and can be tested on live systems, there is no reason for an analyst to ever enter an evidentiary proceeding and not be able to describe the impact his or her use of tools had on the compromised system or the

evidence obtained therefrom. In a perfect world, the analyst would be able to concentrate solely on ejecting the intruder and protecting the evidence, but in the real world, it may be extremely important to monitor the intruder's actions for a period of time. This monitoring activity will not compromise the integrity of the evidence if planned and executed properly. Ultimately, the organization's policies and procedures and the response team's assessment of risk will determine when the incident will be contained and the intruder locked out.

The response toolbox should include programs that will have minimal impact on the system under investigation and have a high degree of reliability, which generally means executables that contain all of the library functions they reference so that separate dynamic link library (DLL) files are not needed. While the impact of tools can be explained in such a way as to protect the integrity of the evidence, it still must be understood that tool use can overwrite or otherwise destroy needed evidence. Therefore, it is desirable to utilize tools that have a minimum footprint on the system. In general, this means using only command line tools. For example, Windows-based software applications run on the compromised system are too resource intensive for use in gathering volatile data from a live system, unless they can be run from another computer and remotely access the volatile data on a compromised system in a forensically sound fashion. Use of some of the more expensive forensic packages, such as Encase Enterprise, will allow this. But in most cases the command line tools will be the first employed. They can be used to verify that a compromise has occurred and to gather preliminary data that helps to establish the boundaries of the breach while leaving little or no evidence of their use on the compromised system and without overwriting any evidentiary data that exists.

Command line tools useful in a forensic response are generally available free of charge. Some are built-in DOS, UNIX, or LINUX commands, while others are provided in vendor resource kits or are available for download from trusted security vendors online. These tools will be run from a CD, floppy disk, USB thumb drive, or over the wire from another computer using remote access rather than from the compromised system. System files on the compromised system may have been replaced during the incident to booby trap the system and destroy evidence when used. The analyst should have verified safe copies of all system files needed to run the tools on the toolbox media. The tools should be run in such a way as to route the output to a file maintained on a floppy disk, USB drive, or a drive resident on another system. The tools should not be allowed to write to a hard drive or volume that resides on the system under investigation. It may be useful to write a script to execute the tools, route the output to the appropriate storage device, and provide a trail of the commands executed and command line switches utilized.

8.4.2.2 Tool Testing and System Baselines

The tools used in an incident response are tested on a live system before ever being used in a live response scenario. Testing is relatively simple. A free program like FileMon, or its GUI replacement Process Monitor, can be downloaded from the Microsoft Sysinternals Web site. The program monitors and displays system activity on the live system in real time. Activity can be recorded for later review. The system can be monitored while running the tools from the incident response toolbox to gauge the impact of the tools on the live system, e.g., to determine what files or processes are impacted by running the tool.

Baseline hashes can also be useful for before and after comparison, not only of the impact of tool use, but when an incident occurs. It is critical to create baselines of live systems before incidents occur. The hash value serves as a fingerprint identifying the file and its contents. This baseline is very useful in identifying changes in files or file replacements that may have occurred

as a result of the incident. When an incident occurs, hashes of the files on the compromised system are recreated and compared to the baseline hashes. This helps to greatly reduce the number of files that must be analyzed during the response and reduces the amount of time required to mount an effective response. Hash signatures for common viruses, rootkits, and similar malware are also maintained and available from NIST that may help to quickly identify the tools used in the attack.

8.4.2.3 Nonvolatile Data Collection

Once the volatile data collection has been completed and the incident has been contained, the compromised system will be shut down to prepare for forensic imaging unless the server is mission critical and contains large volumes of data. Policies and procedures will dictate when an image is required. Not all incidents will require a bitstream image of the targeted hard drives, but if an organization is unsure of how extensive the unauthorized access to the system was, an image can be very useful because of the extended analysis capabilities that can be brought to bear. If an image is not required, nonvolatile data such as logs, user groups, passwords, and data stored in files can be collected from the file system as needed without imaging. The toolkit should include command-line tools for string searches and carving tools for different types of files to enable the analyst to acquire the files needed in an efficient manner.

Policies and procedures should be created to guide the process of imaging hard drives from compromised systems. Policies should provide for the use of approved hardware and software for creating the image, proper training of personnel tasked with creating the image, and for maintenance of the chain of custody with respect to imaged drives. An image that is properly created and properly maintained becomes "best evidence" at trial. Under Rule 1001(3) of the Federal Rules of Criminal Procedure, if data is stored in a computer, then any printout or readout of the data that is shown to reflect the data accurately is an "original." Under Rule 1001(4), a duplicate is a counterpart produced from the original or from the same source as the original produced by techniques that accurately reproduce the original. Under Rule 1003, a duplicate is admissible to the same extent as an original unless a question is raised to its authenticity. Authentication occurs through the testimony of a witness who has knowledge of the process or system used to seize the evidence, secure it, and preserve it. Appropriate policies and procedures help ensure that authenticity issues can be successfully countered through the testimony of a well-trained, skilled analyst who performed the analysis using tools that have been thoroughly tested for integrity [Mason, 2007].

8.4.3 Examination and Analysis of Evidence

Organizations need to be aware that the data gathered during the incident, particularly if hard drives are imaged, will be more than voluminous. In addition to files and folders maintained within the file structure, which are fairly easy to review, the majority of the data that might be of use may lie in file slack, unallocated space on the hard drive, the page file, the hibernation file, or in mind-numbingly repetitive rows of network traffic or server logs to be analyzed. It will literally be impossible to examine and analyze all the data available. This creates technical complexity that must be foreseen and planned for. Policies must be in place that provide the analyst with the training, software, and hardware required to make sense of the mountains of data they will face.

Consider the case of an employee using his government computer to store and distribute child pornography. He determines that he is under suspicion and deletes all the images from his hard drive and all e-mail from his online account used to distribute the images. The team sweeps in and

seizes his computer. He sits back and smiles, calm in the knowledge that he cleared his computer of the evidence of his misdeeds. What he does not know is that deleting a file only removes the pointers in the file system that identify the location of the file. The file is still there, complete and intact at this point. The operating system has marked the space occupied by the file as unallocated space that is available for future file storage. Immediately after the deletion, the file can be completely recovered. As time passes and the computer is used, the file will eventually be overwritten as other files are saved. But even then, the files may not be completely overwritten. Files are written in clusters. If the file system is set up to use 4 kilobyte clusters (8 512 byte sectors), then writing a 100 byte file will use an entire 4 kilobyte cluster with the 100 byte file taking up the first 100 bytes in the first sector. The remaining 3,996 bytes will be a remnant from the file that was stored there previously and can be recovered. This is sector slack and file slack and can be a vital source of information, particularly when the subject matter being sought was at some time stored on the hard drive. But there is no index to this data. It must be found using special tools that allow the analyst to search for keywords or file signatures to identify this evidence. The same is true for unallocated space, which, on most drives, is a huge area containing complete files and bits and chunks of others along with a lot of completely empty space.

Special tools may be needed even for files that remain intact on the system. They may be password protected or disguised to look like some other type of file. A system file in the \\Windows\System32 directory with an innocuous sounding name may actually be a graphic file containing contraband. For this reason, it is necessary to use tools that allow the analyst to search for files based on the file signature rather than the file extension.

There are hundreds of special software packages that are available for different types of analyses. An analyst will likely have been trained initially to use many different programs in an ad hoc manner to fully learn the science of analysis but will have long since moved on to use one of the several forensic suites that are available, such as Encase, FTK, or X Ways, three of the most well known. These suites offer an all-in-one solution to analysis, including imaging of the hard drive, search-string capabilities including global/regular expression/print (GREP), ability to carve files out of unallocated space based on file signatures, viewers for virtually every type of file within the program, and the ability to integrate other tools fairly easily. When an analyst becomes comfortable with one of these suites, there is a tendency to use that suite to the exclusion of all other tools. This can be a mistake. It is always a good idea to triangulate findings by using different tools to confirm the analysis. This is not only good practice, but it provides much comfort to the analyst defending his work on the witness stand. The court expects that the analyst will continually test the tools he or she works with on a daily basis and will be knowledgeable enough to explain why they do or do not work in a specific situation. Management should be cognizant of this fact and ensure that policies and procedures promote a methodological approach to forensic activities that incorporate triangulation using a variety of tools.

8.4.4 Lessons Learned

The forensic portion of the response is designed to gather evidence in a way that makes it admissible in court, but in many situations, it will be difficult to identify an individual to prosecute. In cases involving employee misconduct, the subject of the investigation is known, but it will not always be possible to determine the identity of an attacker in a network intrusion incident. In those cases it is more important that the analyst focus on identifying specifically what happened, how it happened, the potential cost or harm to the organization from the incident and to identify policies and procedures that should be modified to prevent similar

future attacks or to respond to them more effectively. To do this, the analyst must be able to pull data together from a variety of sources and draw appropriate conclusions related to the incident. Every incident is a test of policy, a test of procedures, a test of tools, and a test of the readiness and capabilities of the response team.

8.5 Summary

Incident response begins well in advance of any actual incident. Policies and procedures are necessary to set the stage for incident response and create the legal environment conducive to an effective response. Response team members should be selected and fully trained in advance and tools for the response effort, including the forensic response, should be tested and ready prior to the incident. A reporting and communication structure should be in place that allows rapid involvement of the proper response team members as soon as a potential incident is recognized. Monitoring and forensic tools should be proactively in place gathering data that will be helpful once an intrusion or other incident is underway. Forensic tools and capabilities should not be considered a separate discipline but should be incorporated into the information systems life cycle. Management should recognize the specialized nature of forensic tools and analysis and be prepared to implement policies and procedures and to supply training and tools to support the forensic component of incident response capabilities.

Finally, not all incident responses will result in a trial or other type of hearing. Often the perpetrator will remain unknown. But the opportunity to learn from the incident and refine policies, procedures, and response capabilities to better protect the organization's assets is important and should not be overlooked.

References

Britz, M. T. 2003. *Computer forensics and cyber crime: an introduction*. Upper Saddle River, NJ: Pearson Prentice Hall.

Chisum, W. J., and B. Turvey. 2000. Evidence dynamics: Locard's exchange principle & crime reconstruction. *Journal of Behavioral Profiling*. Vol 1: No 1.

Department of Homeland Security. 2008. Legal division handbook. Ed. B. Cauthen. Glynco, GA: Federal Law Enforcement Training Center. http://www.fletc.gov/training/programs/legal-division/legal-division-handbook.pdf/view (Accessed October 1, 2008).

Florida Department of Revenue. Rev. 2005. Policy # DOR-SEC-004, Information security policy. http://dorweb01/library/ISP/ndu/infsecpol.pdf (Accessed January 9, 2009).

Kent, K., S. Chevalier, T. Grance, and H. Dang. 2006. Guide to integrating forensic techniques into incident response. Recommendations of the National Institute of Standards and Technology. Special Publication 800–86. http://csrc.nist.gov/publications/nistpubs/800-86/SP800-86.pdf (Accessed December 9, 2008).

Mandia, K., C. Prosise and M. Pepe. 2003. *Incident response & computer forensics*. Emeryville, CA: McGraw-Hill/Osborne.

Mason, S. 2007. Authentic digital records: laying the foundation for evidence. *The Information Management Journal.* September/October: 32–40.

Middleton, B. 2001. *Cyber crime investigator's field guide*. Boca Raton: Auerbach Publications.

Nolan, R., C. O'Sullivan, J. Branson, and C. Waits. 2005. First responders guide to computer forensics. Carnegie Mellon Software Engineering Institute. www.cert.org/archive/pdf/FRGCF_v1.3.pdf (Accessed December 3, 2008).

Nolan, R., M. Baker, J. Branson, J. Hammerstein, K. Rush, C. Waits, and E. Schweinsberg. 2005. First responders guide to computer forensics: advanced topics. Carnegie Mellon Software Engineering Institute. www.cert.org/archive/pdf/05hb003.pdf (Accessed December 3, 2008).

Scarfone, K., T. Grance, and K. Masone. 2008. Computer security incident handling guide. Recommendations of the National Institute of Standards and Technology. Special Publication 800–61, Revision 1. http://csrc.nist.gov/publications/nistpubs/800-61-rev1/SP800-61rev1.pdf (Accessed December 9, 2008).

Schwerha IV, J. J., 2004. Cybercrime: legal standards governing the collection of digital evidence. Information Systems Frontiers; 6, 2; 133–151.

Thornton, J. I., 1997. The general assumptions and rationale of forensic identification. In *Modern scientific evidence: the law and science of expert testimony*, volume 2, ed. D. L. Faigman, D. H. Kaye, M. J. Saks, and J. Sanders. St. Paul: West Publishing Co.

Chapter 9

The Development of Electronic Journal Infrastructure

Peter M. Webster

CONTENTS

9.1 Introduction

Today's researchers have come to expect access to extensive collections of online journal material through their local academic library. University students and faculty in particular rely on being able to immediately access most of the scholarly journals they require in electronic form online. Materials available online include peer reviewed journals in all academic fields, but non-peer reviewed, discipline-related, and professional journals and newspapers are also important, as is the growing body of government and additional primary source materials. The wholesale movement of the world's academic and related journal literature from paper to electronic has been an impressive achievement. However, the popular view is that virtually all the world's journal literature is readily

discoverable by free Web search, which is not yet the case. Nevertheless, the collection of online journals is vast and moving rapidly toward being comprehensive.

From its beginning, the World Wide Web has offered great possibilities for enhancing the capabilities of scholarly communication. Realizing these possibilities has required the development, organization, and funding of an extensive, integrated worldwide electronic journal infrastructure. This infrastructure is comprised of not only large private and public repositories of fulltext content, but also global repositories of indexing information, and an increasingly standardized system of local servers for linking researchers to materials licensed for their use at individual libraries. It is this infrastructure that makes easy and seamless search and discovery of available online journal collections possible. The result has been to put greatly increased amounts of journal literature into the hands of students and researchers. A recent study found that academic libraries have increased materials they can make available to their users by between 4 and 20 times [Kohl, 2006]. Research by the Centre for Publishing at University College London found that online access to a sample scholarly journal increased by 143% between 2003 and 2005, largely due to Internet searching of journal articles [Mayor, 2006].

This chapter will explore the technical and organizational challenges involved in converting the worldwide body of scholarly journal materials from paper to online accessible form. There are several independent steps in the process of making all journals' content both searchable and accessible online. This discussion will consider both the work that has been completed and the work that remains for reaching the goal of a complete fulltext archive of the world's journal content, and the task of creating an accurate and comprehensive Web-searchable index to this material. It will consider the challenge of providing seamless integrated, cross-searchable, and cross-linked access to multiple different fulltext repositories. Finally, the chapter will discuss the fundamental challenges and opportunities that the online scholarly journal environment presents to the process of scholarly discourse.

9.2 Paid Access Journal Content

The building of a global electronic journal network has not, for the most part, been a highly centralized and coordinated effort. It has ridden on the back of the larger coordinated effort to develop the capacity of the internet itself. Important agencies, such as the National Science Foundation in the United States and the Joint Information Council (JISC) in the United Kingdom, have been instrumental in fostering elements of the emerging online environment. But the journal network has largely been built through substantial investment and effort on the part of individual private enterprise and nonprofit journal publishers and vendors, government agencies, scholarly societies, academic libraries, and consortia. Through this cooperative but largely *ad hoc* effort, these organizations have collectively invested heavily in the last two decades in journal infrastructure. The achievement of an online journal environment is all the more impressive because it has been achieved largely without central funding and control. It is a highly decentralized, loosely standards-based collection of private and public, closed and open access repositories. It is, nonetheless, a critical infrastructure that underpins worldwide scholarly research.

The body of scholarly online journal material is very large, but it remains difficult to determine the exact size of a collection that now covers several hundred years of publishing. There is overlap between materials available directly from publishers and materials accessed from other suppliers, and collections of material are counted in different ways. The journal access and hosting service, IngentaConnect, currently indexes over 31,000 journals and reports providing access to

25 million documents (IngentaConnect). EBSCO Company, one of the largest electronic content aggregators, provides access to some 20,000 online journals, containing approximately 21 million journal articles [Desmond, 2008]. Proquest CSA, another major aggregator of journals and other academic materials, describes itself as the largest distributor of online newspaper content in the world, offering over 9,000 titles, and over 125 billion pages of online material (Red Hat). The non-profit journal archive, JStor, makes approximately 1,200 journals available (JStor. Journals). The largest scientific, technical, and medical publisher, Elsevier, currently offers approximately 2,500 online journals through its online database *Science Direct* (Science Direct). The Springer Company publishes approximately 2,000 journals (Springer Link). The recently merged Wiley and Blackwell companies now make approximately 1,400 academic journals available on the Wiley InterScience online platform (Wiley InterScience). As one example of the scholarly associations, the Association for Computing Machinery offers database access to over 900,000 distinct articles [Flood, 2008]. Research by Michael Mabe indicates that there were approximately 23,000 peer reviewed journals in production in 2007 [Mabe, 2008]. He also suggests that more than 100,000 peer reviewed journal titles have been published [Mabe comment posted to LibLicense-l, Nov. 6, 2008]. Research by Carol Tenopir comes up with a similar figure, putting the number of peer-reviewed journals at 25,000 [Mabe comment posted to LibLicense-l, Nov. 6, 2008]. The Ulrich's Periodicals Directory, usually seen as the most comprehensive source of information about published serials, currently lists more than 300,000 active publications, both paper and electronic.

Academic publishing is a very diverse activity. Michael Mabe's review of scientific, technical, and medical publishing found that 33% of publication is done by commercial publishers, 54% by learned societies, and 13% by university presses [Mabe, 2008]. This number does not address the fact that a substantial portion of learned society and university press materials are made available at least in part via commercial vendors. There are many thousands of academic publishers that publish only one or a handful of journals. However, Mabe also reports that of over 2,000 scientific, technical, and medical (STM) publishers, the top 100 publishers account for 67% of journal publication [Mabe, 2008].

Commercial electronic journal publishing is becoming ever more centralized. In recent years, corporate consolidation has seen the Elsevier Company absorb Academic Press; the Proquest and Cambridge Scientific (CSA) online content companies have come together; and the major international publishing companies, Blackwell's and Wiley, have also merged. A growing amount of fulltext content is becoming freely available on the Internet, provided by a number of open access sources. But the great bulk of journal content remains carefully locked away in paid online databases. Some of this information may be searchable online because several major publishers allow their content to be indexed by Google, Yahoo, and other search engines, but the fulltext itself is only available to paid subscribers. The largest part of the global collection of scholarly literature can be accessed from a dozen large publishers and content aggregators.

Key publishers like Reed-Elsevier, Wiley-Blackwell, and Springer have led the development of a network of online academic journal sources. Aggregators such as the W.H. Wilson Company, EBSCO, Proquest-CSA, and Thomson Gale have developed the online search and access software, and the tools for storage, management, and user access to the electronic journal network. Academic societies, like the American Science Foundation, the Association for Computing Machinery, the American Psychological Association, and non-profit journal hosting services like Project Muse or Jstor have also been important in the development of online scholarly journal collections. These vendors of electronic journal content, both commercial and non-profit, have developed large collections of digital materials, and have invested heavily in user access software, data storage, and network infrastructure to support these collections.

An important component of the transition from paper publishing to online access has been increased Internet capacity and reliability. The larger electronic journal applications have become available through Internet2 and associated high-speed academic research networks such as GEANT in Europe, JANET in the United Kingdom, and CANARIE in Canada. Access to these government-funded research networks has provided the multi-gigabit bandwidth, which provides the speed and reliability necessary for ongoing, day-to-day reliance on electronic access to journals, rather than more secure local access to paper.

The initial development of commercial available online journals was an important achievement. But, at first, it resulted in only the most popular and easily available materials being made available online. The challenge of making online collections comprehensive still remained. Because the creation of online journal collections has been a commercial venture, it represents a large and growing ongoing cost to be borne largely by academic libraries. Access to this paid content is limited and restricted to institutions that can afford high subscription costs. Because online content has been created by many difference publishers and producers, it has created a highly fragmented body of materials. The challenge of integrating this material for easy access still remains.

9.3 Indexing and Abstracting

The objective of online journal infrastructure is to provide fulltext of journal articles. But having fulltext content available is of limited value unless needed material can be easily discovered by researchers. The creation of online indexes to material is as important and challenging as simply making databases of material available. Indexing allows searchers to find out what articles are available on a particular topic or contain particular keywords. Indexing alone does not deal with the problem of getting an actual copy of desired articles but only with the business of discovering their existence.

Of course, the effort to provide index access to scholarly and other journals began long before the coming of the Internet. Paper indexing and abstracting tools for finding journal articles have existed since the beginning of the 1900s. The H. W. Wilson Company began its *Readers' Guide to Periodical Literature* in 1901 [About H. W. Wilson Company, 2009]. The American Psychological Index began in 1898 and expanded to become *Psychological Abstracts* in 1920 (APA – PsycINFO). The U.S. National Library of Medicine began *Index Medicus* in 1879 (National Library of Medicine). Many of today's full text journal sources grow naturally from paper indexes. Publishing companies first put their paper indexes online, then added "fulltext" content to enhance existing indexing databases. Thus, former indexing companies have become aggregators of content. Companies like EBSCO, CSA Proquest, and OCLC [2009] are major resellers of content licensed from publishers. In many cases, these aggregators have taken on the task of converting publishers' content from paper to electronic and adding it to the growing body of electronic content.

The first generation of online journal indexing tools were converted versions of paper indexes. These were first made available largely by pay-per search database services such as BSA and DIALOG [Bjorner, 2003]. A breakthrough in cost and availability came in the late 1980s, when formerly paper indexes began to become available first on CD-ROM and then as continuously updated online products.

The *Modern Language Association Bibliography, Biological Abstracts*, or *Science Citation Index* are examples of discipline-specific indexes, which existed as core academic tools in paper volumes before they became online tools. Scholars have long relied on these indexing tools to locate individual journal articles by subject. Even online indexes made research a multi-step process of

first finding references about a topic and then secondly locating the materials referred to. Before the development of large amounts of online fulltext journal content, indexing sources formed the core of an online infrastructure to organize and discover electronic journal materials. Many paid index products, both simple tables of contents indexes and enhanced abstracting tools, remain central to the serials infrastructure. *Web of Knowledge* and *Biological Abstracts* from Thomson Scientific, H. W. Wilson Company's collection of popular index tools, *Sociological Abstracts*, or *PsychINFO* from the American Psychological Association are a few examples of key online subject specific indexing tools. Thousands of free, Web-searchable indexing tools are also developing in most subject areas.

Indexing of large amounts of scholarly journal material by major Web search engines has been ongoing for several years. In February of 2004, Google and the e-journal access service, Ingenta PLC, partnered to index Ingenta's large e-journal database. Google harvested Ingenta's metadata at a rate of 20,000 to 30,000 pages per day and at first allowed article titles, keywords, author names, and abstracts to be searched via Google. By March 2004, Ingenta allowed Google to access fulltext from their database. This allowed words in articles, not just the abstracts and keywords, to be indexed and searchable on Google. Under this arrangement, Google searchers are directed to article descriptions and abstracts on Ingenta. They are then allowed to connect to the fulltext if they have an appropriate subscription or they are offered pay-per-view (Ingenta). Many content producers, including Springer Wiley and EBSCO, have also made large portions of their journal content accessible to be indexed by Yahoo and Google and other search engines.

Google Scholar and other general search engines remain very far from being complete or comprehensive in their coverage. Despite indexing efforts by the search engines, subject and discipline-specific indexing and abstracting databases (both paid and freely available on the web) continue to provide the most authoritative and comprehensive access to journal literature in particular fields. The Educational Resource Information Centre (ERIC) database and the PubMed database of the National Library of Medicine were early examples of freely available online indexing sources with a strong government mandate to collect journals and other material in a particular subject area.

Although a great deal of material is now accessible, the indexing of scholarly journal content on the Web is not close to universal. The World Wide Web is particularly lacking in older materials, which existed in paper before the advent of digital materials. As long as great amounts of material are either not available online at all or are only available through paid sources, then indexing of this material will be an essential way to identify and locate material. Without indexing, a large amount of material remains undiscovered and is lost to researchers who would use that material. So, the challenge of creating a permanent, freely available comprehensive index of scholarly materials remains uncompleted and should be the goal of online journal publishers and vendors, as well as libraries and researchers. There are a number of ways to create this comprehensive online index. It is in the interests of all users of academic journal articles to encourage vendors and publishers to make their complete inventories available to search engines like Google. Libraries will need to be involved in identifying what is currently discoverable on the Web and what is not and then work with publishers to fill gaps in coverage and make missing materials available.

9.4 Open Access

The largest portion of online journal materials are accessed from subscription and fee-based services. However, a growing part of the scholarly literature collection is becoming available free of

charge over the Internet. Because of the high cost of commercially produced scholarly journals, and because of the restrictions paid materials place on access, there has been a movement to "Open Access" publishing, where the output of many academic journals is made freely available via the Internet. Open Access publication is being matched by Open Access deposit or distribution, a process whereby authors make their publications freely available online, either before publication as "preprint" materials or at some time after publication.

Strong pressure from researchers and universities resulted in many publishers agreeing to allow authors themselves and the home institutions of scholars to post the scholarly output of their institutions to the World Wide Web. EPrints, a central organization advocating and promoting Open Access publishing, reports that 95% of publishers now permit authors to make their work freely available over the Internet either before or shortly after publication (EPrints). Most commonly this is done through institutional repositories, Web indexes, and accessible servers maintained by universities. These institutional repositories adhere to a common set of standards called The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). This protocol sets out common methods for describing online material and for making it accessible in many repositories to be searched via Web search engines and to be indexed, or "harvested" by central archival indexing servers. The Open Archives Initiative is a key effort to make online materials, including journal materials easily accessible via Web search.

In several disciplines Web-accessible pre-print and journal article index services have become standardized tools for exchanging journal information between scholars. The ArcXive e-print database in physics is one of the oldest, started in 1991. Repositories like ArcXive attempted to make journal articles freely available to be shared by scholars and to make articles available much more rapidly than conventional publication. Academic libraries and researchers in many fields have been concerned for many years about the high cost of academic journal literature, and the tight restrictions placed on access and dissemination of these materials. By the late 1990s, the scientific community was calling for free Internet access to research information. Self-publication of article preprints by authors was becoming common. Scholarly journals that made their articles freely available on the Web began to be created. The Association of Research Libraries (ARL) created Scholarly Publishing and Academic Resources Coalition (SPARC) in 1997 to promote more open and cost effective alternatives to scholarly publishing. In 2002, the Budapest Open Access Initiative conference resulted in a statement of "open access" principles for scholarly literature, which clearly set out a common definition of open access, including "free availability on the public Internet" allowing users to "read, download and copy, distribute, print and search." This statement asserts that open access materials should be "without financial, legal, or technical barriers." The statement also calls for the "self archiving" by scholars of their research in online open archives [Budapest Open Access, 2002].

These principles were further refined during meetings at Bethesda, Maryland, and Berlin, Germany, in 2003. Since then, thousands of journals have become freely accessible, and many new open access journals have been created.

It is important to keep in mind that so far open access journals represent only a small part of the scholarly journal literature. The Directory of Open Access Journals (DOAJ) is one of the most complete listing for open access materials. It currently lists over 3,700 open access journals of which 1,300 are searchable via DOAJ at the article level. There are more than 23,000 active, peer-reviewed journals and many more scholarly journals that are not peer reviewed. The three largest scholarly online publishers, Elsevier, Springer, and Wiley–Blackwell, publish more than 5,500 scholarly journals between them. So far, Open Access publishing remains a small part of the overall body of material.

This is not to downplay the importance of open access publishing. The Open Access publication has developed very quickly to meet the challenge of making academic research freely available for all to discover and access. The open access principles are being widely accepted. In December of 2007, the European Research Council (ERC) released its Open Access Guidelines, which focus on open access to academic materials. The Guidelines note that scientific research in Europe is generating "vast" amounts of scientific publication and research data, and that free and efficient access to this information is essential. They also highlight the importance of the peer-review quality control of scientific research. The guidelines note that over 400 institutional research repositories are available to European researchers in addition to international discipline-specific repositories. PubMed for life sciences and medicine, the arcXive Internet preprint archive for physics and mathematics, the DDBJ/EMBL/GenBank nucleotide sequence database, and the RSCB-PDB/MSD-EBI/PDBj protein structure database are specifically mentioned [European Research Council, 2007].

This major research funding organization went on to set out a position requiring Open Access deposit of scholarly research, which is funded by them. The ERC requires that all peer-reviewed publications from ERC-funded research projects be deposited on publication into an appropriate research repository. Again, they specifically note the PubMed Central and ArcXive repositories as examples. The ERC requires that primary research data be deposited to the relevant open access databases and requires both publications and data to be deposited within six months of publication [European Research Council, 2007].

In January of 2008, the National Institute of Health in the United States also implemented an open access policy for its funded research, requiring that all investigators funded by the NIH submit their publications to the PubMed Central repository to be made publicly available no later than 12 months after the official date of publication [National Institute of Health, 2008].

Harvard University had recently approved a far-reaching open access policy. In April of 2008, Harvard approved a policy that requires all articles published by Harvard scholars to be made freely available on the Internet via the university's local deposit server [Guterman, 2008]. With most publishers allowing self-archiving of scholarly articles, and with granting agencies requiring open access to funded research, it seems likely that open access to academic articles from university repositories will move toward universality. However, so far open access scholarly publishing is a small, if important, part of a much larger for-profit online publishing environment. Open access publishing and archiving is not showing signs of replacing for profit publishing. It remains to be seen how the two will work together to provide widespread access to scholarly research, and how the extensive costs of the online journal environment will be met.

9.5 Backfiles

The development of a body of fulltext online journal content has not been a single process. It has been divided into several important stages. The first stage was the creation of online indexing to available paper journal materials. The growth of an online body of recent journal materials came next, along with a movement toward journal materials being published in electronic form, so that they are immediately available online. These early developments revolutionized the way scholars around the world do research. Students and professors moved from searching through limited collections of paper serials held in their local libraries, to being able to access much larger bodies of material online. They benefited from the much faster, easier, and more widely accessible process. With the coming of the World Wide Web in the 1990s, early efforts at

creating online journal repositories were almost exclusively focused on making a body of fairly recent material easily available. Publishers digitized a body of their most recent content first. This is understandable. Because of computerized word-processing and computerized publishing, all journal content was available in electronic form from its creation. By the 1990s, publishers were creating journals using computer technology and producing journals in both print and electronic form. The investment in online infrastructure to host large databases was considerable but the cost of moving "born digital" materials to the World Wide Web was small compared to the task of converting former paper publication to online form. For the first decade of the movement to online serials, the previous few decades of scholarly journal content was all that was commonly available.

The next stage of the development of electronic serials, which has taken place in the last five years, is a more difficult challenge and perhaps more important. Retrospective conversion is the very large task of converting the existing body of scholarly literature in paper to electronic form. Major publishers undertook large retrospective conversion projects for publications beginning in the early 1900s. Many of these projects are still ongoing. Even the largest publishers have not retained anything like a complete set of the journals they have published. Archiving of the world's scholarly journal literature has for more than a century resided in the hands of libraries. Large academic libraries, and several key national libraries, have been the most reliable repositories. So the creation of digital backfiles has involved partnerships between large publishers and major libraries.

Elsevier publishing began a major project in 2000 to digitize their complete backfile dating back to the early 1800s. Working with several major libraries, Elsevier spent a number of years locating, clearing copyright, and then digitizing its journal collections back to volume one, issue one [Hunter, 2002]. Although largely completed, this process is still ongoing. Much material has already had to be rescanned to improve reproduction as better methods of scanning have become available [Flood, 2008]. The medical journal "Lancet" began publication in 1823; the scanning of this journal was an important feature of Elsevier's digitization effort [Hunter, 2002]. Wiley InterScience began digitization of their backfile in 2005. The earliest journals in their collection date from the 1790s (Chemeurope.com). Other large publishers have also gone through the process of locating and acquiring rights for, and then digitizing their deep backfiles. Electronic content vendors like Gale and Proquest are also scanning enormous collections of historically important government documents, trade journals, and newspapers. Both collections now date back more than 500 years [Flood, 2008] (Red Hat). Publishers have taken on the work of digitizing backfiles for commercial gain. However, they must recover their costs for this retrospective conversion effort, so backfile collections are sold to libraries separately from recent database collections, at substantial additional cost.

National libraries have a long term mandate to maintain an archive of the publishing output of their countries. National libraries have extensive collections, often holding the most extensive collections of scholarly journals published in their countries. The British Library has one of the most extensive collections of journal literature in the world. It has also been a major source for complete collections of journal holdings [British Library]. The British Library is actively promoting the benefits of digitizing the paper collections and now operates a digitization services office to work with copyright holders wishing to locate and digitize the archive of their materials so that they can be made available online [Wijnen, 2007]. The National Library of the Netherlands, the Koninklijke Bibliotheek (KB) [2005], has also taken a central role in the archiving of online serial content. This library partnered with Elsevier Science to act as a critical source for copies of Elsevier journals in paper and serves as a permanent archival repository for the collection Elsevier

has digitized [Drake, 2002]. The National Library of the Netherlands has since signed archiving agreements with Springer and Sage among other large European journal publishers [Koninklijke Bibliotheek, 2005; Sage, 2005]. Major university libraries have also been involved in amassing the paper materials and partnering with publishers in the effort to digitize backfile collections. In addition, they are involved in scanning and making collections of locally important materials and locally published academic journals available. Discussing a recent inventory of historical materials at The University of Pennsylvania, Michael Ockerbloom noted large amounts of potentially copyright-free journal material, which is not yet available online [Ockerbloom, 2006]. Despite digitization efforts by large publishers, the body of useful older paper material yet to be digitized remains very large.

9.6 Preservation Issues

Until the advent of the World Wide Web, the long-term preservation of the world's scholarly literature was largely in the hands of libraries, which held sets of journals in paper. The national libraries, along with major academic and public libraries, played a key preservation role. Many hundreds of different libraries held duplicate sets of journals, so the overall effect was multiple redundancies, and a reasonable system for ensuring that past scholarly output would continue to be available. In recent years, libraries have moved from paper to online journal collections in a massive way. Many libraries have ended nearly all their paper subscriptions to scholarly journals. They also often lease, rather than own, online journal databases, simply paying an annual fee to use a particular collection of journals or individual online journal subscriptions rather than having any long-term ownership rights.

The responsibility for preservation has, to some extent, shifted back to journal publishers that are partnered with key national libraries and large research libraries. Most publishers had not made any systematic effort to retain paper collections of their own journal publications with collections dating, in some cases, back into the 18th century. They are creating new, vast electronic repositories of journal content, which must be diligently preserved for the future as computer technologies evolve and commercial fortunes change. National libraries have become involved with publishers in creating facilities for long-term preservation of digital materials, continuing their preservation role in a new environment. The nationally funded National Digital Information Infrastructure and Preservation Program (NDIIPP) carries on this work in the United States (Library of Congress), as does the Digital Preservation Coalition (DPC) in the United Kingdom (Digital Preservation Coalition). A growing number of libraries participate in a shared digital archiving program called "Lots of Copies Keeps Content Safe" (LOCKSS). The efforts which have been undertaken so far only partly address the large challenge of permanently preserving not only scholarly journal output, but also the growing body of related research materials, which can accompany it. As online collections continue to grow, and digital storage media change rapidly, preservation will become an ever more critical element of the online journal environment.

9.7 Integration of Infrastructure

As the volume of online materials continues to grow, there are innumerable different sources of scholarly content. Centralized indexing covers only limited selections of materials, and even where

indexing information is available, it still leaves the task of locating fulltext. In the last five years, libraries have begun addressing the new challenge of integrating many diverse sources of online information to create a unified information environment. Libraries have introduced new computer infrastructure to help connect users to diverse content. They have deployed a critical layer of integration software, which is becoming increasingly important to tie the whole electronic content environment together so that it is more usable and accessible.

Link resolvers are a key component of the new integration software being used in libraries. Link resolvers are server applications that maintain a database record of the individual journals and their available date coverage for each online database package, or individual journal subscribed to or otherwise available to each library. When a researcher searches any online database, the results can be checked against this link resolver knowledgebase, so the researcher is offered a link from journal article references found in one database source to the fulltext articles available in any source their library has available. Virtually all online journal database companies have built connections to link resolvers into their databases. The ExLibris Company first offered its SFX link resolver product to libraries in 2000 [Grogg, Ferguson 2003]. Several other companies, including OCLC, Serials Solutions, and EBSCO now also offer link resolver server applications to libraries. Google Scholar can also be configured to check a library link resolver to connect searchers to fulltext available from their local library once likely article references have been found on the World Wide Web.

Because there is no single way to search all of the diverse sources needed by researchers, federated search software has been developed. Several products including Web Feat, Muse Global, and Ex Libris MetaLib were developed to broadcast simultaneous searches to many different e-journal databases, at the same time, and return a merged set of results [Linoski, Walczyk, 2008]. Federated searching appears as a simple single search process to the end user, but the process of translating each search request and response from many sources is complex.

Libraries have maintained computer systems for cataloguing their local materials, managing library user information, and the checking in and out of books and other materials. But in the last few years, most libraries have come to rely on a much wider collection of computing infrastructure, including link resolvers and federated search applications, to deliver online journal materials and a growing collection of additional online material.

Standardization has been an essential element in the integration of diverse online journal databases into a coherent and user friendly environment. The environment could not have developed without essential standards of the World Wide Web, HTML, and XML markup languages and the PDF digital document format, as examples. To facilitate searching of multiple sources by federated search software, many e-journal providers have built XML based search interfaces that allow other applications to easily search their databases [Webster, 2007, 360]. Digital object identifier (DOI) and persistent uniform resource locator (PURL) formats have been developed to provide consistent and permanent Web address URLs for calling journal articles from databases (OCLC PERL). The COUNTER usage statistics standards were developed to provide uniform statistical information about online journal usage (COUNTER). The Dublin Core indexing standard has become an essential tool for consistent indexing description of digital documents [Dublin Core Metadata Initiative, 2009]. The OAI-PMH Protocol is another example of an important standard for integrating online materials [Open Archives Initiative, 2008].

A great deal of work has been done in the last few years to tie together diverse online information resources. Nonetheless, as the body of scholarly journal content and the number of sources of content grows rapidly, the task of integrating the fragmented information environment will remain a major challenge for some time to come.

9.8 Impact on Scholarly Discourse

The many benefits of the online environment are transforming scholarship in many ways; however, the new environment has also created a number of new challenges for scholarly research. It has raised new questions about scholarly communication. The full impact on academic and scientific discourse is still only beginning to be understood. Researchers naturally prefer the convenience of online materials and forgo the more difficult and time-consuming paper research methods. In the fast-paced world of instant communication, scholars often do not have the luxury of methodical paper-based research. Yet a great deal of older material is not yet available online, and the cost of available online backfiles is high. So the online collections held by academic libraries are often strongly weighted to materials produced only in the last two decades. The World Wide Web is, itself, a resource of newer materials. Growing reliance on the Web causes a focus on materials that are often less than 20 years old. A recent article in *Science Magazine* reported that analysis of citations in scholarly articles shows that, in the last decade, researchers have come to rely more and more on current articles and less on older articles in the literature [Evens, 2008]. The strong focus on recent sources in academic research is one of several troubling trends that will need to be addressed in the future.

Research by Steven Lawrence has also found that free online access to journals substantially increases citations to those journals [Lawrence, 2001]. Although this may not hold true for the most prestigious journals, it seems understandable that journals that are accessible free online receive greater attention, and therefore greater citation, than articles that are only available to a limited group of paid subscribers. Researchers will favor resources that are easier to discover and access. The current complex mix of free and paid, backfile and recent online content is influencing research in important ways. The favoring of easily accessible sources to the exclusion of other research is another disturbing trend to be explored.

The movement to online journals has presented new opportunities to explore scholarly communication. In the previous paper environment, it was difficult or impossible to gather information about the use of particular journals or individual articles. Publishers had no direct access to usage information. Several companies such as The Institute for Scientific Information (ISI), now ISI Thomson Scientific, developed methods for citation analysis to track how articles were being cited by other authors [Garfield, 2007]. This was a cumbersome process requiring specialized and costly data processing. In the online environment, publishers have centralized access to detailed journal and article usage information. Each library can easily track journal use at their institution. Citation analysis information is available from many journal database products and even from Google Scholar. Impact factors and other measurements of the relative importance of difference journals have become important in many disciplines. The online journal environment makes many valuable new assessment tools available. However, there is concern about over-reliance on such statistical methods over more qualitative assessment of scholarly endeavours. There continues to be debate about appropriate uses of abundant new sources of information on use and impact of academic journals.

Many disciplines have adapted to the wide-reaching systems of article preprint archiving and rapid information sharing. Fields such as physics and medical science are particularly advanced in this area. Other fields, particularly in the humanities, have less fully developed systems for online scholarship.

In its recent *Guidelines on Open Access*, the European Research Council noted that unlike many of the sciences, the social sciences and humanities do not yet have openly accessible public repositories for the archiving of journal preprints, publications as well as primary and secondary

research data. These Guidelines also suggest that access to research materials is often hindered or restricted by private or government ownership [European Research Council, 2007].

The *European Research Council Guidelines on Open Access* [2007] also requires that all research funded by the Council be made available in open online archives. They state that this is partly done in an effort to foster the growth of open access and online scholarship in fields where it is not yet developed [European Research Council, 2007]. Fully developing online scholarship across all academic disciplines remains another important challenge still to be addressed.

Current efforts to build the electronic scholarly literature environment still focus on converting former paper to online readable form, the conversion of documents to portable document format (PDF) and various image and text formats. A number of writers have pointed out that available online multimedia tools make it possible to present information in far more expressive and effective ways than is possible with paper presentations [Lynch, 2007]. The use of basic static diagrams and images in paper literature is an expedient limited by the means available to reach a mass audience. Much scholarly publishing continues to offer black and white images and very limited space for supporting data or documentation. The digital environment is, by its nature, much richer. Color imagery, animation, unlimited volumes of supporting documentation, and real-time reader feedback are basic components of today's online environment.

Looking at the basic structure of academic publishing, the very existence of individual academic journals has been questioned. Because the basic unit of academic discourse and exchange of information is the journal article, and most journal articles are located and accessed through a larger search engine or online database, there is a case that scholarly journals as an entity should be dispensed with. In a recent article entitled "The Journal is Dead, Long Live the Journal," Danny Kingsley makes this case. Kingsley states that "the internet offers a vast opportunity for change to the scholarly communication system." He says that "the traditional scholarly communication system no longer supports the communication of findings."

Kingsley suggests that requirements for assessing research quality and evaluating scholarly achievement, as well as communication and retention of scholarly research, can all be better met by new online methods than by traditional publishing. He asserts that the traditional scholarly journal, with its slow publication schedules and ever rising subscription costs, is not likely to survive.

However, Kingsley states that "the journal concept of an online place where refereed fully searchable articles based on thematic ideas can be collated, with hyperlinks to relevant grey literature will remain" [Kingsley, 2007]. It is Kingsley's view that needed changes to scholarly publishing are being held back by the "stranglehold publishers have on the communication system, the reluctance of academics to change, and the entanglement of the reward system with the current publishing scenario." Kingsley does, nonetheless, acknowledge that publishers and academics are beginning to embrace new models of communication, which will ultimately transform scholarly discourse [Kingsley, 2007].

Discussion is ongoing over how to create a new and better scholarly publishing system. A number of agencies have undertaken recent reassessments of scholarly communication. In 2007, the National Science Foundation and the Joint Information Systems Committee (JISC) produced an important workshop report entitled "The Future of Scholarly Communication: Building the Infrastructure for Cyberscholarship" [Arms, Larsen. 2007]. In May of 2008, the Center for Studies in Higher Education (CSHE) at the University of California, Berkeley, released an interim report of an Andrew W. Mellon Foundation funded study entitled "Assessing the Future Landscape of Scholarly Communication." This report points out that the traditions and practices of scholarly disciplines remain of central importance. It states that "these traditions may override the perceived

"opportunities" afforded by new technologies" [Harley, et al., 2008]. The report suggests that a rigorous peer review process linked to professional scholars' promotion and tenure (including the needs and goals of final archival publication) "should not be confused with more informal communication through blogs, casual sharing of information, and other non-peer reviewed work" (Harley, et al., 2008). The online academic journal infrastructure is only one step in a process that is changing all aspects of scholarly activity and communication.

9.9 Conclusion

There are many issues still to be resolved as the online scholarly journal environment grows and develops. It is now possible to work toward creating a truly comprehensive collection of the world's scholarly literature online. This will involve a careful assessment of what materials are still not available online and what steps will be needed to close gaps in coverage. In the same way, it is necessary to create a complete and comprehensive web index to all scholarly materials. This task will involve prevailing on producers of materials to make their materials accessible via web search. Libraries still have important work to do to integrate the great number of diverse sources of journal material available to their users and provide seamless search and access to this great body of material.

Another important challenge will ensure that future academic scholarship is not biased in unforeseen directions by the favoring of newer or freely accessible research materials over more hard-to-access materials. The benefits of online scholarship with multimedia interactive communication, in-depth research data access, and high-speed research dissemination have yet to be fully realized. While some academic disciplines have highly evolved systems for online archiving and communication of scholarly research, other disciplines lack centralized subject specific indexes, journal pre-print, and self-archiving and research data repositories. The creation of a uniform online environment across all academic disciplines is another task for the future.

Fostering open access to scholarly journal materials is another pressing challenge. For the foreseeable future, open access publishing will coexist with paid subscription publishing. A balance must be maintained between making scholarly journal materials freely available and fairly compensating the costs of publication and dissemination. As the body of online scholarly materials expands, preserving this material over the long term will become a more difficult and complex problem. The online environment gives scholars an array of new tools for assessing the impact and value of scholarly research, but the most effective use of such quantitative tools is still to be determined.

The development of the electronic scholarly journal environment has been a great step forward. This environment has greatly improved and expanded access to scholarly materials. Journal producers and software developers along with national and local libraries have built a great body of online content, and an impressive array of network infrastructure to store, access, and integrate online journal collections. Perhaps the most impressive part of their work is the way in which they have worked together to transform scholarly communication.

References

American Psychological Association. 2009. *PsycINFO News*. Available from http://www.apa.org/psycinfo/.

Arms, William Y., and Ronald L. Larsen. 2007. The future of scholarly communication: Building the infrastructure for cyberscholarship. Workshop sponsored by the National Science Foundation and the Joint Information Systems Committee, April 17–19, 2007, Phoenix, AZ.

Bjorner, Susanne, and Ardito, Stephenie. Online before the internet: Early pioneers tell their stories. *Searcher* 11, 36–46.

Breeding, Marshall. 2007. An update on open source ILS. *Computers in Libraries* 27, (3) (03): 27–9.

The British Library (publisher digitisation service). London, Available from http://www.bl.uk/digitisationservices.

Budapest Open Access Initiative. 2002. Available from http://www.soros.org/openaccess/read.shtml

Chemeurope.com. Wiley InterScience launches extensive program to digitize journal content. 2005. Available from http://www.chemeurope.com/news/e/45825/.

COUNTER (Counting Online Usage of Networked Electronic Resources). 2009. Available from http://www.projectcounter.org/about.html.

Digital Preservation Coalition. 2009. Available from http://www.dpconline.org.

Drake, Miriam. 2002. Elsevier teams with Dutch national library for digitization project. *Newsbreaks.* Available at http://newsbreaks.infotoday.com.

Dublin Core Metadata Initiative. 2009. Available from http://dublincore.org/.

EPrints (journal policies, summary statistics so far). In EPrints [database online]. Southampton, January 2009. Available from http://romeo.eprints.org/stats.php.

European Research Council - ERC scientific council guidelines for open access, 17 December 2007. Available from http://erc.europa.eu/pdf/ScC_Guidelines_Open_Access_revised_Dec07_FINAL.pdf

Evans, James A. 2008. Electronic publication and the narrowing of science and scholarship. *Science* 321, (5887) (07/18): 395–9.

Flood, Gary. 2008. Backfile to the future. *Information World Review* 246, 10–12, May

Garfield, Eugene. 2007. The evolution of the science citation index. *International Microbiology* 10, 65.

Grogg, Jill E., and Ferguson, Christine L. 2003. Linking services unleashed. *Searcher* 11, (2): 26.

Guterman, Lila. 2008. Celebrations and tough questions follow Harvard's move to open access. *Chronicle of Higher Education* 54, (25): A14.

Harley, Diane, Sarah Earl-Novell, Sophia Krzys Acord, and Shannon Lawrence. 2008. *Assessing the future landscape of scholarly communication: An in-depth study of faculty needs and ways of meeting them.* Centre for Studies in Higher Education (CSHE), University of California, Berkeley.

H. W. Wilson. About the H. W. Wilson company. 2009. Available from http://www.hwwilson.com/abouthw/abouthw.htm.

Ingenta Connect. Available from http://www.ingentaconnect.com/.

Ingenta. Ingenta partners with Google to enable full text indexing. May 12, 2004 Available from www.ingenta.com/corporate/company/news/archive/google.htm.

JStor. Journals. 2009. Available from http://www.jstor.org/action/showJournals?browseType=titleInfoPage.

Kingsley, Danny. 2007. The journal is dead, long live the journal. *On the Horizon* 15, (4): 212.

Kohl, D. F., and T. Sanville. 2006. More bang for the buck: Increasing the effectiveness of library expenditures. *Library Trends* 54, 394.

Koninklijke Bibliotheek. Agreement on a long-term "safe place" for all Springer's e-publications at the KB. 2005 Available from http://www.kb.nl/nieuws/2005/springer-en.html.

Lawrence, Steve. 2001. Online or invisible? *Nature* 411, (6837): 521.

Linoski, Alexis, and Tine Walczyk. 2008. Federated search 101. *Library Journal - Net Connect*. July 15, 2008.

LOCKSS – What is the LOCKSS Program? Available from http://www.lockss.org.

Lynch, Clifford. 2007. The shape of the scientific article in the developing cyberinfrastructure. *CTWatch Quarterly* 3, (3).

Mabe, Michael. 2008. How many (peer reviewed) journals are there? Available from http://www.library.yale.edu/~llicense/ListArchives/0811/msg00032.html.

Mabe, Michael. 2008. STM publishing: The known knowns, the known unknowns, and all points in between. Academic Publishing in Europe Conference, 2008 Berlin.

Mayor, Susan. 2006. Search engines increase online journal use more than open access *British Medical Journal* 332, (7554): 1353.

National Institute of Health. NIH public access policy details. 2008. Available from http://publicaccess.nih.gov/policy.htm.

National Library of Medicine. Milestones in NLM history. 2008. Available from http://www.nlm.nih.gov/about/nlmhistory.html.

National Library of Medicine. Milestones in NLM history. 2008. Available from http://www.nlm.nih.gov/about/nlmhistory.html.

Ockerbloom, John Mark. 2006. The next mother lode for large-scale digitization? Historic serials, copyrights, and shared knowledge. Paper presented at Digital Library Spring Forum. Austin, TX.

OCLC - PERLS. 2009. Available from http://www.purl.org/.

Open Archives Initiative (protocol for metadata harvesting). 2008. Available from http://www.openarchives.org/pmh/.

Sage Publication. SAGE publications partners with koninklijke bibliotheek (KB), national library of the Netherlands, for permanent digital archiving. 2005. Available from http://www.sagepub.com/repository/binaries/press/KB_partnership.pdf.

Science Direct. Available from http://www.sciencedirect.com/.

SpringerLink. Available from http://springerlink.com/.

Wiley InterScience. Available from http://www3.interscience.wiley.com.

Webster, Peter M. 2007. Challenges for federated searching. *Internet Reference Services Quarterly,* 12(3/4), 35–368 12, (3/4): 357.

Wijnen, Jan Willem. 2007. *Journal backfiles in scientific publishing.* London: British Library.

Chapter 10

Managing IT in Florida: Consequences and Aftermath of the Bush Era

David H. Coursey and Jennifer Killingsworth

CONTENTS

10.1 Introduction

In just over a decade since the first graphical Web browser, the World Wide Web (WWW) has become the central component of most governments' IT efforts. Virtually every sizable government has some form of Web presence with significant online applications.

Since the previous editions of this book, the focus on Web services has changed. In the late 1990s, even the more advanced governments were just beginning to denote and implement applications. Reviews, like the previous version of this chapter, centered on innovation diffusion and

implementation. E-gov was, frankly, novel and poorly integrated into existing IT management and planning. That has changed. Governments now find an environment where e-gov is arguably the underlying infrastructure for all of IT and face significant pressure to reorganize management functions, primarily towards centralized structures. There is little real difference between an e-gov and general IT application.

What has not changed is the fundamental question posed in the previous editions: How is the new area e-gov management different from traditional IT and why? One of the greatest fallacies of public IT research has been the presumption that any new technology requires a virtual re-writing of all existing IT research. Partly, this problem derives from researchers brought into the area by the technology itself, with little traditional background in the IT literature or its practice and the tendency toward advocacy: positive, glowing stories of productivity gains with few stories of failed projects or the reasons behind their demise. For example, the common push to centralize e-gov functions toward eliminating service duplication and reducing costs is often touted as somehow new—it is not. The debate between the pros and cons of centralized versus decentralized IT management has raged for decades. Even in Florida, the state had a well-touted centralized planning unit (the Information Resource Commission; IRC) in the 1980s, which was dismantled primarily as it was seen as too centralized. Researchers should ask "what is different, if anything" first.

With the maturity of e-gov, management concerns have become more pressing than in the early days centered on application development (and usually just conversion of an existing "paper process" with no real system re-engineering first). Here, we revisit the state of Florida's e-gov era efforts. In the first two editions [Coursey and Killingsworth, 2000; 2005] we covered Florida's transition to a new Republican governor, Jeb Bush, the dismantling of most infrastructure for Web services, and push towards centralized IT management and planning with a strong emphasis on large-scale transformational projects almost exclusively delegated to privatization. Now, we review the record of Bush's policies and the resulting political and organizational reactions to what has been commonly viewed as a seriously flawed IT administration, especially in contract management.

10.2 The State of Florida: A Fallen Leader through Political Transition and Contract Mismanagement

Florida may seem an unlikely candidate as a major player in e-gov among state governments. After all, although it's the third largest state, it has a relatively small government operation compared to its sister states. Neither does Florida possess the computing, high-tech industry infrastructure so critical to efforts in Texas, North Carolina, and Washington.

Yet Florida, by many measures, was the leading state government in Web services into the Bush administration in 1998. It was chosen as the best state government operation by *Government Technology* magazine in 1996 and 1997 and so dominant that they were excluded from the competition in 1998. In the first edition, we argued that much of this success was due to very entrepreneurial management, high-level political resource support but without trying to detail plans and direction, perceived political gains having nothing to do with truly improved government service, and a strong emphasis on internal staff and state universities for development [Coursey and Killingsworth, 2000].

Since 1998, Florida is no longer the dominant leader and usually is not ranked in the top 10 by *Government Technology*. Partly, this was inevitable as other states begin to seriously address e-gov.

This is not to say overall e-gov is not better in Florida today than in 1998; rather, relatively, Florida has clearly fallen.

The story behind Florida's drop from a clear leader to arguably just another state with reasonable efforts makes the state an important, unique case. Florida's experience rests on something most states had yet to really experience: a major political transition in established e-gov management. Jeb Bush, a very conservative, proudly anti-government Republican, was a stark change from the previous moderate, Democrat Governor Chiles. One of the traditional concerns of public IT is the danger of management instability associated with too much political visibility. E-gov has been different from much of traditional IT in that it draws the attention, for good or bad, of top political officials. Bush liked to be called the "e-governor." Florida's experience is critical to understanding how much political transition can help, or hurt, e-gov management and practice and begs the question as to how to properly instill necessary stability in what is now vital infrastructure to government operations.

10.3 Florida's E-Gov Era Management History

Florida's Web presence began as a very political battle between three agencies: the Department of Management Services (DMS); the Department of State (DOS); and the Department of Education (DOE). The Web was seen, to varying degrees, by agency heads as a new area of organizational power and turf wars developed as to who would direct the state's Web presence. Early development (before 1996) was primarily due to political considerations far more than any analysis of business problems or opportunities. For example, DMS' entry can be traced to Governor Chiles' concern over a cover story in the influential *Florida Trend* magazine in November 1994, blasting the state's lack of Web progress.

The struggle for control and leadership reflected the decentralized nature of Florida's government. At the time, Florida had a clearly weak governor with much of the executive branch headed by independently elected officials. The DMS was not but the DOS and DOE were led by elected Republicans. The competition, particularly between DMS and DOS, was actually healthy in that the each tried to outdo the other in applications. Both DMS and DOS primarily relied on internal personnel and relationships with the Askew School of Public Administration and Policy's (Florida State University) IT students and centered on application development. One major difference was that DMS typically followed a cost-recovery model while DOS felt services were already paid via tax dollars and even converted existing online applications that were fee-based into free applications.

While both DMS and DOS made significant contributions, by the end of the Chiles' administration in 1998, DMS was the clear, almost default leader of the state's Web presence. However, management structure was very weak. There was no clear authority over any IT planning in the overall executive branch, primarily due to the weak governor constitutional structure and even agencies under the Governor resisted any form of centralized control, partly due to the still existing dislike of the experience under the old IRC. The DMS' service provision for various hosting and Web assistance provided, at best, informal coordination. Most agencies had their own Web operations, some quite disconnected from their normal IT management. Applications were typically agency specific with few really cutting across agency bounds or restructuring services as activities independent of the existing agency management structures.

The lack of management structure was compounded by DMS's reliance on highly entrepreneurial management under Secretary Lindner. Lindner was a very aggressive advocate for

e-gov services. He created a very unique environment tolerant of risk, supportive of government employees, and quite aggressive about creating novel opportunities for young workers on projects featuring cutting-edge technology and scale, regardless of sector. Obviously, Lindner would not be around in a Bush administration simply for political reasons. The concern, as we expressed in the first article, would be what would happen without such a central, politically supportive advocate.

The Bush administration had two clear differences in 1999. First, there was little belief in the ability of government workers to handle e-gov services. Partly, this was due to a youthful, very inexperienced Bush team's ignorance about Florida's existing stature. It also reflected a core political philosophy that trusted private sector innovation and believed private companies were more astute on Web applications.

Politics was also at play. Bush wanted to be known as the "e-gov," clearly an example of the use of the Web for political reasons, and needed to disassociate his efforts with those under Chiles as much as possible. Indeed, such highly touted innovative services like "Leasing Direct" and "Training Direct" were strongly de-emphasized and even dismantled. Unlike Chiles, Bush took a very personal interest in e-gov and dabbled far more in the details. While Chiles deferred to Linder, Bush was going to be far more proactive. Additionally, DOE and DOS were still under Republican control and quite loyal to Bush. Hence, Bush became the central IT political player, a major change from an era with competing agencies.

The transition to a dominantly private sector model, lack of experience, and political power change had significant implications in Bush's efforts. The first two years (1999–2000) are best characterized as a series of often well-intentioned, but mostly unsuccessful efforts. It is in this period that Florida lost its clear national leadership role.

Bush's advisors came into DMS presuming the state was backward in e-gov and with thinly veiled distrust of any existing e-gov personnel. Many of the best DMS Web staff had already left with Lindner, expecting just such a result. Most Bush staff had little, if any, real experience. Most glaring was Bush's choice of his e-gov leader, Roy Cales. Lacking any college degree, much less in IT, and virtually no significant IT business experience and none in government, Cales' primary qualification was a political one: he developed the Governor's campaign Web site [cf., Lauer, 2001a]. The idea that a basic Web site designer could tackle a state's e-gov efforts was at best questionable and more realistically, tragically wrong. It also sent a very demoralizing signal to the many state IT employees who were far more qualified that Cales. But, qualifications were not Cales' only problem. His ethical suitability was questionable as he admitted to felony grand theft charges from 1985, though dropped after he paid back the money [Lauer and Bridges, 2001b]. Both problems would prove his undoing two years later.

However, to begin, Bush stressed the redesign of the state's Web page, referring to it as the state's first Web portal, www.myflorida.com. The claim was partly political and simple ignorance as well as the state had long had a leading central site (the Florida Communities Network under DMS), it just did not have the "sexy," popular new term from the private sector. Bush desired to spin the state's presence as his alone. A small firm with no significant government experience, Information Builders, was contracted to lead the effort.

Like many efforts headed by Governors, it was clear that www.myflorida.com was going to be just as much a publicity page for the Governor as a general site for state government. This led to resistance among many state Web workers within agencies who found the approach inappropriate. Furthermore, even with major agencies under the same party control, resistance towards a common portal still existed as agencies wanted to protect their turf.

The Bush administration, via Information Builders, attempted to dictate look and feel to all agencies, even those outside the Governor's control, and even to go so far as require all agencies to house their Web operations at DMS. Such changes were not considered with any consultation with existing state Web personnel who were used to a rather free exchange of ideas. Rather, the Bush administration's initial approach was to tell agencies what to do with virtually no feedback or state employee involvement. The Governor was seen as trying to centralize control for its own sake and with a noticeably lower emphasis on application development. The DMS Web staff, after they had built the nation's leading Web presence, were extremely demoralized when told a private company was taking over design and management efforts. They were reduced to simply communicating the Governor's intentions and then handling the flack from the agencies. A lot of this communication came via the established DMS and state Web worker user group meetings. Roy Cales constantly missed these events, despite assurance of attendance, which just further damaged morale and encouraged an adversarial relationship.

The Web portal, while developed and launched with much fanfare, found significant resistance. The Bush administration's failure to capitalize on existing state employee expertise severely hampered development and overall quality. The Bush administration failed to recognize the importance of the decentralized personnel and did nothing but exacerbate their distrust.

The Web portal development's greatest problem was simply inexperienced leadership with a dash of too much political involvement. New directives on look and feel, and how much they were to be enforced, were constant and confusing. Many state Web workers developed a pattern of ignoring requests from the Governor's office as they came to expect almost immediate reversals or conflicting requests.

A simple but notable example of the confusion caused by inexperience and political motivation was the Governor's pronouncement that his personal e-mail address be placed at the top of every page. State Web workers warned this would generate huge volumes of e-mail, and worse, e-mail that likely concerned agency business being misdirected. Other state Web workers saw it as rather shameless political publicity. About six months after many agencies had added the e-mail address, a simple memo asked for its removal and handed literally thousands of unanswered e-mails to the agencies for processing. As expected, volumes were about agency business, and the lack of response made the agencies look bad and angered not only state Web personnel, but also general agency management.

However, the Bush's online permitting effort was by far the best example of government IT management inexperience. Bush, strongly influenced by private e-commerce innovations, envisioned a one-stop Web portal for all state permit processes. Citizens would not have to know what agency to go to for what permit and could actually complete entire permits online. Such a project was far more encompassing than anything under Chiles and at the time, would have been a clearly unique application among state governments.

However, the lack of government experience, and willingness to consider state experts who warned of the potential project problems, directly led to a miserably failed project, at least in intended scope. First, Bush incorrectly assumed agencies could define all their permit processes. They could not, and even agencies very dependent on such work, like the Department of Environmental Protection, were plagued by the lack of permit documentation. Out of date forms were common. Historical knowledge and expertise on the purpose of various permit items was often long gone with employee turnover. Even simple listings of all permits and associated forms were scant. Second, Bush naïvely assumed permits are relatively simple forms like shopping carts on e-business sites. Hunting licenses and driver license renewals may be doable, but environmental permits are hardly single session, fast completion forms. Environmental permits can involve lots of

forms and require tremendous technical expertise to complete and, even more daunting, cut across not only state, but local and federal agencies. Hence, the state could not do such forms alone.

The failure to understand the true project scale produced the real killer: a totally insufficient resource plan. Agencies were expected to obtain all their permits up in one year without any additional resources. Even worse, Bush and the Republican-controlled Legislature felt citizens and businesses needed to be encouraged to use the new online permits and so required agencies to waive permit fees for a period after development. Agencies privately howled. Knowing such applications would likely produce huge budget losses, especially as permit fees often supported other programs and not just the administrative processing costs, agencies stonewalled.

This period, 1999–2000, is when Florida virtually stopped developing new, major applications and clearly lost its leadership edge. Permit processes that were rolled out as part of a special permitting site were, in the end, just downloadable forms [e.g., *Tallahassee Democrat*, 2000]. While the online permit project failure is not completely at fault, it is hard to ignore as a major factor. Information Builders was fired as well, as Bush became increasingly disenchanted with progress, both with the www.myflorida.com portal and the permit project.

Bush's first two years were at best unsuccessful. Existing personnel capacity was lost in favor of very inexperienced private sector firms or appointments. Attempts to develop needed, better coordination were largely unsuccessful given the top-down approach attempted with little consultation with a distrustful state Web workforce. Moreover, even though controlled by the same party, many major executive agencies remained outside the Governor's control with separately elected heads. Many claims of innovative new projects and accomplishments, or even "firsts," were dubious examples of political spin. The state Web portal already existed under Chiles', and online job bank and bidding processes [cf., Lauer, 2001a], also claimed as major accomplishments, existed under the previous Governor as well. Quite telling was the Bush administration's often cited increases in Florida's relative e-gov ranking in 2001 by sources, such as the Center for Digital Government [cf., Lauer, 2001a], which refer to changes since late 1999, the nadir of the Bush created problems and hardly a comparison to the Chiles' years.

Bush and his staff came in green. The question would be how they would learn. In 2000, the Bush administration decided the problem was decentralized IT management: too many agencies under a "silo" mentality and no real coordination or control across agencies. Certainly, Florida did not have good e-gov management structures in place. Some need for more centralized coordination was necessary.

That year, the State Technology Office (STO), under DMS, was formed (www.sto.state.fl.us). The STO, with Roy Cales placed in command, was to coordinate and assist agencies in e-gov development and operations and reduce duplication. Hailed as the state's first CIO (another dubious claim, as the IRC head in the 1980s was essentially in the same role), Cales became the state's clear, central e-gov figure. The ideal, primary plan was to centralize all state IT staff and budget under STO control, a massive centralization and one that would be unprecedented in state government. It was also one carefully watched by other states. Agencies feared lost control over IT support. Many legislators, particularly Democrats, feared too much control in one person over hefty contracts and planning, especially with Cales' personal history.

The model was definitely based on such reported efforts in the private sector trade press, and questionably based on companies with far less work complexity and even size than the state government. No doubt, some of the benefits of centralization could accrue, like reduced operational costs and better cross-agency application planning.

However, centralization also has possible, negative consequences, not realized partly due to the Bush's administration's general, government IT inexperience. Agencies develop strong relationships

with vendors, which could be put at risk by centralized decision-making. Decentralization can also encourage innovation as agencies compete for political visibility of quality applications and are free to experiment with varying approaches. Indeed, the very decentralized political scuffle between DMS and DOS was partly responsible for the state's leadership in the mid-1990s.

Laws passed over the 2000 and 2001 Legislature, established and expanded Cales' power base via the STO over agencies. Concurrently, 2002 saw a dramatic change in Florida's executive branch, with traditionally elected cabinet posts, such as DOS, becoming appointments giving the Governor far greater ability to centralize IT control. With a Republican controlled Legislature having little concern over proposed plans, it seemed Cales was set to become a virtual king of Florida e-gov and IT.

Over 2000 and 2001, problems began to emerge with Cales' past as well as quite questionable contracting. Supporters claimed such charges were personal attacks, especially from vendors not receiving awards or agencies upset over lost control. Perhaps this was true at a modest level, but it is hard to dismiss the events as just politics.

In 2000, Cales blocked a $15 million contract for laptop computers for state troopers. The intervention came only after a Congressman wrote the governor asking him to dismiss the bids and award the project to a politically connected new company [Lauer, 2001a]. Such actions were latched onto as proof positive of the dangerous political control over state IT dollars at the possible expense of quality. It also created a poor vendor environment when many long-time state vendors became distrustful as many began to assume, fairly or not, that political connections were the sole basis of awards. The incident encouraged the Legislature to keep IT money in agency budgets, though the Bush administration originally wanted all budget authority transferred to the STO. Critics were open and harsh. For example, Doug Martin, a spokesman for the American Federation of State County and Municipal Employees stated "[Cales] is still a despot … if you invest that much power in one man, the citizens of Florida are taking a big gamble. Is he going to use that power for taxpayers' benefit or the benefit of politically connected companies?" [Lauer, 2001a, p. A1].

Meanwhile, further details of Cales' past began to surface. The 1985 felony grand theft charges were well known at appointment. But it was discovered that Cales' state job application was a bit short of honest. First, there was the claim that he supervised 20 employees with his company before working for the state. Cales claimed he was including contracted workers. The reality was that his company, Gencom, had only two, including Cales. Second, he failed to mention the felony grand theft charges on his application with the excuse that the form asked if one were ever convicted of a felony.

Just after Cales took highly publicized new powers via the STO in July 2001, with even more proposed centralization in the 2001 session, the bubble burst. In August, Cales was charged with grand theft for forging a document (claiming a contract with a local media outlet) to secure a bank loan in 1996—three years before his state job. He resigned, claiming he did not forge the document though it was clear the document included a forged signature as even the company representative's name was misspelled. Cales was forced to resign and the Bush administration was left with a serious public relations nightmare and threat to its consolidation plans [Lauer and Bridges, 2001b]. Cales would be acquitted in 2003, after the state prosecutors and law enforcement lost the crucial evidence—the forged document—which was just too fortunate for many Bush critics [Rosica, 2003].

The centralized contracting function was, perhaps, critics' greatest concern with the new STO and its powers. In 2002, a scathing report from the Auditor General cited 28 allegations of mismanagement, conflicts of interest, and legal violations in purchasing. Included were severe allegations of soliciting money from businesses with state contracts, paying for services never

received, and large contracts awarded to firms providing significant campaign donations without proper procedures or controls [Lauer, 2002a; Morgan, 2002]. In 2003, a less critical report focused more on internal problems, including the lack of written work agreements with state agencies, no designated state privacy or security manager, and no security or recovery plans [State of Florida Office of the Comptroller, 2003; Cotterell, 2003c]. All of these were requirements under the new Florida IT laws specific to the STO's role.

Much of this criticism related to the Cales' administration and arguably the disorganization in its wake. After Cales' resignation, Kate Bahrami became acting director and then in 2002, was officially appointed. Bahrami's background was significantly better than Cales' with government experience with the Department of Defense and a graduate education, though not directly in IT [Lauer, 2002b]. Under her leadership, STO addressed many of the audit criticisms, created a much needed information security office (which was recently recognized by the Center for Digital Government as one of the country's best), and made good progress toward data center consolidation. Even Democrats voiced support for Bahrami, and in general, there was far greater confidence in her professionalism than Cales'. Bahrami faced two major e-gov project challenges over the STO: one involving a complete privatization of personnel management support functions ("People First") and the other a privatization of much of the STO's core functions and data center ("MyFloridaAlliance").

The Bush administration's landmark personnel management privatization with Convergys dubbed "People First," began moving virtually all state human resources tasks to the company in 2003, with significant Web-based portions, including state employee insurance enrollment launched in September [Cotterell, 2003a; Cotterell, 2003d]. The project did address a real need: an outdated and cumbersome personnel system (COPES). To date, the conversion has been mildly successful, at least in functionality. Cost savings have proven to be greatly overestimated from an initial $93 million to $12 million [OPPAGA, 2008b]. Personnel record security is also concerning to many state employees with one occurrence of personnel records being handled overseas in violation of contract. However, several evaluations by the Office of Program Policy Analysis and Government Accountability (OPPAGA, which is similar to the federal government's General Accountability Office in responsibilities) have criticized a lack of formalized project planning, failure to implement many contracted components, and an increased workload in some cases on agency staff in personnel matters. While some of these issues have been at least partially addressed, OPPAGA recommended in early 2009 that either renegotiate with Convergys or contract with a new company and bring some functions, such as service centers, back in house [OPPAGA 2006; OPPAGA, 2008a; OPPAGA, 2009]. Overall, People First could be viewed as Bush's most successful major project, but, even so, the results have been far from spectacular and there is considerable question as to whether the state would have been far better served by building its own replacement for COPES.

Bahrami's other challenge was arranging a privatization of much of the STO's core functions. The ambitious privatization, called "MyFlorida Alliance," planned to turnover most services to two companies, Accenture and BearingPoint (though around 30 companies were involved in the venture) and transfer about 30% of its employees as well. Accenture would handle application management, including the state portal and e-gov services, while data center operation and desktop assistance would go to BearingPoint. The STO would retain its core management and planning functions and the company roles are seen as "day to day" activities.

The contract terms planned to pay the companies mostly on a guaranteed minimum plus service fees to agencies and users. For example, someone renewing his or her state driver's license would see the fee goes toward Accenture. Up to 3% (the exact percentage will depend on service use) of revenues would be paid back to the state.

The change was not without concerns. One of the most controversial aspects was free use of the state's multi-million dollar Shared Resource Center, the state's key data center, among other state offices and equipment within STO. The companies would even be allowed to work on their own client's jobs at the state location. Even worse to critics, there was a concern that the Bush administration originally planned to just give the center away or sell it grossly undervalued, a plan that even had powerful Republican legislative leadership troubled [Lauer, 2003a].

There is little doubt, the Bush administration took a huge risk with the STO privatization as their enterprise model. The seven-year deal had no firm cost and by its nature actually encouraged more work to be found, for good or bad, for greater profit. The security concerns and appropriateness of a private firm using a state facility for their own work was troubling as well. There was questionable contract control as STO shared supervision of the work with the companies via the MyFlorida Alliance governing board. There was distrust of the two companies given their recent, noted business ethics problems (Accenture is a spinoff of the former Andersen Consulting, based in Bermuda, and BearingPoint, formerly KPMG Consulting).

The unsettled contract terms spelled potential trouble considering the STO's questionable contracting legacy and the high-level political involvement in selecting contractors and terms. Almost immediately, serious ethical and managerial issues developed leading to Bahrami's resignation, MyFlorida Alliance's cancellation, and abolishment of the STO.

Soon after her appointment, Bahrami made a BearingPoint employee, Tanya Jackson, her *de facto* STO chief of staff. Amazingly, this did (at the time) not violate state ethics laws but it did raise many DMS and STO employees' concern. Though it would not be discovered until early 2005, there was cause to be worried. Jackson would stop working for the STO in July 2002, but e-mail records indicated she was still extensively involved in STO operations, including writing the request for proposals for the MyFlorida Alliance. Jackson was a close friend and Bahrami seriously deviated from typical contractual procedures as she wrote the request by herself and selected an evaluation team of new agency employees who had never evaluated a bid proposal [James, 2005]. Rumors and speculations were rampant among DMS employees about Bahrami's handling of the MyFlorida Alliance award. Despite concerns, STO signed the MyFlorida Alliance contract in August 2003.

Only five months later, Bahrami would resign citing other opportunities. In May, Simone Marstiller was named as her replacement. Marstiller did not fit the mold of the typical CIO. She was hardly, as she admitted, a "techie" but an attorney who was Bush's deputy chief of staff and formerly general council for DMS (Peterson, 2004). The two events, especially an attorney as STO head, exacerbated rumors of impropriety in the MyFlorida Alliance award.

Bahrami's resignation and the appointment of a new, high-level legally trained political operative signaled the Bush administration knew what was coming, a scathing Auditor General report citing mismanagement and ethical concerns in the MyFlorida Alliance award including no documentation or analysis of whether the contract would actually save money, insufficient detail of requirements, and inadequate boundaries for prices and their adjustments. Most telling was the report's lambasting of the competitive bid process as essentially a sham [St. Petersburg Times, 2004]. Perhaps worse was Bahrami was hired that September by Bearing Point, the very company she helped obtain state contracts. Bearing Point claimed that there was nothing improper about Bahrami's hiring as she was never offered the job while working for the state and she was located in Virginia with no responsibility for any State of Florida contract. The Virginia appointment was viewed by some critics as a blatant attempt to avoid possible state ethics law prosecution concerning state employees obtaining jobs with previously supervised vendors [viz., S 112.3185 (c) (d) Florida Statutes] by locating Bahrami outside Florida [Lavelle, 2004; St, Petersburg Times, 2004].

Regardless, there was significant media and Legislative outrage as, whether reality or not, there was a clear implication of a *quid pro quo* relationship between Bahrami and BearingPoint.

Bahrami's new job and the report had major implications for Florida's IT operations. The STO would cancel the MyFlorida Alliance contract in September 2004 [Welsh, 2005]. More broadly, it fueled legislative concern with Bush's privatization efforts as at best poorly supervised and at worst politically awarded insider contracting at taxpayer expense. Leading the legislative outrage was State Senator Nancy Argenziano as chair of the Governmental Oversight and Productivity Committee. Argenziano, a Republican, was not the typical unquestioning supporter of Bush policies. She aggressively challenged Bush's privatization efforts much to Bush's anger and attempted political retribution. In the 2005 legislative session, Argenziano sponsored a bill that would have eliminated the STO and other changes that essentially required agencies, not a centralized STO, to build internal control processes for technology investments. The bill essentially turned much of the monetary and policy control over technology investments to the Legislature [Hanson, 2005]. Not surprisingly, Bush vetoed the bill.

The Legislative reaction to the veto was swift and decisive; the Legislature removed the STO from the annual budget, effectively dissolving the agency. The STO battle and other contractual oversight wars would lead to a very embittered relationship between and Argenziano and Bush, a then lame duck Governor, so much so that in August 2006, Argenziano commented, "I'm tired of good Republicans being bashed simply because they disagreed with him (Bush). Someone needs to smack down King Jeb"; [Democratic Underground, 2006] as well as claiming Bush "prefers dictatorship to democracy." That same year, Argenziano denounced Bush's contracting: "The governor has a history reflecting accommodation of special interests as evidenced by his agencies' contracts" [Cotterell, 2006].

One bill that did pass established the Council for Efficient Government (CoEG) within DMS (Sections 287.0571-286.0574 F.S.) to oversee contracting taking much of the power away from the Governor's office. While Bush had created a similar unit under the Governor's office in early 2004 ("Governor's Center for Efficient Government") in response to the contractual issues, the CoEG gave far more supervision to the Legislature and formalized contract oversight. State agencies would be required to submit detailed business cases for outsourcing contracts over $1 million annually to the CoEG, the Governor, and Legislature. Projects over $10 million would require analysis from the CoEG with the same oversight requirements.

The primary intent of the CoEG was to reduce risks associated with outsourcing. Besides evaluating business cases, CoEG was charged with developing "best practices" for such evaluations and annually reporting on each agency's outsourcing efforts. By 2008, the state's policy analysis unit, the Office of Program Policy Analysis and Government Accountability (OPPAGA), deemed that the CoEG had made significant progress though noted concerns that there was not a review of existing exemptions from competitive bidding and some data collection issues [OPPAGA, 2008b].

The Legislature was not done. In 2007, the Agency for Enterprise Information Technology (AEIT) was created within the Executive Office of the Governor. The AEIT was charged with development and implementation of enterprise information technology (IT) standards, monitoring their delivery, recommending to the Legislature services for enterprise level management, establishing policies for developing project management teams and risk management as well as independent project monitoring, and developing a strategic enterprise technology plan with recommendations for efficient delivery and improving the efficiency of government services via enterprise technology. The AEIT's major effort, still in its founding stages, is a massive state data center consolidation inspired by Gartner report, authorized by the Legislature in 2007, estimating a

savings between $93–$104 million [Gartner, 2008]. The AEIT expects also expects to be charged with some level of responsibility for originating and oversight of interagency projects (though not currently a significant part of their work).

The new requirements for project management via both the CoEG and AEIT has lead to agencies, such as the Department of Highway Safety and Motor Vehicles, establishing formal project management offices. Further, the changes greatly empowered the Legislature's Technology Review Workgroup (TRW). The TRW was created in 1997 to provide analysis and recommendations regarding agency IT funding as well as oversight on complex projects. As contractual power and oversight has shifted from an almost carte blanche Governor's control to the Legislature either directly or via statutory requirements, TRW's recommendations are quite critical to Legislative budgetary approval for planned contracts. Arguably, under the Bush administration, TRW had in reality little oversight of large-scale IT projects due to the Legislature's initial willingness to defer to the Governor and the STO. Now, the TRW requirements necessitate more formalized project management for general IT projects while AEIT requires this for enterprise projects (which are defined by statute).

In January 2007, the Bush era ended as Charlie Crist, a far less conservative, pro-business Republican, assumed the governorship. Labeled by many as a populist in his political views, many of his early political actions are seen as undoing the previous eight years under Bush. For example, he removed the state's controversial touch-screen voting machines for optical ones with a paper trail. As far as IT, Crist is viewed by many high-level IT careerists as rather indifferent to technology. Of course, almost any Governor would be compared to Bush. The lack of interest has further empowered Legislative controls over IT as the Governor's office is not very engaged in IT policy making. One significant decision, however, was Crist's appointment of David Taylor as head of AEIT the state's CIO. Crist's appointment of Taylor is highly significant because the CIO is no longer someone with major political connections closely tied to the Governor, but rather a career government IT manager. Taylor became CIO with over 27 years of public service and 15 years in management with significant government experience including CIO for the state's Department of Health [Hanson, 2008; MyFlorida.com, 2009]. Taylor was not a slam dunk with the selection committee as there was considerable initial resistance to the idea that a government IT manager was appropriate. But Crist is notably far more positive about government employees than Bush and the Republican controlled Legislature and Taylor's appointment signals a major change from a very political IT management to one more associated with merit and professional government expertise.

10.4 Reflections on E-Gov Management: Same Old Issues with a New Technology

One of the primary, historical tenets of public information management is that there is some difference in managing information systems in the public sector [cf. Bozeman and Bretschneider, 1986]. Fundamental issues in political involvement, personnel, and innovation have carried across various IT management efforts [cf., Bozeman and Bretscheider, 1986; Caudle, 1990; Kramer and Dedrick, 1997]. In the previous editions, these were discussed in relation to Florida's early efforts and those under the early years of Bush. Since then, Bush's major political involvement towards a private sector provision and enterprise model matured and has been largely dismantled as being either fundamentally flawed if not downright disastrous. Are the recent events from Florida any different, or do they perhaps further support previous conclusions?

10.4.1 Political Influences

Bozeman (1987) in his model of "publicness" discusses the concept of political authority flowing from the basic nature of a constitutional system where agencies' actions are controlled far more by legal factors and political cycles. The importance of politics at its many levels is a central theme in the public information management literature. The classic URBIS studies by Kraemer and colleagues [e.g., Kraemer et al., 1989; Kraemer and King, 1986] developed the concept of reinforcement politics where computing does not change the organizational power structure. Rather, the existing power structure tends to mold the use of information systems. These classic studies have been challenged in recent years, however, as changes in technology may create more decentralizing forces [e.g., Innes, 1988]. Fountain [2001], via an institutionalism lens, finds that e-gov is associated with dramatic structural changes, yet such changes are clearly part of the political game.

Florida's pre-Bush Web experience (1993–1998) strongly denotes the role of politics, especially with the rather public fight between DMS and DOS over e-gov control. From an institutional perspective, the very nature of the state's divided executive branch formed the basis of divisions and competition. The perception of political gain from a Web presence was a significant, if not the primary, factor in development.

Such top political involvement in Web operations is at odds with much of the public information management literature where elected political leaders are rarely engaged [cf. Danziger, et al., 1982]. Why the difference? A likely explanation is the technology itself. The old URBIS studies centered on highly invisible core applications like financial management. The Web, however, is far more "sexy," politically.

There is little doubt that high-level political involvement continued under Bush; witness Jeb Bush's desire to be known as the "e-governor." But, unlike Chiles, Bush was quite personally involved. Arguably, much of the confusion and disjointed policy in his first two years was created by a poor understanding and willingness to use Florida's existing capacities, far too much borrowing from private sector e-commerce models, and staff not willing to confront and disagree with the Governor, especially concerning the largely failed online permit project, and simply poor appointments (e.g., Cales). Also noticeably absent was competition. The competition between DOS and DMS did produce some healthy results. Under Bush, central leadership was clear.

But such strong, centralized political control had a price: poor contractual oversight at the very least, political favoritism at the expense of the state at worst. Years ago, Bozeman and Bretschneider [1986] warned of the dangers of high-level political involvement in IT. The Bush administration efforts are a great testament to their warnings. Does the Bush administration experience suggest that centralized IT control is bad? Not necessarily. Many of the problems concerned contractual oversight and the lack of IT expertise. At the least, centralized control still requires oversight.

One could argue the political reaction to Bush has been toward a far too decentralized model. Yes, CoEG and AEIT provide centralized oversight, but primarily their jobs are to oversee contracting and enterprise IT respectively with a focus on cost savings, like the data center consolidation project. Though agencies must develop formalized project management now, they are left mostly on their own to propose and manage IT projects. This is a significant change from the Bush administration that preferred centralized project selection via the STO (though never really realized in full). The lack of centralized project development means that Florida may find developing inter-agency applications, which many IT pundits argue provide the greatest opportunities for effectiveness gains, poorly supported. However, it should be noted that there is an expectation AEIT will assume some role in originating and organizing interagency projects, perhaps beyond enterprise technologies. The AEIT is nascent and its exact role in Florida's IT management future is in flux.

Another pitfall of heavy political involvement in management control is too much dependency on election cycles and other political factors. As Bozeman and Bretschneider [1986] warned in their prescriptions for public information management: "political executives," understandable concern with political cycles and quick results can undermine the long-term managerial objectives" [p. 484].

Florida's transition to Bush is a classic example of this problem. The state had run its e-gov operation primarily via the personality of DMS Secretary Lindner, the political interest of the DOS Secretary Mortham, a small university unit for development assistance, and a loose association of state Web developers—many not actually in IT units. Bush virtually ignored all previous work, and what structure the state had was largely decimated in his first year. Projects like the online permits were no doubt politically conceived but unrealistic in scope, poorly funded, and badly timed.

Chiles was just as politically motivated as Bush. The difference for Bush was that the Web was maturing. Leading applications were no longer simple sites. Chiles left little in professional structure. The Bush administration institutionalized e-gov starting with the formation of the STO and his preferred, very private sector, centralized structures reflected his political views. We predicted in the previous edition of this chapter that Bush's structures, due primarily to contractual obligations, would be more stable and unlikely to change [Coursey and Killingsworth, 2005]. We were absolutely wrong. Most of Bush's e-gov era management structures have been abolished as well as his centralized administration, dependent on private sector guidance and provision.

Perhaps the greatest lesson from Florida over both administrations is that top political involvement does matter. When involvement is quite general and highly strategic, leaving tactical decisions to capable professionals, political input is conducive. Such was the case under Chiles and now, it appears, Crist. However, when top political leadership insists on detailed, personal direction without reasonable resources or planning, failure is the norm. Transitions, as Bozeman and Bretschneider [1986] note, are extremely difficult, especially with major differences in political philosophy.

Florida also demonstrates that political involvement appears to influence institutions far more than the reverse. Chiles, a Democrat, preferred in-house, mostly government-based solutions. Bush preferred the private sector with centralized policy control. Crist is far more hands-off and defers to experienced government IT professionals, new oversight units, and the Legislature as the pendulum has swung to decentralized management sans contractual oversight and data centers. E-gov is quite malleable.

Arguably, the development of strong institutions, as e-gov matures and melds into existing IT operations, may lessen the political maneuvers [cf. Fountain, 2001]. Established e-gov institutions could well shape the political discourse. Politics affects IT choices, but IT possibilities influence policy-making. One vital research question is how this relationship varies over technological maturity. As the e-gov era matures, and stable structures develop, will the dualism diminish? So far, the answer is no; Florida has, and continues to be, quite unstable in its e-gov management structures. Political institutions such as the Governor and Legislature have been far more influential on IT management than the e-gov era is on political discourse. This reflects the findings as far back as the 1970s URBIS studies that political players shape IT management to support their existing roles and power more so than IT changes existing power arrangements [Kraemer and King, 1986; Kramer, et al., 1989].

10.4.2 Personnel Issues

One of the greatest alleged differences between public and private information management is the ability to attract and retain top personnel due to often dramatic salary differences and inflexible

hiring procedures of civil service systems [e.g., Bretscheider, 1990; Bozeman and Bretscheider, 1986]. Public agencies often develop IT workers from other professions and job lines in their agencies rather than directly hiring computing professionals. Supplementing information systems expertise with outside vendors is also common, but the issue of outsourcing is fraught with management issues [Globerman and Vining, 1996] and there is even some evidence that it discourages the much-needed development of internal capacity [e.g., Norris and Kraemer, 1996].

Florida, under Chiles, avoided the usual personnel problems. The DMS certainly had little problem attracting a top Web staff despite salary difficulties, Of course, DMS Secretary Linder made such a staff a budgetary priority, but the DMS case is instructive beyond executive leadership. Linder targeted younger employees where disparity in salaries was lower and offered them much greater work challenges and freedom that they would likely have found in a lower-level business operation. DMS turnover, despite the qualification and uniqueness of its Web team, was surprisingly low, owing to the often expressed high levels of job satisfaction and outright loyalty to Lindner [cf. Perez, 1997]. Such loyalty, however, has its costs, as the defection of many of Lindner's primary team with his departure from office attests.

Unlike Chiles, Bush did not believe in a government-centered model. His initial decisions to outsource the state Web portal away from DMS and virtually ignore input from state Web workers were highly demoralizing. Bush's major mistake was not to address the perception from staff that he was rather naïve about e-gov. He did not acknowledge previous work, he did not seek input, and he selected highly unqualified management and companies, at least in the view of many state Web personnel.

Bush planned for STO employees to be privatized via such arrangements as MyFlorida Alliance. Major support applications, like personnel, underwent privatization with systems like People First. Simply put, state workers were not involved in major application development and planning. Bush viewed the private sector as far more innovative and likely to have better ideas than state government.

The personnel problem for Bush was that, especially at the agency level, there was not much incentive to work in IT. Under Chiles, e-gov was seen by employees as a valuable career strategy and agencies were encouraged to develop applications. Such opportunities helped mitigate pay differences. Though pay differences between the state and the private sector have diminished with a poor economy, such a temporary reprieve from financial pressures will not last.

It could be argued that transitioning state workers, and those likely to work on state applications as new hires, would be better paid and treated in the private companies. MyFlorida Alliance potentially allowed public workers to tackle government and private work within the same organization. The advantage could be greater personnel stability as the private sector work would help support salaries. Larger companies, like Accenture and BearingPoint, might have had better potential career paths and mobility. Such benefits are possible but IT privatization efforts can also reduce pay as technology substitutes for professional personnel, a common problem in help desk type conversions.

It is likely, however, that new employees (outside of those transferred from government) would not have a good public sector background. Unlike agencies, the private companies may be far less likely to hire employees with government training. Traditionally, many government IT people start in government then learn IT. In the private sector, the reverse is far more likely. Does this mean the private sector companies are staffed with employees with little ability to understand the complexities of government and perhaps incorrectly assume business school models? Or, will companies recognize this and seek employees with government backgrounds? Large companies accustomed to government work may be more understanding, but the evidence with BearingPoint is not supportive.

Bush's strategy was to have such companies do "day-to-day" operations and leave more policy control within his administration. Arguably, this diminishes the potential problems. Bush believed staff and support functions were privatization targets, leaving government agencies to their core mission, an almost politics-administration dichotomy. But, even routine operations can involve government complexity, and implementation is hardly removed from policy.

Of course, Bush's major MyFlorida Alliance effort was abandoned, though systems like People First remain. Under Crist, and starting with the Legislature's reaction to Bush's contractual problems, there is far more reliance and trust in professional government IT personnel. Taylor's appointment as AEIT is a marked change to a CIO with government IT management experience as opposed to a politically connected CIO with sparse IT or even government management expertise. Further, agency efforts to build internalized formal project management offices signal a significant change back to IT control by government professionals, far more akin to IT administration under Chiles. This development could produce more rewarding career paths for public IT employees than existed under Bush.

10.4.3 Innovation

There is a sizable debate over the causes of information system innovation—whether demand push or technology pull is the greatest factor, and, indeed, how innovative public agencies are in relation to the private sector [e.g., Bugler and Bretschneider, 1993; Caudle, 1990; Stevens et al., 1990; Pandey and Bretschneider, 1997]. The general perception is that the public sector should be less innovative than business for reasons mostly related to expectations of public-sector red tape, fewer resources, and economic factors. However, Bretschneider [1990] has found that public managers tend to rely more on the proximity to "state of the art" in evaluating adoption of new technology over such factors as economic criteria like return on investment more favored by private managers.

Florida's early Web presence defies the usual presumption of public sector tardiness in adopting new technologies. Florida government clearly developed strong Web capabilities long before many comparable Florida businesses (at least in terms of size). Florida's experience has been mirrored at other government levels as the earliest websites were predominately government. Why? Bretschneider's study offers an important, plausible explanation.

The perceived political value associated with demonstrating cutting-edge Web technology became a critical factor in early adoption in Florida. Few novel technologies required such high political payout for such a low investment. Meanwhile, businesses waited until a larger user community developed to support e-commerce. Private Web development hinged more on return on investment, while government focused on political return. Bretscheider's [1990] explanation for why state of the art is so important to public managers do not, however, consider the importance of such political motivations.

Florida's innovation lead dramatically dropped under Bush's first two years. Why? The necessary investment and professional expertise to remain state of the art began to drastically rise with e-gov maturity about the time Bush took office. Launching a simple Web site was no longer front page news. Bush tackled very ambitious ideas, like the permit project, without the necessary supporting infrastructure. His private sector strategy was poorly timed as, in 1999, there were still not many firms with good e-gov backgrounds to employ.

Today, it is far easier to find qualified private firms for e-gov assistance. Arguably, it is almost a necessity at some level as the needed expertise, personnel, and other capacity is difficult for many governments to permanently staff. Managing and operating e-gov is far different today than in the mid-1990s.

But was the Bush model likely to foster innovation? Two of the potential weaknesses were far too much dependence on the private sector and centralization. The Bush administration stressed both out of cost concerns—the goal to make government more efficient was overriding. Yet, such centralized policy control, and external operations, may hinder innovation. A lot of Florida's initial ideas came from the agency level. Such agency applications were far less likely under Bush's arrangements. Separating mission from support work (with such IT support going to the private sector) presumes innovation has little, if any, relation to daily experience.

Now, under Crist with much of the Bush IT doctrine dismissed, what can Florida expect? Like the Bush model, the state is mostly focused on cost reduction efforts as opposed to IT as an investment per se (a long debated issue: Does one treat IT as an administrative or investment cost?), which is a reaction to Bush's contracting as well as a severely stressed state budget. Also, the state has essentially decentralized the origination of projects and most of their management. What is centralized is accountability for such projects in terms of contracting and insuring professional project management whether thru AEIT, CoEG, or TRW.

While legal and policy changes essentially make agencies develop more formalized project management structures, there is little capability now or emphasis for interagency projects, the type most IT pundits argue often hold the greatest promise for effectiveness gains. In short, accountability and professionalism in contract and project management are the key stress points, now, while under Bush there was far more of an emphasis on quite innovative, complex interagency applications with major organizational implications (though also primarily justified on cost reductions).

So, what are the implications for innovation? Florida has a mixed experience with decentralization and centralization in IT innovation. Arguments could be made that either the Chiles or Bush model was best at least at developing ideas. The Bush administration, however, suffered significant implementation problems with its privatization focus. What exists now is sort of a hybrid. Project origination and management is viewed as the responsibility of individual agencies, while there is centralized oversight of contractual arrangements and professional project management. Only time will tell the results of this arrangement and, indeed, whether it is further centralized at least in terms of interagency projects.

One notable change in the Crist era is a retreat from "state of the art" as a leading explanation for e-gov related IT adoptions. While there are political reasons for developing applications on the "bleeding edge," as we have noted in previous editions, those reasons have greatly dissipated. First, e-gov related projects are simply not the "sexy" media attention-grabbing force they were. There is far less attraction by political leadership as witnessed by Crist. Second, Florida has learned from Bush the political and financial risk of "state of the art" novel large scale projects. Instead, Florida is focusing, for the time being, more on getting its proverbial house in order with improving contracting procedure, project management, and the data center consolidation efforts. Indeed, the political emphasis is first and foremost accountability and cost reductions, whereas, before, an almost cult of innovation predominated.

10.5 Lessons Learned from Florida: Summary and Conclusions

Florida's transition from before e-gov to our current era where e-gov is essentially intertwined in IT as opposed to a distinctive technology is an interesting story in political competition, dramatic transitions and varied government/private sector models, and entrepreneurial leadership. While part of the Florida story invokes common assertions about the deployment of new IT the case also challenges many traditional beliefs.

One of these is the assumption that political leadership is not very conducive to generating capacity. Most of the literature espouses the importance of system direction from more permanent, lower-level staff [e.g., Caudle et al., 1991]. In this case, top political leadership is highly involved with mixed results. Is political leadership more important than we often expect?

In previous editions, we cautioned against a resounding "yes," despite the success under Chiles out of fear of the coming Bush transition and the lack of real permanent management: "Failure by DMS and DOS to enhance, even maintain, their present Web capabilities would actually support the very fears and concerns of authors stressing the importance of middle, more permanent management …" [Coursey and Killingsworth, 2000, p. 342].

The Florida experience under Bush dramatically underscores this warning. No doubt Bush strongly supported e-gov, but the lack of a strong structural base, his flat refusal to utilize what did exist, and steadfast insistence on private sector perspectives and companies, which simply were not well developed at the time, led to a significant drop in the state's relative standing.

We noted that arrangements such as the MyFlorida Alliance lacked government controls and were too dependent on vendors, which could lead to significant failures. Our worst fears were realized. Bush's privatization efforts became national examples of how not to do e-gov IT projects. Moreover, Florida became quite dependent on outside companies for traditional, internal staff operations. The Florida Legislature had no clear, permanent committee anymore to evaluate IT policies. Massive turnover in IT qualified legislative staff gave even the existing committees little ability to seriously evaluate the Governor's policies. Related policy analysis organizations, often critical of Bush, were targets for elimination as well. Only the Auditor General remained as a credible supervisory check, and the focus of such oversight is primarily legal and not managerial, and inevitably became Bush's downfall.

Florida's experience demonstrates the difficulty in insuring accountability in a centralized management structure, especially one with high-level political involvement and privatization. Regardless of political party, it is all too easy for companies to compete via political favors rather than quality efficient service. Centralized decision-making enables vendors to reduce their costs in influencing purchasing decisions. With more top political involvement, it becomes easier to propose new systems with little, if any, input from state IT management as was learned under Bush and Bahrami.

Personnel matters were dramatically different between Chiles and Bush. Florida enjoyed great success in securing and motivating public IT staff during the early e-gov years, especially as operations were predominately in-house. A variety of approaches independent of pay created a strong internal staff. But Bush was a radical departure toward private sector control and transferring IT workers to private jobs. Recent changes rejecting much of the Bush approach has moved more towards the Chiles' model of trusting government employees to conduct IT management witnessed by a new CIO with a strong government IT background. The development of formalized project management at the agency level provides interesting career opportunities, which would have been almost unthinkable under Bush.

Finally, Florida speaks to the importance of political demand in innovation, tempered by the necessity of strong, supporting infrastructure, and perhaps political leadership leaving the tactical details to professionals. Much of Florida's early experience was political demand-pull fostered by significant interagency competition. Bush saw such agency competition as inefficient and preferred a centralized control and development environment. No doubt, Florida needed some more formal, centralized structure particularly for applications and technologies cutting across agencies. The question was would presumed cost savings and better coordination via centralization and input of private sector ideas improve innovation? Or would the lack of agency involvement and

incentives, state employee involvement, and disconnect between mission and staff lessen positive change? The answer seems to be the later. With changes including the formation of AEIT and CoEG, the elimination of the STO, the resurgence of TRW, and a new governor rather indifferent to IT, Florida enters an area where high-level IT politics are the lowest they have been since the beginning of the e-gov era under Chiles. Innovations are unlikely to be as politically driven as in the past. Questions concerning innovation, accountability, and personnel, among others, are critical to public IT management. They involve serious academic study of complex relationships between policies, institutions and politics, and outcomes. All too often, e-gov literature has been descriptive, reporting who is doing what and how well. It is time scholars focus more on how governments implement e-gov and determine why projects fail and succeed, as well as the implications of various management strategies. Florida's rich experience provides many important lessons and, yes, almost as many new questions for scholars to ponder.

Acknowledgments

The authors wish to thank several current and former State of Florida IT management personnel for information supplementing this chapter. For their protection, they remain anonymous.

References

Bozeman B. *All Organizations Are Public*, San Francisco: Jossey-Bass, 1987.

Bozeman B, Bretschneider S. Public management information systems; theory and prescription. *Public Admin Rev* 1986; 46: 475–487.

Bretschneider S. Management information systems in public and private organizations: An empirical test. *Public Admin Rev* 1990; 50(5):536–545.

Bugler D, Bretschneider S. Technology push or program pull; interest in new information technologies within public organizations. In: Bozeman B, ed. *Public Management: The State of the Art*. San Francisco: Jossey-Bass, 1993.

Caudle S. Managing information resources in state government. *Public Admin Rev* 1990: 50(5):515–524.

Cotterell, B. 'People First' outsourcing is underway. *Tallahassee Democrat*, May 5, B1, 2003a.

Cotterell, B. State's tech office to be privatized: Information technology to cost 30 percent less. *Tallahassee Democrat*, June 4, A1, 2003b.

Cotterell, B. Audit criticizes state high-tech office. *Tallahassee Democrat*, September 20, A1, 2003c.

Cotterell, B. People First's time to put up or shut up. *Tallahassee Democrat*, September 29, B1, 2003d.

Cotterell, B. State senator counters Jeb's endorsement. *Florida Capital Bureau*, August 28, 2006. Available at http://www.ccfj.net/electVillalobos.html.

Coursey, D., Killingsworth, J. Managing government web services in Florida: Issues and lessons. In: Garson, D., ed. *Handbook of Public Information Systems*. New York: Marcel Dekker, pp. 331–343, 2000.

Coursey, D., Killingsworth, J. Managing government e-government in Florida: Further lessons from transition and maturity. In: Garson, D., ed. *Handbook of Public Information Systems*. 2nd ed. New York: Marcel Dekker, pp. 335–351, 2005.

Danziger J, Dutton W, Kling R, Kraemer K. *Computers and Politics: High Technology in American Local Government*. New York: Columbia University Press, 1982.

Democratic Underground. An angry GOP legislator has words for "King Jeb." August 26, 2006. Available at http://www.democraticunderground.com/discuss/.

Fountain, J. *Building the Virtual State: Information Technology and Institutional Change*. Washington, D.C.: Brookings Institution Press, 2001.

Gartner, Inc. *State of Florida Data Center Consolidation Feasibility Study*. April 2008. Available at http://www.flsenate.gov/data/committees/senate/fpcc/FinalReport_Gartner_Data_Center_Feasibility_Study.pdf

Globerman S, Vining A. A framework for evaluating the government contracting out decision with an application to information technology. *Public Admin Rev* 1996; 56(6):577–586.

Hanson, W. Florida governor announces new CIO. *Government Technology*, March 3, 2009. Available at http://www.govtech.com/pcio/articles/569385.

Hanson, W. Update: Florida State Technology Office loses funding. *Government Technology*, June 30, 2005. Available at http://www.govtech.com/gt/articles/94503.

Innes J. Effects of data requirements on planning: case studies of environmental impact assessment and community development block grants. *Comput Environ Urban Syst* 1988; 12:77–88.

James, J. Insider may have greased state contract. *St. Petersburg Times*, March 12, 2005. Available at http://www.sptimes.com.

Kraemer K, Dedrick J. Computing and public organizations. *Journal of Public Administration, Research, and Theory* 1997; 7(1): 89–112.

Kraemer K, King J. Computing and public organizations. *Public Admin Rev* 1986; 46: 488–496.

Kraemer K, King J, Dunkle D, Lane J. *Managing Information Systems: Change and Control in Organizational Computing*. San Francisco: Jossey-Bass, 1989.

Lauer, N. First tech chief faces tough task: Roy Cales will oversee state's technology plans. In: *Tallahassee Democrat*, July 1, A1, 2001a.

Lauer, N., Bridges, T. State's tech guru resigns amid controversy: Roy Cales arrested as plans founder (sic) for consolidated technology office. *Tallahassee Democrat*, August 31, A1, 2001b.

Lauer, N. Tech companies face contribution analysis. *Tallahassee Democrat*, May 28, A1, 2002a.

Lauer, N. CIO for state's tech office named: Acting head takes on agency under fire. *Tallahassee Democrat*, June 29, p. B1, 2002b.

Lauer, N. Tech office up for grabs: Company may take over state facility. *Tallahassee Democrat*, March 16, A1, 2003a.

Lauer, N. Workers in tech office to be axed but a private company may hire some of them. *Tallahassee Democrat*, October 19, A1, 2003b.

Lauer, N. Panel: Forced vendor listing not authorized. *Tallahassee Democrat*, December 9, B1, 2003c.

Lavelle, L. BearingPoint: Why did its boss bug out? *Business Week*, November 12, 2004. Available at http://www.businessweek.com.

Morgan, L. State technology office broke law, audit finds. *Tallahassee Democrat*, May 14, 4B–5B, 2002.

MyFlorida.com. Agency for Enterprise Information Technology. Accessed March 3, 2009 at http://www.myflorida.com/agency/369.

Norris D, Kraemer K. Mainframe and PC computing in American cities: myths and realities. *Public Admin Rev* 1996; 56(6): 568–576.

Office of Program Policy Analysis and Government Accountability (OPPAGA), State of Florida. While improving, People First still lacks intended functionality, limitations increase state agency workload and costs (Report No. 06-39). OPPAGA, Tallahassee, FL, 2006.

Office of Program Policy Analysis and Government Accountability (OPPAGA), State of Florida. DMS has improved People First, but some system components are still not fully implemented (Report No. 06-39). OPPAGA, Tallahassee, FL, 2008a.

Office of Program Policy Analysis and Government Accountability (OPPAGA), State of Florida. The Legislature and Department of Management Services have taken steps to improve acquisition management (Report No. 08-43). OPPAGA, Tallahassee, FL, 2008b.

Office of Program Policy Analysis and Government Accountability (OPPAGA), State of Florida. People First assessment (Report No. 09-BF). OPPAGA, Tallahassee, FL, 2009.

Pandey S, Bretschneider S. The impact of red tape's administrative delay on public organizations; interest in new information technologies. *J Public Admin Res Theory* 1997; 7(1): 113–130.

Perez, J. Information technology innovation in the public sector: An interpretive investigation of world wide web initiatives in state agencies in Florida. Unpublished doctoral dissertation, Florida State University, 1997.

Petersen, S. *Simone Marstiller*. Government Technology, October 5, 2004. Available at http://www.govtech.com.

Rosica, J. Cales not guilty of theft: Case went forward despite lost evidence. *Tallahassee Democrat*, March 12, A1, 2003.

St. Petersburg Times (editorial). The privatization game. *St. Petersburg Times*, September 14, 2004, 12a.

State of Florida Office of the Comptroller. (2003, January 3). Audit of the State Technology Office. [Online]. Available: http://www.dbf.state.fl.us/aadir/sto_audit/sto_report_contents.html

State of Florida, State Technology Office. MyFlorida Alliance (brochure). Tallahassee, FL: State Technology Office, 2003.

Stevens J, Cahill A, Overman S. The transfer of information systems technology in state governments. *Comput Environ Urban Syst* 1990: 14: 11–23.

Tallahassee Democrat. Permit information goes online at environmental department. *Tallahassee Democrat*, March 14, A4, 2000. Welsh, W. Florida cancels MyFlorida Alliance outsourcing contracts. *Washington Technology*, 2005. Available from http://washintontechnology.com.

POLICY RESEARCH

III

Chapter 11

E-Government as a Public Management Reform: The Experience in the United States

Gregory Streib and Katherine G. Willoughby

CONTENTS

11.1 Introduction

There is now an in-depth literature that chronicles the successes and disappointments that e-government efforts have produced. No researchers have provided a systematic analysis to date, but negative appraisals of e-government progress are certainly common. As they say about the month of March, e-government came in like a lion and "left" like a lamb. The Internet itself is amazing, of course, and it may well be one of the most significant public/private partnerships in history [Rainey and Bozeman 2000], but translating e-government technology into improved governance has been difficult. Research in the local government context illustrates the problem. As of 2002, nearly 90% of general purpose governments had Web sites, but at this same time, few local governments were reporting positive e-government results [Norris and Moon 2005]. This kind of experience appears to be a global phenomenon as even innovative governments around the world are struggling to make meaningful use of e-government applications [United Nations 2005].

This chapter takes the position that many arguments about e-government progress suffer from a lack of context. E-Government is essentially a new capacity. The advantages and disadvantages produced by e-government are more visible when viewed within the broader context of public management reforms. The first step in this analysis will be identification of key concepts that can provide a foundation for evaluating e-government use in the states, as revealed by the 2008 Government Performance Project (GPP) study that graded the information management capacity of all 50 U.S. state governments. The Project measured state capacity in generating long-term state policy, collecting information in support of such policy and managing information and its access in such a way as to advance decision-making and evaluation about the results from implementing policy.

11.2 E-Government in an Applied Context

Public administration roots trace back to the progressive movement and the same forces that created (or enhanced) other professions, but it has taken a somewhat different and more convoluted path. While the professionalization of public management was vigorously advocated in earlier times [White, 1926], most who have studied this topic for the last 70 years or so have had difficulty relating public administration to other professions. Frederick Mosher [1975] identified some concerns relevant to this discussion. First, he argued that public administration stressed organized effort rather than individual autonomy. While there is a current tendency for professionals, such as medical doctors, to affiliate with larger organizations, there is certainly a higher level of tension between individuals and organizations in these cases. It is the nature of public administration activities to knit together entire organizations and/or amass the resources needed to achieve broad goals. It was Mosher's view that generalism was an integral part of the field; that is to say, public administrators valued the ability to see the big picture over specialized technical skills.

Much of the writing on e-government has focused on local governments, and there is no doubt that city managers are generalists. The Dialogue with a Profession, begun by the International City County Management Association in 1992, affirmed the nature of city manager work. This effort produced a list of competencies needed by local government managers now known as the Practices for Effective Local Government [ICMA 2009]. Technological literacy is one of these practices, and it requires managers to demonstrate and understand information technology (IT) and ensure that it is incorporated appropriately in plans to improve service delivery, information sharing, organizational communication, and citizen access. The professionalization efforts in

local governments have arguably eclipsed those in the states, but there is no reason to think that state administrators are fundamentally different from their local counterparts. Of course, public administration is a second field for many federal managers, but we do know that as their tenure advances, they tend to take an agency perspective [Wamsley and Wolf 1990].

Thus, the value of information technologies to public management can best be assessed by viewing public organizations as an integrated whole and presuming that e-government will be implemented as circumstances dictate. This is in contrast to some early e-government rhetoric suggesting the long history of public administration reform efforts will be swept aside by the vanguard of e-government. While the Internet is awe inspiring, such an outcome would be disastrous. E-Government is essentially a set of technologies that provide no basis whatsoever for effective governance. Teri Takai, Chief Information Officer for the State of California, discussed IT at a Pew Center on the States conference, "Promising Practices: Stronger Performance, Better Service," in May, 2008, stating, "The challenge isn't about technology and improving service. It's about overcoming the real and complex cultural, administrative, funding, and jurisdictional challenges, to put the interests of citizens, communities and clients ahead of everything else."* Clearly, leadership in e-government today is not solely about the technology, rather it is about how the technology is used and the results of such use. Studies that focus on e-government as a unique path to government excellence have made contributions, but focusing on e-government as a part of larger processes gives us a better understanding of e-government problems and potentials.

11.3 A Foundation for E-Government Success

The academic literature in public administration offers much to foster e-government success with enough sifting. Practice is not always at the forefront of academic thought in the field [Newland 2000]. We will cherry pick the academic literature to some extent in this discussion because the development of thought about improving public management has certainly not progressed in a linear way. We see different themes that can inform those seeking to apply e-government effectively. These themes often overlap in a range of different ways, and our approach here is to identify distinctive contributions.

11.3.1 The Public Administration Theme

There is little doubt that traditional public administration themes have benefited and/or complicated the development of e-government applications. One clear positive is the awareness that government administration must value democratic principles, themes addressed in the writings of authors such as Cleveland [1898], Gaus [1936], and White [1939]. As noted by Lynn [2001], these traditional public administration writers exhibited greater respect for citizens, values, and politics than many recent authors. These recognized concerns are essential to contemporary governments as they face a myriad of technical challenges and opportunities.

The resilience of the politics-administration dichotomy is certainly a complicating factor in the age of e-governments. Even if we follow Svara's [2001] lead and dismiss the notion that there ever was a politics-administration dichotomy, there is no denying the fact that ambiguities exist about

* See Teri Takai's presentation, "Information in Decision Making: A Report from the Frontlines" at: http://www.pewcenteronthestates.org/template_page.aspx?id=39370 (accessed on February 27, 2009).

the leadership role of public administrators at all levels of government. In the local government context, there have been intense discussions about the role of administrators and the product has been a general understanding that appointed city managers are policy actors [Nalbandian 1991; Morgan and Watson 1992]. Following the survey study of city managers and council members, Svara [1999] concluded, "There is scant evidence of any elements of dichotomy in the council-manager relationship in the large cities at the present time" [p.50]. Others have argued that city managers may be hesitant to take the initiative on controversial policy matters [Banovetz 1994]. The legacy of the politics-administration dichotomy for e-government is that highly assertive, transformative administrative leadership is unlikely to arise from the administrative ranks.

11.3.2 The Management Tools Theme

Good government was always a core public administration commitment, but the linkages to private sector management arrived more recently. Within the last 30 years, an expansive literature has developed that tracks and assesses the application of "management tools" that in large part were imported from the private sector [Poister and Streib 1994]. Strategic management became the hallmark of the public management tools perspective in many respects, offering connections between goals, performance measurement, and performance budgeting [Melkers and Willoughby 1998]. Indeed, Melkers and Willoughby found that strategic planning and performance budgeting were frequently linked by law. A performance orientation makes little sense without an effort to identify the right things to do.

Recent incarnations of strategic planning have sought a better melding of private sector strategic management with public sector responsibilities. Moore [1995], for example, sought to focus strategic management on community benefits. He advocated enhancing the fit of strategies with mission and purpose by managing outward to establish legitimacy and then managing downward to improve organizational capabilities. Goal setting in some organized form is clearly essential as governments struggled to work their way through e-government challenges.

11.3.3 The Leadership Theme

Successful use of management tools and even strategic management requires focused direction in the form of effective leadership, and this recognition has helped to spark a vibrant interest in leadership strategies that fit the public administration context. Integrative leadership, for example, focuses on actions that build and improve on organizational abilities and management systems [Ingraham and Moynihan 2001]. This type of approach can break down hierarchical barriers in organizations that already possess results-oriented structures, critical information needed to make good decisions, and an appropriate level of capacity. Integrative leadership is a tool for comprehensive change that has produced results [Moynihan and Ingraham 2004].

Shared-power relationships greatly complicate efforts to integrate public organizations [Bryson and Crosby 1992]. Svara [1994], for example, observed that power in council-manager governments is fragmented and not along the familiar lines created by the separation of powers. In his view, facilitative leadership has become an important objective of city managers. This is a collaborative form of leadership focused on the achievement of common goals. The need for collaborative leadership may be greatest in local governments, but it is the nature of hierarchical organizations to distribute both responsibility and discretion across a range of individuals. Focusing and/or changing goals require levels of cooperation well beyond the status quo.

Research on collaboration shows that high levels of trust [Guffey 2003] and integrity [Whitaker, Henderson, and Altman-Sauer 2004] are needed to assure mutual accountability. Collaborative efforts reaching across boundaries only succeed if they empower all participants [Guffey 2006]. Intensive communication from top leadership is also essential [Trahant 2007]. These findings are important because e-government mixes awkwardly with existing hierarchies. Shareable information is often located at operational levels that could enhance Web pages controlled at higher levels in the organization. Thus, e-government requires integrative channels within organizations not provided by traditional hierarchies [Ho 2002]. Organizations need substantial pulling at the top and active involvement down to the very bottom.

11.3.4 The New Public Management Theme

While controversial, New Public Management (NPM) did give voice to public management improvement efforts. The goals of the management tools literature were essentially implicit; there were disparate management reform traditions at all levels of government and no real doctrine. The NPM put the cards on the table, leading to a new and very complex set of arguments about how government should operate. We can certainly say that the public management tools literature drew inspiration from business practices, but NPM presented business practices as a theory of governance. At its core was what Moynihan called managing for results (MFR), which focused on the management of core public services. "The MFR doctrine argues that traditional forms of public organizations perform poorly because they lack explicit standards, managers are not held accountable for achievement goals, and managers are two hamstrung by red tape to perform well in any case" [Moynihan 2006, p.77]. There is overlap between the public management tools literature and NPM on government performance, but NPM adds a call for broader management authority. As Moynihan argues, a focus on results was one half of the MFR recipe and increasing management authority was the second half.

NPM proponents also view customer satisfaction as a critical component for improved government services [Page 2005, p.713]. It is an approach that "… advocates the idea of treating citizens as clients, customers, and main beneficiaries of the operation of the public sector …" [Vigoda 2002, p.529]. Moreover, while customer service often reflects the quality of the product or service, it can also result from other factors such as responsiveness [Moon 1999, p.33]. Still, "putting the customer first," as espoused by NPM proponents, assumes flexibility of management—a flexibility that may not exist. Also, generating feedback from the bottom up is decentralizing, and this abuts a centralized leadership role necessary for setting a strategic direction for action.

There is reason to expect e-government themes and technologies to continue merging with NPM philosophies, as they both evolved to "repair" traditional public administration, which was characterized as hierarchical, slow moving, and more focused on its own internal activities than its mission, goals, or customers [Osborne and Gaebler 1992]. However, fully integrating e-government into public management processes would require intense reengineering. Accenture [2009] findings suggest that e-government matures through a series of plateaus that begin with an online presence and end with service transformation. However, e-government advancement has merged with other service improvement efforts and there are organization, process, and technology changes across agencies for all such efforts. Achieving transformation through all stages requires seamless linkages across technologies and a very skilled workforce. Such an agenda contrasts sharply with contemporary e-government in the United States, which has tended to focus in large part on providing basic information and enabling access to it [West 2004].

Apart from the sheer magnitude of the NPM/e-government agenda, there is also the concern that neither NPM nor the current iteration of e-government has done much to enhance democratic governments [Box, et al. 2002; Ciborra 2005]. Research on state governments shows a relationship between NPM innovations and the implementation of state government Web sites [Tolbert, et al. 2008], but it does not seem likely that NPM reforms will enhance what Thomas and Streib [2005] called e-democracy. The NPM model seems more akin to e-commerce and online services.

11.4 Data and Method

The GPP is supported by The Pew Charitable Trusts, Center on the States, and, according to the Center, "focuses on improving service to the public by strengthening government policy and performance."* The Project was created as a means to investigate the management capacity of governments based on the premise that management matters and a belief in the management tools theme: good management leads to good performance. Begun in 1996 and initially involving a partnership between the Maxwell School of Citizenship and Public Affairs at Syracuse University, and *Governing* magazine, a pilot project examined the management capacities of a few American cities, counties, states, and federal agencies. In 1998, the project surveyed the 50 states along with a few federal agencies; in 1999, the project examined 35 large U.S. cities. The GPP has since graded the management capacities of states in 2000, 2004, and 2007. Grades are published by *Governing* magazine and are now displayed at the Pew Center on the States Web site sometime in the spring following the year in which research is conducted and grades assigned. Thus, results from the 2008 GPP as presented here were generated in 2007.

The GPP has evolved into a collaborative effort between and among academics from various universities across the United States and journalists associated with The Pew Center on the States as well as *Governing* magazine. The 2008 project engaged teams of academics and journalists who collected and analyzed quantitative and qualitative data about the states in the management areas of budgeting and finance, human resources, infrastructure and information. The data was collected using (1) interviews of elected officials, public managers, staff, and others in every state government; (2) research collected and analyzed by university faculty and graduate students; and (3) an online questionnaire completed by state officials, administrators, analysts, and staff. The academic and journalist teams assessed the data independently to score individual criteria (strong, mid-level, or weak) that were developed to measure capacity in each management area. Criteria scores were then folded up into grades for each management area by state and then grades for each management area were folded up into an overall management grade (A, A–, B+, etc.) for each state. Following team grading, academics and journalists met and discussed each state's criteria scores and management area grades; final grades reflect agreement between the teams regarding

* The GPP is a periodic survey of state government management practices in the areas of human resources, budgeting and financial management, infrastructure and information. The project is sponsored by The Pew Charitable Trusts and conducted by The Pew Center on the States and involves both academic and journalist partners for the collection, analysis, and reporting of data. For a complete accounting of this research project, survey development, responses, and analyses of the 2008 GPP survey, go to: http://www.pewcenteronthestates.org/gpp_report_card.aspx (accessed on February 27, 2009). This paper was developed using data generated by the GPP. The views expressed here are those of the authors and do not necessarily reflect the views of the GPP or The Pew Charitable Trusts.

criteria scores as well as management area and overall grades. The GPP emphasizes that grades reflect a state's capacity in each management area rather than its performance alone.

11.4.1 GPP Criteria to Measure Information Management Capacity in the States

The criteria that measure state government information management capacity were developed by assessing best practices as promoted by relevant professional organizations, in consideration of the most current academic literature, and as evidenced to advance the efficiency and effectiveness of government programs and services. According to the GPP, the criteria, "defined by the best research in the field, established the grading standards."* Five criteria measure state information management capacity, including measures of strategic direction, budgeting and managing for performance, performance auditing and evaluation, and online services and information. States were graded not only on the information produced and its accessibility, but also on the level of integration of this information into planning, budgeting, management, and evaluation decisions. We describe each criterion below:

Criterion 1: *Government should focus on making future policy and collecting information to support that policy direction.* A high grade on this criterion required a state to have evidence of the establishment of a comprehensive (statewide) strategic direction and that agency goals and objectives feed into this long range plan. Budget requests should illustrate a coalescing of agency program direction with state policy direction. Most importantly, the state conducts multi-year IT planning that links with the state's strategic direction; such planning is relevant and useful to state decision makers across branches of government; that is, it is used by elected officials as well as agency directors, managers, and staff.

Criterion 2: *Elected officials, the state budget office, and agency personnel should have appropriate data regarding the relationship between costs and performance, and they use these data when making resource allocation decisions.* Doing well in this criterion required states to have evidence of the periodic production of cost and performance information, including comparative information. Important budget actors, including the chief executive, various budget officers, agency managers, and staff and legislators, must provide proof of the use of such information when deliberating and making decisions about the budget. High scores on this criterion indicate state success in budgeting for performance; decision makers effectively incorporate performance measurement information and cost data into their budgeting decisions.

Criterion 3: *Agency managers should have the appropriate information required to make program management decisions.* This criterion regards state IT systems and the support these systems lend to agency management. The information provided through these systems allows agency managers to link their management actions with program results. Information and its communication throughout the organization supports agency performance monitoring and advances the decision making of agency managers in seeking the most efficient and effective

* See "Grading the States 2008 Methodology" at: http://www.pewcenteronthestates.org/template_page.aspx?id=35362).

methods of carrying out programs and activities. This criterion measures how successfully states are "managing for performance."

Criterion 4: The governor and agency managers have appropriate data that enables them to assess the actual performance of policies and programs. Scoring well on this criterion requires that the state exhibit consistent processes of evaluation and auditing of the results of government activities and programs. The information produced by such evaluations and audits is verifiable and easily accessible to the public. Final reports not only track the progress of the state in reaching goals and objectives; these reports provide significant comparative data that serve as benchmarks, targets, and standards on which state progress can be assessed.

Criterion 5: The public has appropriate access to information about the state, the performance of state programs and state services, and is able to provide input to state policymakers. Scores for this criterion regard the transparency of state information as well as the level of electronic access that citizens have to state services. A state scoring well on this criterion would have provided evidence that citizens can access "key services" easily and efficiently. Furthermore, the state would be able to prove that citizens have easy access to state performance data, measures, and evaluation reports about program and activity results.

11.5 Findings

11.5.1 GPP Grades for Information Management

Table 11.1 presents the 2008 GPP grades for information management. The average grade for all 50 states is B−, with almost half of the states (22) receiving a lower grade. Just six states received a grade of A or A− (Michigan, Missouri, Utah, Virginia, Washington, and Texas). And two states received the lowest grade of D+ (New Hampshire and South Dakota).

Before we distinguish between high and low scoring states regarding information management, we will present the criteria ranked by their scores in the previous GPP conducted in 2005 and in the GPP conducted in 2008. Such a comparison provides insight into advancement or backsliding in the states across time and among the various management areas. Table 11.2 shows all management criteria, listed from highest to lowest scored criteria, by the 2008 GPP. The rank of criteria scores from the 2005 GPP are indicated. Nine criteria dropped in score from 2005 to 2008 while nine criteria scores improved, even if just slightly, during this period. Two criteria used to measure infrastructure management (intergovernmental coordination and capital planning) held steady across the two studies, maintaining first and twelfth places, respectively. It is interesting to note that of the criteria used to measure the management of information, online services and information and performance auditing and evaluation both advanced in score from 2005 to 2008. In fact, according to the GPP in 2008, "the majority of states are doing a measurably better job with Web site transactions than was the case three years ago. No state actually lost ground" [Barrett and Greene 2008, 27].

As shown in Table 11.2, states did regress in critical areas of management performance: in generating a multi-year strategic direction and the e-government related mechanisms to advance that direction. The usefulness of information to agency managers for improving performance dropped two places in the rankings while the usefulness of performance information and cost data for budgetary decision making remained almost stagnant, dropping just one place. While performance auditing and reporting in the states shows the greatest advancement by moving from 14th place

Table 11.1 2008 GPP Grades for State Information Management

Grade	*Region/State*	*Grade*	*Region/State*
A	Michigan Missouri Utah Virginia Washington	**C+**	California Idaho Illinois Montana New York North Dakota Wisconsin Wyoming
A–	Texas	**C**	Alabama Colorado Maine Massachusetts Mississippi Oklahoma Rhode Island West Virginia
B+	Georgia Iowa Louisiana	**C–**	Arkansas Hawaii New Jersey Vermont
B	Kansas Kentucky Minnesota New Mexico Pennsylvania Tennessee	**D+**	New Hampshire South Dakota
B–	Alaska Arizona Connecticut Delaware Florida Indiana Maryland Nebraska Nevada North Carolina Ohio Oregon South Carolina		

Source: Pew Charitable Trusts, 2008 Government Performance Project. Accessed February 11, 2009 at http://www.pewcenteronthestates.org/uploadedFiles/Information%20Performance.pdf

to eighth on a scale of weak to strong, strategic direction dropped back from ninth place to 16th relative to all other management criteria.

11.5.2 Comparing States with Strong or Weak Information Management Capacity

According to the GPP, state leaders in information management demonstrate creation of good information, the ability to share information, its use to manage, and as a decision tool for

Table 11.2 GPP Management Average Ranking of Criteria, 2005 and 2008

	2005 GPP Ranking	*GPP Management Criterion*	*2008 GPP Ranking*	*Advance (↑) Backslide (↓) No Change (↔)*
Strong	1	Intergovernmental Coordination	1	↔
	4	Financial Controls/Reporting	2	↑
	6	Online Services and Information	3	↑
	10	Budget Process	4	↑
	2	Internal Coordination	5	↓
	5	Long-Term Outlook	6	↓
	8	Project Monitoring	7	↑
	14	Performance Auditing and Evaluation	8	↑
	15	Retaining Employees	9	↑
	3	Contracting/Purchasing	10	↓
	18	Structural Balance	11	↑
	12	Capital Planning	12	↔
	17	Managing Employee Performance	13	↑
	7	Hiring	14	↓
	13	Managing for Performance	15	↓
	9	Strategic Direction	16	↓
	16	Budgeting for Performance	17	↓
	11	Training and Development	18	↓
	20	Maintenance	19	↑
Weak	19	Strategic Workforce Planning	20	↓

budgeting.* Michigan is one of five states that received the highest grade, "A," for information management from the GPP. This state maintains an integrated approach to the use of information and measurement in order to advance and track government performance. The state is strongly goal oriented—data tracking state performance toward goals is available online and even conspicuously posted in the halls of government to keep managers, staff, and citizens aware of the state's progress toward long-term objectives. It is significant that major technology projects are linked to individual agencies and to both statewide IT plans and the Cabinet Action Plan (CAP).†

In Michigan, the CAP serves as a transparent foundation for state achievement. The plan establishes a statewide vision and articulates shared values that will drive management toward goals that are mapped to priority areas. The CAP sets a tone for the state that holds government employees accountable to the public by calling on citizens to be vigilant regarding the progress or backsliding of its programs and services. In addition, performance measurement data is infused

* Unless otherwise noted, information presented and quoted materials in this section are taken from the "Web guide" for each state as provided by the GPP for:
California: http://www.pewcenteronthestates.org/uploadedFiles/PEW_WebGuides_CA.pdf
Michigan: http://www.pewcenteronthestates.org/uploadedFiles/PEW_WebGuides_MI.pdf
South Dakota: http://www.pewcenteronthestates.org/uploadedFiles/PEW_WebGuides_SD.pdf

† To view the most recent Cabinet Action Plan of the State of Michigan, go to: http://www.michigan.gov/cabinetplan.

throughout government; information is updated frequently and is available in multiple formats and places. Also, data requirements and use span the executive and legislative branches; in the budgeting process, both the governor and the legislature expect agencies "to justify the existence and the funding level for programs using detailed cost and performance information." Finally, the state has developed a nationally recognized performance audit system.

Michigan has worked to pull together a disparate, clunky and confusing IT system into one that, today, serves as a guidepost to other states. Beginning with a statewide IT strategic plan, Michigan has built a comprehensive system of information communication and management promoting consistent standards, infrastructure, project management, uniform rated services and unified enterprise security. Much of the success of this state's information management has resulted from focused leadership by the governor and allowances to Michigan's Department of Information Technology (MDIT) to carry out an explicit mission: "executive orders provided MDIT with an exceptionally broad mission and authority."[*] Then MDIT Director, Teri Takai, centralized state IT into one department that now services 19 agencies and over 1,700 employees. Additionally, the state has employed a strategy of encouraging fluid communication and linkages between the state and citizens, vendors, and local and other state governments. This helps MDIT to understand agency information needs, citizen demands, vendor capacity, and to leverage with other governments to guide action toward government priorities as mapped in the CAP. In fact, "IT personnel participate in all phases of Michigan's business planning process, all of which focus on delivering services to constituents."

In addition to the excellent performance information available electronically to citizens, Michigan's online connections with the public are substantial. The state's Web site is easy to navigate and a broad range of transactions can be conducted online efficiently. Michigan's online presence makes use of "social computing technology such as blogs, surveys, RS feeds, and video streaming to engage and inform citizens."

South Dakota received a D+ in information management from the GPP. In many ways, this grade recognizes the lack of information management, rather than serving as an indictment of those processes that are in place. For example, South Dakota does not have a statewide strategic plan, though the chief executive has expressed long-term goals in a few policy areas. In addition, strategic plans of agencies are eclectic; some are detailed and some are not. Some agency plans tie into the governor's goals and others do not, and some are peppered with performance data, while others lack such data. The state does not conduct any performance auditing. While agencies coordinate performance data with goals in the budget, according to the GPP, "it is not clear if [the data] is used effectively in the budgeting process." Also, while some agencies provided examples regarding the usefulness of performance information in managing programs and services, such application is not universal throughout state agencies and functions. Finally, South Dakota's online presence was cited as "relatively weak." "Simple searches for information often fail to produce results matching the query, instead bringing up random legislation." While the state offers citizens the ability to conduct some services online, "the majority of state transactions must be completed by mail-in form or in person."

Comparison of Michigan and South Dakota regarding information management offers starkly different pictures of organizing and communicating information as well and different levels of commitment to using technology to provide comprehensive services. Michigan undertook a 10-year effort to modernize its management of information and technology and is now reaping the rewards; South Dakota has not pursued such a path and perhaps sees little benefit to its citizens from such an

[*] Takai presentation, "Information in Decision Making: A Report from the Frontlines."

overhaul. A comparison with a state that committed to information and IT management and then scored much worse on the 2008 GPP may better illustrate the nature of Michigan's success.

California received a C+ for information management from the GPP in 2008 despite considerable strengths. The state possesses a strong performance evaluation and auditing component, for example, and the state's Web presence is exemplary. California also offers citizens an impressive facility for online transactions. However, the state's failings illustrate the perils of technology development that can outpace management capacity. The entire information management system was stymied by a lack of focus, fragmented management and infrastructure failures. Numerous (130) chief information officers and approximately 10,000 IT staff throughout state government managed information in a project specific manner; there was no overall strategic direction to guide action.

Surprisingly, in a state that dwarfs South Dakota in population and budget (California's population is 45 times that of South Dakota, and its 2010 estimated general fund expenditures are 80 times the size of South Dakota's), similar information management outcomes were produced. According to the GPP, "the use of performance information by agencies varies but overall is insubstantial." To date, "California produces minimal performance-based results or measures unless federally mandated, and there is no statewide system for reporting or tracking performance data." Teri Takai, recruited from Michigan to California in 2007 as the state's Chief Information Officer (CIO) views her job as a "catalyst for change."* She emphasized the need for gubernatorial direction, legislative support, and agency allegiance to a consolidated approach to information management in California.

According to the GPP, at the time of the study, there had been "a lack of coordination among agencies in developing the IT infrastructure." As the California CIO is now a cabinet level position, Takai emphasizes that her role is to bring agencies together to "build shared services," while the state must ensure a "robust IT infrastructure." Her view is that IT can be "transformational" with a focus on both "innovation and adaptation." She explains that her role as CIO is to transform service by enhancing relationships externally (as Moore 1995 advocates), and so to focus on "partner management" rather than ruling like an "information czar." According to Takai, "command and control doesn't fit anymore."†

11.6 Discussion and Conclusion

The initial goal of this chapter has been to look at e-government from a public management context in an effort to gain a better vantage point for viewing e-government accomplishments and prospects. In contrast, some previous authors have portrayed e-government as a distinct specialty or as a largely independent transformational force. Negative attitudes about government may ignite an interest in revolutionary changes, but displacing the many varied reform efforts already unfolding would probably not be either desirable or easy to do. Looking across a range of themes in the academic literature and the data generated by the GPP reveals that e-government has expanded capacity and some new tools have surfaced, but the pace of change is essentially incremental, with concurrent advancement and backsliding among various components.

The GPP findings are consistent with a view that a public administration generalist orientation is the main driver for e-government development and that the focus is on improving government performance and citizen services using an array of different management tools and processes. The fluctuations in the ratings between 2005 and 2008 suggest a continual retuning and a determined

* Takai presentation, "Information in Decision Making: A Report from the Frontlines."
† Takai presentation, "Information in Decision Making: A Report from the Frontlines."

effort to make improvements as needed and where possible. A strong private sector orientation is evident as the tools and processes in use emphasize a focus on goals, centralized control, and gathering performance information from a range of indicators. Integration and collaboration are essential to success, as are tools such as strategic management.

On the other hand, these results indicate that not all efforts are successful. Nearly half of the states received a "C+" or lower grade in information management and core e-management related processes (budgeting for performance, strategic direction, and managing for performance) actually lagged across years—considerably so in the case of strategic direction. The greatest success in information management among the states regards online services and information. These results portray technology as a catalyst for management success. That is, appropriate technology must be in place for management to flourish. Still, overall high quality information management requires multi-level leadership, a consolidated approach, a strategic direction and sustained partnerships both internal and external to government in addition to "robust" technology.

The GPP findings do follow a pattern identified in the management tools literature. That is, specific tasks and calculations, like performance auditing and evaluation, can be mastered, but integration intensive activities like the application of system-wide or department-wide performance measures, establishing a strategic direction, and a results-oriented approach to budgeting push governments to the furthest limits of their capacities. Unfortunately, these are the very tasks that relate most closely to more advanced e-government applications. Even seemingly simple tasks like providing information can require a great deal of integration. There is the raw, basic data as well as the thoughtfully presented narrative that citizens really want and need. Information presented repeatedly, in different venues and formats, paves the way for meaningful communication with citizens.

It would be easy to say that e-government is a new innovation and that progress is being made. Such a statement is essentially true, but it hides the fact that the real source of the trouble has been around for some time. Strategic planning, performance measurement, and performance budgeting have relatively deep roots in the management tools literature, and concerns about achieving a high level of connectedness between political decisions, administration, and citizens go back to the founding of public administration. The weaknesses speak to some very fundamental issues.

Moynihan argued that states failed to follow through on the NPM principles associated with managing for results by not placing responsibilities with managers who also had the latitude needed to perform. Likewise, sophisticated management applications require managers willing and able to act decisively. If we are not yet there, then questions remain about the role of public administrators in our political system, their training, and the kinds of relationships that exist with elected officials. These are both old and new challenges. Public administration in the United States has argued about these core issues since the founding of the field; more recently, NPM ideas present a contract of sorts concerning political and administrative roles and responsibilities.

If we think of e-government as a stepping-stone to a higher level of performance, we might also add that we are stepping in a very dim light, possibly into the fog. The good news is that we have the means to do better. Studies such as the GPP certainly help to provide some clarity concerning advancements as well as retreats. We need both a clearer understanding of the challenges we face and greater resolve to keep making progress.

References

Accenture. 2009. E-government leadership: Engaging the customer. http://www.accenture.com/xdoc/en/newsroom/epresskit/egovernment/egov_epress.pdf (accessed February 15, 2009)

Banovetz, J. M. 1974. City managers: will they reject policy leadership? *Public Productivity & Management Review* 17: 313–24.

Barrett, K. and R. Greene. Grading the states: The mandate to measure. http://www.governing.com/GPP/2008/index.htm (accessed February 15, 2009)

Box, R. C., Marshall, G. S., Reed, B. J. and C. M. Reed. 2001. New public management and substantive democracy. *Public Administration Review* 61: 608–619.

Bryson, J. M. and B. C. Crosby. 1992. *Leadership for the common good: Tackling public problems in a shared-power world*. San Francisco: Jossey-Bass Publishers.

Newland, C. A. 2000. The public administration review and ongoing struggles for connectedness. *Public Administration Review* 60: 20–38.

Ciborra, C. 2005. Interpreting e-government and development: Efficiency, transparency or governance at a distance? *Information Technology & People* 18: 260–279.

Cleveland, F.A. 1898. *Growth of democracy in the United States: Or the evolution of popular cooperation in government and its results*. Chicago: Quadrangle Press.

Gaus, J. M. 1936. The responsibility of public administration. In *The frontiers of public administration,* ed. J. M. Gaus, L. D. White and M. E. Dimock, 26–44. Chicago: University of Chicago Press.

Guffey, M. K. 2003. Collaborative networks: The initial design strongly influences the outcome: A practitioner-academic offers a model for how (and how not) to establish an effective network structure from four case studies at the state and local level in Arkansas. *The Public Manager* 32: 42.

Guffey, M. K. 2006. Empowering collaborations in the hollow state. *International Journal of Public Administration* 29: 561–75.

Ho, A. 2002. Reinventing local governments and the e-government initiative. *Public Administration Review* 62: 434–44.

Ingraham, P. W., and D. P. Moynihan. 2001. Beyond measurement: Managing for results in state government, ed D. Forsythe, 309–335. In *Quicker, better, cheaper? Managing performance in American government*. Albany, NY: Rockefeller Institute Press.

ICMA. 2009. Practices for effective local government management. http://www.icma.org/main/bc.asp?ssid1=2495&ssid3=2495&from=search&hsid=11&bcid=120&t=0 (accessed February 15, 2009)

Lynn Jr., L. E. 2001. The myth of the bureaucratic paradigm: What traditional public administration really stood for. *Public Administration Review* 61: 144–60.

Melkers, J. and K. G. Willoughby. 1998. The state of the states: Performance-based budgeting requirements in 47 out of 50. *Public Administration Review* 58: 66–73.

Moon, M. J. 1999. The pursuit of managerial entrepreneurship: Does organization matter? *Public Administration Review* 59: 31–43.

Moore, M. H. 1995. *Creating public value: Strategic management in government.* Cambridge: Harvard University Press.

Morgan, D. R. and S. S. Watson. 1992. Policy leadership in council-manager cities: Comparing mayor and manager. *Public Administration Review* 52: 438–46.

Mosher, F. C., ed. 1975. *American public administration: Past, present, future*. Tuscaloosa: University of Alabama Press.

Moynihan, D. P. and P. W. Ingraham. 2004. Integrative leadership in the public sector a model of performance-information use. *Administration and Society* 36: 427–53.

Moynihan, D. P., 2006. Managing for results in state governments: Evaluating a decade of reform. *Public Administration Review* 66: 77–89.

Nalbandian, J. Professionalism in local government: *Transformations in the roles, responsibilities, and values of city managers*. San Francisco: Jossey-Bass Publishers, 1991.

Newland, C. A. 2000. The public administration review and ongoing struggles for connectedness. *Public Administration Review* 60: 20–38.

Norris, D. F. and M. J. Moon. 2005. Advancing e-government at the grassroots: Tortoise or hare? *Public Administration Review* 65: 64–75.

Osborne, D. and T. Gaebler. 1992. *Reinventing government: How the entrepreneurial spirit is transforming the public sector*. Reading, MA: Addison-Wesley Publishing.

Page, S. 2005. What's new about the new public management? Administrative change in the human services. *Public Administration Review* 65: 713–27.

Poister,. H. and G. Streib. 1994. Municipal management tools from 1976 to 1993: An overview and update. *Public Productivity & Management Review* 18: 115–25.

Rainey, H. G. and B. Bozeman. 2000. Comparing public and private organizations: Empirical research and the power of the a priori. *Journal of Public Administration Research & Theory* 10: 447– 469.

Selden, S. C., Ingraham, P. W. and W. Jacobson. 2001. Human resource practices in state government: Findings from a national survey. *Public Administration Review* 61: 598–607.

Svara, J. H. 1994. *Facilitative leadership in local government: Lessons from successful mayors and chairpersons*. San Francisco: Jossey-Bass Publishers.

Svara, J. H. 1999. The shifting boundary between elected officials and city managers in large council-manager cities. *Public Administration Review* 59: 44–53.

Svara, J. H. 2001. The myth of the dichotomy: Complementarity of politics and administration in the past and future of public administration. *Public Administration Review* 61: 176–83.

Thomas, J. C., and G. Streib. 2005. E-Democracy, e-commerce, and e-research: Examining the electronic ties between citizens and governments. *Administration and Society* 37: 259–280.

Tolbert, C. J., Mossberger, K., and R. McNeal. 2008. Institutions, policy innovation, and e-government in the American states. *Public Administration Review* 68: 549–563.

Trahant, B. 2007. Debunking five myths concerning employee engagement: A recent report debunks the myths and reveals practices for enhancing individual employee effectiveness to improve organizational performance. *The Public Manager* 36: 53.

United Nations. 2005. Global e-government readiness report 2005: Towards access for opportunity. United Nations, Department for Economic and Social Affairs, Division for Public Administration and Development Management.

Vigoda, E. 2002. From responsiveness to collaboration: Governance, citizens, and the next generation of public administration. *Public Administration Review* 62: 527–540.

Wamsley, G. L. and J. Wolf. 1990. *Refounding public administration: Modern paradoxes, postmodern challenges*. Newbury Park: Sage Publications.

West D. M. 2004. E-Government and the transformation of service delivery and citizen attitudes. *Public Administration Review* 64:15–27.

Whitaker, G. P., L. Altman-Sauer, and M. Henderson. 2004. Mutual accountability between governments and nonprofits moving beyond "surveillance" to "service." *American Review of Public Administration* 34: 115–33.

White, L. D. 1926. *Introduction to the Study of Public Administration*. New York: Macmillan.

White, L. D. 1939. *Introduction to the Study of Public Administration*. New York: Macmillan.

Chapter 12

An Assessment of the Value of County Web Sites in New York State

Ed Downey

CONTENTS

12.1 Introduction

The chapter argues that it is useful to look at the intended value of government Web sites. Two areas each of economic and political value are considered. The two economic value categories are economizing on transaction costs and increasing aggregate demand. The two political categories are improving government efficiencies and testing value definitions. County Web sites in New York State are assessed to determine how they intend to add value in these four categories.

This chapter has two broad objectives. First, to provide guidance to practitioners responsible for developing government Web sites. Secondly, to develop a more complete understanding of the forces affecting government Web site development and thus inform research on the topic.

These objectives are approached by proposing a theoretical and practical value framework to help practitioners and academics understand government Web site content in terms of market and political value. It is intended that such a framework will be especially relevant to decisions that affect Web site content development.

Fifty-seven New York State county Web sites were reviewed to determine the kinds of market and political value they provide. The study examines how market and political value is created and explores the association of value with county population, budget, and median income. A literature review, an explanation of the value framework, the study methodology, findings, and conclusions are presented.

12.1.1 The Importance of County Web Sites and Their Content

For many Americans, Internet use has become a part of their daily lives. The Pew Internet & American Life Project found that 70% of American adult internet users used the Internet on an average day. Furthermore, 60% sent or read an e-mail, 49% used a search engine, and 39% used the Internet to get news [2008].

Not only is the Internet used extensively, but it is used to make important decisions. In another Pew study on searches and problem solving, respondents to a phone survey were asked "whether they had encountered 10 possible problems in the previous two years, all of which had a potential connection to the government or government-provided information. Those who had dealt with the problems were asked where they went for help and the Internet topped the list…" [Estabrook, Witt, and Rainie, 2007]. Fifty-eight percent of respondents who had experienced one of the problems (e.g., a serious illness, school problem, taxes, changing jobs, or starting a business, etc.) indicated that they had used the Internet to get help.* Not surprisingly, one of the conclusions of the study was that, "the vast majority of Americans want and expect information about government programs to be available on the Internet."

* Fifty-three percent turned to a professional, 45% sought out friends, 36% consulted newspapers and magazines, 34% directly contacted a government office, 16% consulted television and radio, and 13% went to the public library (multiple responses were accepted from individual respondents).

Given the reliance on the internet for problem solving activities, county government Web site content is important to governments who seek to provide value to constituents by meeting expectations and needs. The 57 New York State counties that were a part of the study described here all had Web sites. This alone tends to support the Pew study conclusion that Americans expect a government Web presence.

12.1.2 The Current Approach to Considering Government Web Sites

Our current understanding of government Web sites is largely conditioned by a developmental, theoretical approach suggesting that they can be placed on a continuum from simple, less integrated, and less useful forms to complex, more integrated, and more useful forms. This is typified by West's [2004, 2004a] typology which has four stages of government Web site transformation: (1) the billboard stage; (2) the partial-service-delivery stage; (3) the portal stage, with fully executable and integrated service delivery; and (4) interactive democracy with public out-reach and accountability enhancing features. Other theorists have adopted this approach [Moon, 2002; UN & ASPA, 2001; Layne and Lee, 2001] which implies that reaching the final stage is an important goal and a determining force behind government Web site initiatives. While there is some disagreement as to what the final stage is, the vision seems to be an interface that is highly integrated in ways that maximize user convenience to the extent that a government Web site will become a "one-stop service center" [Ho, 2002].

12.1.3 Difficulties with the Current Approach

The implication that integrated, more developed government Web sites are better or more valuable requires critical consideration. Rather than, or in addition to, focusing on stages of development, government Web site initiatives benefit from paying direct attention to market and political value enhancement [Downey, 2008]. Evaluating government Web sites in terms of the market and politically derived value provides at least two advantages. First, it is consistent with the emerging emphasis on stakeholder needs and value in the e-government literature [Welch, 2005; Tan, 2005; Grant, 2005; Savoie, 2004; Schware, 2003; Reffat, 2005]. Secondly, it is consistent with the practical concerns of public managers who may have to justify government Web site initiatives in terms of their value and consequent costs [Coursey and Norris, 2008].

The changes that will take place in government Web sites in the near future will be better explained and made more predictable by considerations that focus on market and political value enhancement with less emphasis on the staged development classifications used in the past.

12.2 Evaluating the Value of Municipal Web Sites

This section examines market and political value. Market value is conceived both in terms of the ease with which markets work and as proprietary value production. This suggests two market value categories. The first is economizing on the cost of legally mandated exchanges between individuals or businesses and county government by making these transactions on a Web site. The second is growing the proprietary business economies of counties (i.e., increasing the value of products and services produced in the county) through the use of a county Web site.

Political value is also conceived in two categories: improving government efficiencies and promoting civic engagement. The first category is making better use of fiscal resources through savings

from the use of Web sites. The second is using county Web sites to tap the capabilities of citizens, institutions and other stakeholders to pursue the core values of liberal societies: individual freedom, a more genuinely participatory political system, a critical culture, and social justice [Benkler, 2006, p.8]. These views are supported in the public management and e-government literature.

12.2.1 E-Government Value in the Literature

One of the contributions of the New Public Management was the idea that public administrators can best produce value by becoming more responsive to stakeholder needs [Denhardt, 2000; Barzelay, 1998; Osborne and Gaebler, 1992; Osborne and Plastrik, 1997; Kettl, 1993; Kettl and Milward, 1996; Moe, 1994; Stillman, 1995; Goodsell, 1993; Frederickson, 1980]. This has resulted in a new or renewed interest in ideas regarding value enhancement and stakeholder sensibilities. In recent years the American Society for Public Administration's journal, *Public Administration Review*, has published collections of articles on civic engagement [Cooper, 2005]; collaborative public management [O'Leary, 2006]; and citizen participation and governance [Rethemeyer, 2007]. Certainly government Web sites hold the promise of strengthening the relationship between public administrators and stakeholders in ways that better respond to expectations and needs and thus provide market and political value.

Given this trend in the field of public management it is not surprising to find an emerging emphasis on stakeholder needs and value in the e-government literature [Tan, 2005; Schware, 2003] and the effects they have on governance and policy making [Savoie, 2004]. In a study of the deployment of e-government in developing countries Schware and Dean [2003] used five categories of value to describe e-government examples in India, Estonia, the Philippines, Mexico, and Chile:

1. *Direct citizen value*: Increased access and reduced delays, improved service delivery, and less interaction with intermediaries
2. *Social value*: Improved trust in government, increased sharing of information, monitoring of regulatory compliance, greater visibility (i.e., transparency in government decision making)
3. *Government operational value*: Improvement in current performance and in preparation for future requirements (e.g., on-time, completion rate, redundancy, network congestion flexibility)
4. *Strategic/political value*: Perceived fulfillment of organization's mission (e.g., improved public image, legislative guidelines met)
5. *Government financial value*: Benefits that impact organizational and other federal government budgets (e.g., reduced cost and steps per transaction, decreased cost of materials, reduced cost of error correction)

In this country, Welch's [2005] study showed general satisfaction among U.S. citizens with the implementation of e-government. The study also showed a relationship between use of e-government and citizen trust in government. While there was general satisfaction, in instances where:

> Individuals with government Web site experience find that government is not fulfilling their expectations about interactivity and in some cases service provision. Results indicate not only that there are direct negative effects on e-government and Web site satisfaction but that there may also be indirect negative effects on citizen trust in government [Welch, 2005].

In designing a generic framework for e-government, Grant and Chau [2005] developed what they termed Strategic Focus Areas (SFAs): Service Delivery, Citizen Empowerment, Market Enhancement & Development, and Exposure & Outreach. Each of the SFAs is further defined in terms of Key Functional Applications such as eParticipation and eDemocracy under Citizen Empowerment.

The e-government research discussed considers both market and politically derived value and is consistent with an emerging Post-New Public Management. For example, Grant and Chau's [2005] Service Delivery SFA provides market-derived value because it reduces the costs of government imposed exchanges on citizens. The Citizen Empowerment SFA provides politically derived value as it improves constituent relationships management and also searches out and tests value definitions among citizens [Grant, 2005].

The literature points to a perspective that considers market and political value when examining government Web sites. This is the conceptual backdrop for the analysis of the value in New York State county Web sites.

12.2.2 Two Kinds of Market Value

As previously mentioned, market value is defined in two sub-categories: (1) the ease with which markets work and (2) proprietary value production. Improving the ease with which markets work is viewed as decreasing transaction costs in the market [Coase, 1988, Williamson, 1995] and the cost of accessing government information to citizens. Proprietary value production is changing economic arrangements in ways that grow the local economy by attracting people and businesses to spend money in the county.

The first of the market value sub-categories is named passive market value. For passive market value, financial transactions and data access queries are both called exchanges. The exchanges considered here are those that are legally imposed on the citizen. These legally imposed exchanges are fundamentally the same whether or not they are done on county Web sites. However, Web exchanges provide more efficient ways of doing things than non-Web exchanges (e.g., pay taxes, fees, fines, obtain required forms). The term "passive" is chosen to describe this since no fundamental change in the nature of the exchange due to the introduction of Web site technologies takes place, and in most instances there are non-Web exchange alternatives. Passive market value is found in online exchanges that reduce the cost to the citizen (e.g., travel, waiting in line, and mail).

Passive market value suggests an active market sub-category. Active is used where the exchange is not legally imposed and the nature of the relationship is fundamentally changed by the introduction of Web site technology. The active market sub-category implies new business and change that is unlikely without the presence of a Web site. Market enhancement and development efforts [Grant, 2005] within a county are sub-categorized as active market value because they envision an increase in business through new customers and new relationships. Two examples of active market value found on New York State county Web sites are information to increase tourism and to encourage business creation or relocation to the county. In these instances, while brochures exist with similar information, the use of hyper-text on county sites allows for browsing capabilities with the potential for new understandings and relationships that go beyond those that may be formed with the use of printed material alone.

12.2.3 Two Kinds of Political Value

As previously mentioned, political value is conceptualized in two sub-categories. First, as making better use of county resources and secondly, tapping the resources of county residents and

institutions to pursue the core values of liberal societies [Benkler, 2006, p.8]. As with market value, political value can be sub-categorized as either passive or active. Passive political value includes government fiscal value [Schware, 2003] and refers to legally imposed exchanges with citizens, which have not fundamentally changed but have become less costly to government with the introduction of Web site technologies. The exchanges considered here are those that are legally imposed on the county. An example of this for New York State counties is the reduced costs of making property records available to citizens online rather than devoting the administrative time, space, and material costs associated with the provision of this service without online capability.

The active political value sub-category includes social value [Schware, 2003] and citizen empowerment [Grant, 2005] in so far as they search out and test value definitions among citizens. Savoie [2004] indicates that the organizational boundaries within government, as they affect policy making, fundamentally change with the arrival of e-government initiatives related to social value [Schware, 2003] and the value testing and search aspects of citizen empowerment [Grant, 2005]. These ideas are based on the paradigm shift in civic agency and democracy described by Boyte [2005] where: "The shift can be conceived as a move from seeing citizens as voters, volunteers, clients, or consumers to viewing citizens as problem solvers and co-creators of public goods."

As with market value the determination as to whether political value is sub-categorized as passive or active is related to the extent to which there is a fundamental change in the nature of the exchange due to the introduction of Web site content. An example of active political value for New York State counties is the provision of county budget data along with considerable explanation on a number of sites, which provides the information for civic engagement and the potential for change that might otherwise not have taken place.

12.2.4 Value Framework for County Web Sites

In the previous sections, four value sub-categories of market and political value were discussed: passive market and political value, and active market and political value. In this section the four sub-categories are restated and two of them are combined resulting in a total of three. Three assumptions of how the sub-categories manifest themselves in county Web sites will also be discussed.

Passive market value Web site features are those that reduce the cost of legally imposed exchanges on citizens. For county Web sites, these are financial or non-financial exchanges where the costs to citizens making the exchanges are reduced by using a county Web site. The cost reduction of the exchanges can be considered as increasing the convenience of making the exchanges to citizens and thus reducing costs (i.e., costs such as travel to a government office, waiting in a line, and using the mail).

Passive political value Web site features are those that reduce the cost of legally imposed exchanges on governments. For example, online access to property databases by citizens saves government administrative time, space, and material costs.

Passive market and political value enhancement will occur together since a value increase in one will likely find a corresponding increase in the other. A savings to citizens in travel time, waiting in line, or using mail will correspond to a savings to county governments in administrative time, space, and material costs. Legally imposed citizen-government exchanges cost less for both parties with the use of county Websites. For this reason, passive market and political value are combined into a single sub-category for the purposes of this research. The dotted line between passive market and political value illustrates this concept in Figure 12.1.

Market or Political → / Passive or Active ↓	Market Value- improved ease of transactions; proprietary value production	Political Value- better use of resources; pursue core values of liberal society
Passive- legally imposed; no fundamental change in the nature of the exchange	Passive Market Value- decrease exchange costs to citizens	Passive Political Value- increase the efficiency of government operations
Active- not legally imposed; the relationship is fundamentally changed by Web site technology	Active Market Value- improve county economy	Active Political Value- enhance civic engagement

Figure 12.1 The value framework.

Active political value is found on Web sites that provide the information needed and/or the forum for civic engagement. Terry L. Cooper of the USC Civic Engagement Initiative provides the following definition of civic engagement: "… people participating together for deliberation and collective action with an array of interests, institutions, and networks, developing civic identity, and involving people in governance processes" [2005]. Examples of civic engagement opportunities on county Web sites include such things as opportunities to interact with government officials, availability of relevant policy and program implementation information, dispute resolution, and opportunities to volunteer.

Active market value Web site content attempts to affect aggregate demand in the market of a jurisdiction to grow the economy by taking new initiatives and/or forming new relationships. For county Web sites this includes encouraging tourism, individual, and business relocation and new business creation. These aspects of county Web sites are designed to increase aggregate demand and thus grow county economies. Examples of active market value content on county Web sites include tourism, and business creation and relocation information.

The active political and active market value sub-categories are distinguished from the passive market and political category in two distinct ways. First, for the active value sub-category, exchanges are not legally imposed. Secondly, the active sub-categories create value through new relationships made possible by Web sites, while the passive sub-category creates value by reducing Web exchange costs below those for non-Web exchanges.

The value framework uncovers how county Web sites provide different kinds of value and what value site developers believe is important. While the value framework is not a predictive model, it is expected that county Web sites will conform to the three following assumptions:

1. County Web sites provide value in more than one sub-category and, in most instances, in all the sub-categories.
2. Among county Web sites it is expected that there will be some variability in the way value is provided in each of the value sub-categories.
3. County Web sites are likely to provide more aggregate value in one or perhaps two sub-categories.

The three sub-categories of value and the three assumptions described above constitute a value framework for understanding the kinds of value offered by the New York State county Web sites in this study. The framework is not intended to be normative and is descriptive rather than

prescriptive. The next section describes the data collection methodology and the sample used to measure passive market and political value, active political value, and active market value.

12.3 Methodology

The researcher used a data collection format to collect data from 57 counties in New York State. Data collection was done during the summer and fall of 2008. The following sections discuss data collection and the sample.

12.3.1 Data Collection

The data collection format is an adaptation of one from previous studies, which used graduate student observers. For this study, items in the previously used format were refined so as to reduce subjectivity and improve test validity. This was done by creating ordinal items from previous open ended responses. For example, one of the items under the active political value sub-category was: The site deals with issues directly related to sustainability. Open-ended responses were reviewed to determine a finite list of issues, which were categorized as: commodity and/or natural resource conservation, housing rehabilitation, climate change, environmental maintenance or improvement. Data was collected to provide counts of the number of issues covered on each site (0–4).

In addition to counts, other variables were ranked in terms of content functionality from lowest to highest. In each case, the lowest ranked response was "Nothing available" and the highest was some form of online interaction. For example, for government employment opportunities the functionality rankings are: (1) Nothing available; (2) Human resources (HR) contact information only; (3) HR contact information, information about working conditions, or the employment process; (4) Position listings and descriptions; (5) Online applications.

A total of 46 items were collected from each site; however, not all of them were reported in this study. Not all of the items were ordinal; for example, county population and median income were collected from the U.S. Bureau of the Census, and budget information was collected from the county sites or via phone interview. In order to improve reliability, the researcher reviewed all the sites more than once and also asked others to review one or more sites for purposes of comparison. Where there was disagreement the researcher reviewed the site to make a final determination.

12.3.2 Value Measures Used

For the passive market and political value sub-category, all items were coded in terms of functionality. Following is a list of the items:

1. Government employment opportunities
2. Vendor/contractor opportunities
3. Bill/fine payment (products, taxes, other)
4. Information requests from citizens (tax records, court records, sex offender addresses)
5. Permit/license application

For the active political sub-category, items were measured by a functionality ranking (described above) or counts of the number of issues covered. The items with an indication of whether ranks or counts were used follow:

1. Available contact with county officials (ranks)
2. Availability of budget information (ranks)
3. Access to audits and/or program evaluations (counts)
4. Use this site to resolve disputes (rank)
5. Availability of volunteer opportunities (rank)
6. Site deals with issues directly related to sustainability (counts)

For the active market value category items counts were used for all the items:

1. Encourages tourism with attractions
2. Encourages tourism with amenities
3. Encourages individual relocation with living environment
4. Encourages individual relocation with services
5. Encourages business creation/relocation

Minor changes in the scales were implemented during the study, which required that site reviews be re-done on several occasions. This was done in the interests of making the format more sensitive to some of the unique features of county sites and the intent of the value format. For example, in some cases, county sites had a budget online in the county legislature's page without an explanation. At first, this was classified as a budget without explanation; however, if a county administrator's annual message that discussed the budget was then found, this was re-classified to a budget with explanation. In this case, it was determined that the value format should be sensitive to whether or not the information existed on the site rather than how convenient it was to find.

12.3.3 The Sample

New York State has 62 counties, five of which are contiguous with the boroughs of the City of New York. The Web sites for the five boroughs are not distinguishable from the New York City site, and it was determined to exclude them from the analysis. The primary reasons for selecting New York state counties were researcher familiarity and county diversity. Evidence of county economic and demographic diversity is presented in the discussion that follows.

The 57 counties in the sample have a median population of 81,916 (2004 estimated, http://www.epodunk.com/), a median county budget of $138.8 million, and a median income $37,272 (2000 census, U.S. Census Bureau). There is considerable variability in these numbers and in the physical realities in the counties. The smallest county is Hamilton, population 5,227; county budget, $15.5 million, and median income of $32,287. The county is in the Adirondack Park region, in the northern part of the state, and its economy relies heavily on tourism and logging. The next smallest county is Schuyler, population 19,505, county budget $41.2 million, and median income of $36,010. Schuyler is in the southern tier at the bottom of Seneca Lake, where agriculture, especially wine making, and tourism play a large role in the local economy.

The largest counties are Suffolk and Nassau, which are on Long Island, near New York City. These counties have populations of 1.5 and 1.3 million; county budgets of $1.6 and $2.7 billion; and median incomes of $65,288 and $70,020, respectively. The counties have diverse economies, which are largely driven by their proximity to the City of New York. Cayuga and Clinton counties are at the sample median in terms of population with 81,916 and 81,875 respectively. They have county budgets of $138 and $147 million and median incomes of $37,487 and $37,028. Cayuga is located in the western part of the state north of Schuyler and contains the Cayuga Lake wine

region as well as Cornell University and Ithaca College. Clinton is located in the northeast corner of the state on Lake Champlain and the Canadian and Vermont borders. Within Clinton County there is a State College and the former Plattsburgh Air Force Base, which is being redeveloped for commercial use.

While there is considerable economic and demographic diversity, that diversity is not normally distributed. Measures for skewness for population, county budget, and median income are positive at 2.95, 3.21, and 1.94, respectively. Kolmogorov-Smirnov results on these variables indicate that they are not normally distributed. For this reason, it was determined to use non-parametric tests (gamma) to determine how population, county budget, and median income are associated with the market and political value measures discussed in the previous section.

12.4 Study Findings

The data are presented in three sections. Passive market and political value is discussed first. As discussed earlier, these two forms of value most often occur together, because a transaction that takes place on a county Web site is likely to increase both passive market and political value by reducing costs for both citizens and county governments.

Unlike passive market and political value, active market and political value are more likely to be independent and are discussed separately. The second section presents data on how active political value is created by county Web sites by looking at the extent to which they promote civic engagement. The third section presents data on the active market value created on county Web sites by looking at ways that the sites try to increase aggregate demand to improve county economies. Each of the sections includes an analysis of the association between the value of site content and county population, budget, and median income.

12.4.1 Passive Market and Political Value

Table 12.1 shows the number and percentage of county sites that offered online exchanges at the highest functional level in five areas. It also shows the number of sites that provided no exchange or information of any kind for those areas. The contrast between those sites that provide passive market

Table 12.1 Online Capability versus No Capability or Information

	Online Exchanges		*Nothing Available*	
Item	*Web sites*	*%*	*Web sites*	*%*
Records requests	37	64.9	3	5.3
Vendor bids	16	28.1	12	21.1
Payment of taxes, fees	8	14.0	16	28.1
County job applications	3	5.3	1	1.8
Permit, certificate applications[a]	2	3.5	11	19.3

Note: N = 57

[a] Does not include drivers' licenses which are done on a state run Web site even though counties run the local offices

Table 12.2 Most Frequent Option Offered

	Item Options		
Item	*Web sites*	*%*	*Description*
County job openings	53	93.0	Position listings and descriptions
Records requests	37	65.0	Online database queries
Payment of taxes, fees	31	54.4	Information on how to make payments
Permit, certificate applications	23	40.4	Information on where to apply
Vendor bids	16	28.1	Online bid submission system

Note: N = 57

and political Value through the highest functional online exchanges and those that provide nothing shows variability in the value provided among county sites.

Table 12.2 shows the functionality option that was most prevalent among the 57 county Web sites for passive market and political value. For the items of county job applications and payment of taxes or fees, a majority of the sites generally provided information but no online capabilities to fill out employment forms or make online tax or fee payments. For the permit/certification applications item, no single functionality option was evident for the majority of the sites; however, information on where to apply (in most cases, the county clerk's office) was the most common option. The most frequent online exchanges with the highest functionality were records requests and vendor bids.

Table 12.3 shows the option for each item that was least prevalent among the 57 county Web sites. The least frequent option offered ranged from eight sites that offered online payment of taxes/fees to one site that had nothing available for county job applications.

The data provides some insight into the kind of passive market and political value that is available on county Web sites. Of the five items, position listings and descriptions for county job applications and online transactions for record requests represent the most frequent passive market and political value available. These two items were closely followed by information on payment of taxes, fees, and information on where to apply for permits and certificates.

Given the growth in e-commerce[*] it is interesting to see that only 14% of county sites offered online payment of taxes or fees while almost 65% of the sites offered the highest functionality for online record requests. The online record requests were in most cases for sex offender, property tax, and/or geographic information system (GIS) information. Sex offender information for all counties is provided by the New York State Division of Criminal Justice Services Web site at:

[*] The advent of e-commerce has demonstrated the market value of commercial Web sites. The U.S. Census Bureau reports adjusted third quarter e-commerce sales at $34.4 billion, 3.4% of total sales (2008). While there is no corresponding Census Bureau data on the value of e-government transactions, there is an emerging understanding of these phenomena and their value [Chen and Thurmaier, 2008]. According to TNS Media Intelligence, "Internet display advertising continued its growth leadership, increasing 15.9 percent in 2007 to $11.31 billion in expenditures [2008]." Once again, there is no corresponding data for the value of display advertising on, or linked to, county or any government Web sites. However, the current research has uncovered a considerable presence of New York State county Web site display add like content designed to attract business to counties.

Table 12.3 Least Frequent Option Offered

	Item Options		
Item	*Web sites*	*%*	*Description*
Payment of taxes, fees	8	14.0	Online
Records requests	3	5.3	Nothing available
Permit, certificate applications	2	3.5	Online
Vendor bids	12/12	21.1	Nothing available/ Contact info. only[a]
County job applications	1	1.8	Nothing available

Note: N = 57

[a] The choices of Nothing available and Contact information only were tied for the lowest position with 12 sites each.

http://criminaljustice.state.ny.us/nsor/search_index.htm and many counties simply linked to this site, which allows various kinds of searches.

Property tax data is important to local government and school districts that rely heavily on the tax. In 2007, the New York State Office of Real Property Services established the Centralized Property Tax Administration Program. This made grants available to counties to study and implement county databases for the property tax. The program spurred the implementation of online tax databases that were developed by third party software vendors for counties.

New York State provides technical assistance, coordination, and information for GIS systems through the Office of Cyber Security and Critical Infrastructure Coordination. While the state does not directly fund county GIS, the strategic plan for the office (2008) indicates that there is considerable interaction among state, county, and municipal governments in New York. These interactions promote GIS content in county sites.

A third online transaction is vendor bids. Sixteen counties allowed for vendor bids online and twelve had no information for vendors (see Table 12.1). In most instances where vendors could bid online, the site where bids were submitted was run by a third-party consortium of governments. Considerable variability among the 57 county Web sites was found in the area of vendor bids. Table 12.4 shows the almost even distribution of sites among the four functionality options.

A gamma of .644 (approx. sig. = .000) was obtained for the relation between the level of vendor bid interactivity in site content and county population in quartiles, suggesting that the larger a county's population is the more likely it is to have more vendor bid functionality in its site content. A similar, though weaker relationship was found between vendor bid functionality content and the size of the county budget in quartiles with a gamma of .566 (approx. sig. = .000). Because the size of the budget is related to the size of population, this is expected and tends to confirm the conclusion that larger counties have more vendor bid functionality in site content.

Table 12.4 Level of Vendor Bid Functionality

Functionality	*Web Sites*	*%*
Nothing available	12	21.05%
Contact information only	12	21.05%
Downloadable RFP or listserv	17	29.82%
Online bids	16	28.07%

In New York State, the counties with larger populations also tend to have higher median incomes* and we would expect a positive gamma between median income and vendor bid interactivity. This expectation is realized with a gamma of .600 (approx. sig. = .000). Larger county population, budget, and median income are associated with higher levels of vendor bid functionality on county Web sites.

Sites also provided passive market and political value by making information and forms available online. Specifically, these are county job applications and notices, information on how to pay tax bills and other fees, and permit and certificate applications. In all instances, this information is available on the county site via an internal link (usually to a county department page such as the County Clerk). Having this information online saves citizen time in retrieving information and forms and county time in processing requests.

Passive market and political value exists on New York county Web sites both as a result of available online database searches, transactions, and information and forms that are made available online for legally imposed exchanges. In the case of the highest functional online exchanges there are three trends. First, records requests are handled largely by the state (i.e., sex offender database) or in part supported by state funding to counties (i.e., property tax database and some GIS). E-commerce, like transactions to pay online for tax bills or for fees for services, are not as much in evidence as the database capabilities. Second, the highest functional online exchanges are generally done via external links to another government or private entity—the State for sex offender data and private third parties for property tax data, GIS, and vendor transactions. Third, much of the passive market and political value that is provided on county sites is via internal links and in the form of lower functionality exchanges which include information and forms that are made available online.

12.4.2 Active Political Value

Table 12.5 shows six items that enhance civic engagement resulting in active political value enhancement. These include contact with county officials, budget information, volunteer opportunities, dispute resolution, sustainability, audits and program evaluations. The table suggests little variability among sites for contact with county officials, but some in the other functional areas.

Facilitating contact with county officials is fundamental to civic engagement, and 56 counties provided directory information or an online contact feature. Twenty of the 56 county sites (35.09% of all 57 counties) had online contact, and five of these sites offered blogs. In all instances, the blogs were relatively inactive and primarily used as a vehicle for county press releases and announcements. Of 37 sites that did not offer online contact, 36 provided some form of directory with addresses, phone numbers, and/or email addresses of county officials. Only one site did not provide contact information for county officials.

Budget information is also important for civic engagement. Thirteen county sites (22.8%) provided no budget information, and 44 sites (77.2%) made budget information available. The quality of the information varied from sites that offered a budget without any explanation to sites that provided considerable explanation. Table 12.6 provides a qualitative breakdown of budget explanations.

---

* R Square values were obtained for the following equations: Cubic- .471; Power- .425, Quadratic- .424, and Linear- .413, where the independent variable was county population (U.S. Census Bureau estimate for 2004) and the dependent was median income (U.S. Census Bureau estimate for 2007). All R Squares are significant at .000.

Table 12.5 Active Political Value Online Presence versus No Presence

	Feature is Available		*Minimal or No Feature Availability*	
Item	*Web Sites*	*%*	*Web Sites*	*%*
Contact w/ county officials	56	98.3	1	1.8
Budget information	44	77.2	13	22.8
Volunteerism	42	73.7	15	26.3
Dispute resolution	21	36.8	36	63.2
Sustainability	14[a]	24.6	7	12.3
6 or more audits and/or program evaluations	10	17.5	41[b]	71.9

Note: N = 57

[a] 3 to 4 sustainability issues included in content
[b] 1 or 0 reports

Budgets, alone, are not as useful as budgets with explanation in helping citizens understand county priorities. With explanation, budgets become a potentially valuable tool for those who wish to be involved in civic engagement, and 24 sites (42% of all county sites) did provide some degree of budget explanation. The variability in Table 12.6 is, in part, explained by county differences in population, budget, and median income.

A gamma of .478 (approx. sig. = .000) was obtained for the relation between the level of budget explanation in site content and county population in quartiles, suggesting that the larger a county's population is the more likely it is to have more budget explanation site content. A similar and stronger relationship was found between budget explanation content and the size of the county budget in quartiles with a gamma of .510 (approx. sig. = .001). Because the size of the budget is related to the size of population, this is expected and tends to confirm the conclusion that larger counties have more budget explanation site content.

As already mentioned, larger counties in New York also tend to have higher median incomes, and we would expect a positive gamma between median income and the level of budget explanation. This expectation is realized with a gamma of .405 (approx. sig. = .004). Larger county population, budget, and median income are associated with higher levels of budget explanation content (i.e., higher functionality) on county Web sites.

Volunteer opportunities were available on 42 sites; however, only 3 of the 42 sites allowed users to apply online, the highest level of functionality. In most instances, county wide volunteer

Table 12.6 Level of Explanation Provided with the Budget

Explanation of Budget	*Web sites*	*%*
No budget information	13	22.8
Budget w/ no explanation	20	35.1
Budget w/ some explanation	16	28.1
Budget w/ considerable explanation	8	14.0

Note: N = 57

information was not available in a single place. Sixteen of the 42 sites offering volunteer opportunities had some form of county wide volunteer capability (information or some online applications). Twenty-six sites had volunteer information spread throughout various county department pages (e.g., Departments of Aging, Youth, Social Services, and Fire Departments).

Dispute resolution information or online requests, options were available on 21 sites (see Table 12.5). Seventeen of these sites provided contact information specifically for dispute settlement and four offered specific, high functionality, online dispute settlement capabilities in the form of mailto complaint forms that could be submitted by the user. Thirty-six sites offered no dispute settlement information or online capability; however, as already noted, 20 sites offered general online contact and 36 sites offered directory information for county officials. Even though that online contact or contact information was not specifically for dispute settlement purposes it can be used to make a complaint to a public official.

Sustainability issues and programs for local governance go hand in hand with civic engagement (Cooper, 2005; Portney, 2005). The study reviewed county Web site content to determine how many sustainability issues were included in site content. Table 12.7 shows variability in the distribution of the number of sustainability issues covered by county Web sites.

This variability may be related to county demographic and economic differences. A gamma of .473 (approx. sig. = .001) was obtained for the relation between the number of sustainability issues in site content and county population in quartiles, suggesting that the larger a county's population is the more likely it is to have more sustainability issues in its site content. A similar, though not as strong, relationship was found between sustainability content and the size of the county budget in quartiles, with a gamma of .413 (approx. sig. = .008). Because the size of the budget is related to the size of the populations, this is expected and tends to confirm the conclusion that larger counties have more sustainability issues in site content.

Again, as previously mentioned, larger counties in New York also tend to have higher median incomes and we would expect a positive gamma between median income and sustainability content. This expectation is realized with a gamma of .344 (approx. sig. = .029). Larger county population, budget, and median income are associated with higher levels of sustainability content on county Web sites.

Few audit or program evaluation reports were available on county sites. As Table 12.5 shows, 41 sites offered two or fewer audit or program evaluation reports, and 10 sites offered 6 or more reports. The remaining six sites offered between two and five reports.

Civic engagement requires relevant information and a forum where engagement can take place. In general active political value is enhanced by county sites to the extent that they provide information; however, the sites do not provide forums. As noted, only five sites offered blogs which

Table 12.7 Sustainability Issues Content

Number of issues[a]	*Web Sites*	%
0-1	25	43.9
2	18	31.6
3	7	12.3
4	7	12.3

Note: N = 57

[a] commodity and/or natural resource conservation, housing rehabilitation, climate change, environmental maintenance or improvement

were inactive. In terms of the information required for civic engagement, there is value available from contact information or capability with county officials, budget information, and opportunities for volunteering. There is also some content available on dispute resolution and sustainability issues. There is less value from the availability of online audit or program evaluation information. For the two items with the most variability (budget explanation and sustainability issues) demographic and economic variables were positively associated.

12.4.3 Active Market Value

Table 12.8 shows the number and percentage of county sites that offered maximum content for five items. It also shows the number of sites that provided no or minimal content for the items.

All of the items are ranked by four categories of counts. Table 12.9 shows the ranking for the item labeled "encourages individual relocation with living environment." Note that the lowest rank is 0 or 1 and the highest is 4 content areas.

For the business creation or relocation item, there were five rather than four content areas collapsed into four ranks. As a result, Table 12.10 shows the highest rank as four or five rather than just four, as is the case with the other variables.

The rather even distribution among the ranks in Table 12.9 prompted an analysis to determine if there were associations with population, county budget, and median income. A gamma of .486 (approx. sig. = .000) was obtained for the relation between the number of living environment issues in site content and county population in quartiles, suggesting that the larger a county's population is the more likely it is to have more living environment issues in its site content. A similar,

Table 12.8 Active Market Value Maximum versus No Content

	Maximum Content		*Minimum Content*	
Item	*Web Sites*	*%*	*Web Sites*	*%*
Encourages business- creation/ relocation	36[a]	63.2	9	15.8
Encourage tourism- attractions	35	61.4	6	10.5
Encourage tourism- amenities	32	56.1	13	22.8
Encourage individual relocation- services	30	52.6	4	7.0
Encourage individual relocation- environment	15	26.3	13	22.8

Note: N = 57

[a] Content is either 4 or 5 out of 5 content areas that encourage business creation or relocation.

Table 12.9 Active Market Value Encourages Individual Relocation with Living Environment Content

Number of areas[a]	*Web Sites*	*%*
0-1	13	22.8
2	10	17.5
3	19	33.3
4	15	26.3

Note: N = 57

[a] housing, non-governmental employment, transportation, and community data or profile

Table 12.10 Active Market Value Business Creation or Relocation Content

Number of areas[a]	*Web Sites*	*%*
0-1	9	15.8
2	5	8.8
3	7	12.3
4-5	36	63.2

Note: N = 57

[a] financial incentives, site assistance, useful data, a business directory, and local business news

though not as strong relationship was found between living environment content and the size of the county budget in quartiles with a gamma of .419 (approx. sig. = .002). Because the size of the budget is related to the size of the populations, this is expected and tends to confirm the conclusion that larger counties have more living environment site content.

As previously mentioned, larger counties in New York also tend to have higher median incomes and we would expect a positive gamma between median income and living environment content. This expectation is not realized with a gamma of .275 (approx. sig. = .073), which is not significant. Larger county population, budget, but not median incomes are associated with higher levels of living environment content for individual relocation on county Web sites.

For business creation or relocation content a significant association was found with population, with a gamma of .406 (approx. sig. = .000). The gammas for county budget and county income were not significant (.298 and .193). Larger county population, but not budget, or median income is weakly associated with higher levels of business creation or relocation content. The final market value item to show some association with demographic and economic variables is individual relocation services (see Table 12.11).

The analysis for association with population and county budget produced significant gammas, which were .554 (approx. sig. = .000) and .453 (approx. sig. = .005), respectively. The gamma for median income (.276) was not significant. Larger county population and budget, but not median income, are associated with higher levels of relocation services.

Active market value can be distinguished from the other two sub-categories of value in that more of the content is linked externally (i.e., different domain) rather than internally on county sites. Table 12.12 shows each of the active market value items and how the information for each item was linked to the county sites.

Table 12.11 Individual Relocation Services

Number of Areas[a]	*Web Sites*	*%*
0-1	4	7.0%
2	8	14.0%
3	15	26.3%
4	30	52.6%

Note: N = 57

[a] education, health facilities, social services, recreation

Table 12.12 Active Market Value External versus Internal Links

	Web Site Link Status					
Item	*External Link*	*%*	*Internal Link*	*%*	*None*	*%*
Encourages business- creation/ relocation	40	70.2	13	22.81%	4	7.0
Encourage tourism- attractions	38	66.7	17	29.82%	2	3.5
Encourage tourism- amenities	38	66.7	14	24.56%	5	8.8
Encourage individual relocation- environment	26	45.6	28	49.12%	3	5.3
Encourage individual relocation- services	13	22.8	43	75.44%	1	1.8

Note: N = 57

The large majority of business creation or relocation and tourism content is provided by external links. These were Chamber of Commerce, Business Development, Industrial Development Agency, Workforce Development Agency, and Independent County Tourism Sites. Individual relocation content about the living environment in the counties was evenly distributed between external and internal links. The large majority of services content for individual relocation was offered in internal links. Service descriptions tended to be in county department pages internally linked to the county home page.

There is active market value on county sites in the form of information, designed to improve the economy of the county, and it relies heavily on external links. The exception to this is services information to encourage individual relocation that is available through internal links. As with the other two value categories, there are some positive associations with the size of the population and county budget and active market value; however, there is no significant association with median income.

12.5 Summary and Conclusions

The findings are summarized in two ways. First, an overview is provided of the most evident and least evident ways that value is enhanced by county Web site content using the value framework sub-categories of passive market and political, active political, and active market value. Second, a summary of the findings related to the effects of the size of the population, county budget, and median income on the value of the content of county Web sites is presented and discussed. At the end of this section is a discussion of how practitioners and researchers can use the value framework to systematically observe and develop county Web sites.

12.5.1 Most and Least Evident Value

Table 12.13 summarizes the study findings in terms of the value framework. The most evident passive market and political value found on county sites is information, forms, some database searches and vendor bid transactions (generally done through external links). Information on government position openings (93.0% of all sites); how to make payments of taxes and fees (54.4% of all sites);

Table 12.13 New York State County Web Site Value Summary

Value Categories	*Brief Definition*	*Most Evident*	*Least Evident*
Passive market and political	Decrease legally imposed exchanges to citizens and government	General information, forms, some database searches and vendor transactions through external links	E-commerce like online purchases (taxes, fees), online submissions of applications and forms
Active political	Increase participation in policy making through civic engagement opportunities	County official contacts, budget information with some explanation, volunteerism information	Interactive issue discussions (e.g., blogs), audit and program evaluations
Active market	Increase aggregate demand and stimulate the growth of county economies	Tourism, business creation/ relocation, individual relocation	Living environment individual relocation information is available but not on as many sites as other items

and information on where to apply for permits and certificates (40.4% of all sites) can all save the cost and time associated with phone calls by citizens and responses by county personnel. State support is evident for the most common database searches (sex offender, property tax, and GIS) and may be an enabling factor. Vendor bid transactions are in most cases a part of consortiums of municipal governments.

The least evident form of passive market and political value is e-commerce like online purchases (taxes, fees) and online submissions of applications and forms. Only eight sites, 14% of all county sites studied, allowed for online payments. Only two sites offered any kind of online permit or certificate application (3.5%), three sites (5.3%) offered online applications for county jobs, and another three sites offered online applications for volunteers.

Site content for active political value was in the form of county official contacts, budget information with some explanation, and volunteerism information. County official contacts were usually in the form of an online directory and in many cases a single document that looked like a paper directory or county office phonebook. In addition, most sites had separate pages for many county departments, and contact information was often on these. The county budget was available online for 44 sites (77.2%), and nothing was available for 13 sites (22.8%). Over half the county sites (33) studied either had no information or a budget without explanation. Regarding volunteerism 42 sites (73.7%) provided information. Civic engagement, and thus, active political value is certainly enhanced by online information that aids contact with county officials, helps citizens understand the budget, and provides volunteer options. However, the fact that half the sites provided no budget explanations tends to reduce the value in aggregate here.

The least evident form of active political value were online interactive issue discussions (e.g., blogs), and audit and program evaluations. The promotion of civic engagement requires information and also a forum. Virtually no active blogs where issues were under discussion were found on the county sites in this study. There was also a paucity of audits and program evaluations found in site content. Only ten sites (17.5%) had six or more audit and/or program evaluations available online. This suggests some insufficiency of information necessary for effective civic engagement.

Active market value was most evident in the form of the promotion of tourism, business creation or relocation, and individual relocation. Over half of the sites provided maximum content to encourage tourism with information on attractions and amenities. Tourism information was commonly found in an external link developed and maintained outside of county government. This is not to say that there was not any tourism-related content on county sites, and it was not uncommon for county sites to include pictures of county attractions and information related to tourism.

As with tourism, a considerable number of sites offered content designed to encourage business creation or relocation, and much of this content was in external links developed and maintained outside of county government. Attracting tourists and business to a county are two active market value enhancement strategies that grow the economy. Because much of the content exists on external links, county sites increase this value at very little cost in terms of having to develop and maintain county Web site content.

Another active market value enhancement strategy that grows the economy is to attract individuals to relocate into the county and over half of the sites provided services information that someone interested in relocation would find of value. Despite this, only 15 sites (26.3%) provided maximum content on the living environment to promote relocation (housing, non- governmental employment, transportation, and community data or profile). Much of the services information was naturally a part of the content on county department pages, while at least some of the living environment content (e.g., non-governmental employment) was not.

The first assumption of the value framework is that county Web sites provide value in more than one sub-category and, in most instances, in all the sub-categories. This assumption was supported by the study. New York State county sites evidenced considerable passive market and political, active political, and active market value on individual sites and in the aggregate. Of course, there was some variability among counties which is discussed in the next section.

12.5.2 County Value Variability

There is some variability in the ways New York county sites provide value. These were discussed in the findings and are summarized in Table 12.14, where the effects of population, county budget, and median income show associations with several items in each of the value categories.

For passive market and political value, significant gammas were found for vendor bid interactivity for the three variables (population, county budget, and median income). For active political value, the conclusions are that the variables are associated with higher levels of budget explanation and sustainability content. For active market value, associations with the variables are somewhat mixed and two qualified statements are made: (1) larger county population, budget, but not median income are associated with higher levels of individual relocation living environment and services content, and (2) larger county population, but not budget, or median income is more weakly associated with business creation or relocation content.

The second assumption of the value framework is that among county Web sites there will be some variability in the way value is provided in each of the value sub-categories. The value framework provides a structure for uncovering and comparing the various ways county sites provide value. In general, where there is variability among county sites, larger and wealthier counties have more functionality in some aspects of passive market and political, and active political value Web site content. This association is more complex in active market value content since population is positively associated with three items, county budget with two items, and median income is not associated with any items.

Table 12.14 Effects of Population, Budget, and Median Income

Value Categories	*Description of Item*	*Gammas for population, budget, and median income*	*Conclusion*
Passive market and political	Vendor bid interactivity	.644 .566 .6	Larger county population, budget, and median income are associated with higher levels of vendor bid interactivity.
Active political	Level of budget explanation	.478 .51 .405	Larger county population, budget, and median income are associated with higher levels of budget explanation.
	Number of sustainability issues	.473 .413 .344	Larger county population, budget, and median income are associated with higher levels of sustainability content.
Active market	Number of living environment issues	.486 .419 .275*	Larger county population, budget, but not median income are associated with higher levels of living environment content.
	Number of business creation or relocation issues	.406 .289* .193*	Larger county population, but not budget, or median income is weakly associated with higher levels of business creation or relocation content
	Number of individual relocation services	.554 .453 .276*	Larger county population and budget but not median income are associated with higher levels of relocation services

* *Gammas are not significant*

12.5.3 Conclusions: The Difference in Value Offered in the Three Categories

The third assumption of the value frame work is that county Web sites are likely to provide more aggregate value in one or perhaps two categories. Evaluating the relative value provided by the three categories is problematic in the sense that no number representing value for each category

can be assigned, an issue that may be worthy of future research. However, the application of the value framework does provide systematic observations that allow for the following value statements:

1. Larger, wealthier county sites provide more passive market and political, and active political value. This is also true for active market value for larger but not wealthier counties.
2. Active political value in terms of civic engagement is available in online information availability but not in online forums for civic discussion. The active political value offered relative to its potential is less than the other two categories.
3. Passive market and political value is less than its potential due to the general lack of e-commerce transactions and online forms. Online database queries exist that provide value and are, in part, enabled by the state.
4. Active market value is closest to its potential value. In part, this is the case because much of the value is well developed and available in external links to sites outside of county government.

In summary, New York county Web sites provide the most active market value through external links. The passive market and political category provides the second most value because of the lack of e-commerce like transactions and forms that can be filled out and submitted online. The least value is provided in the active political category due to the absence of interactive forums for civic engagement.

12.5.4 Practitioner and Researcher Utility

The value framework is proposed as a way of providing practitioners and researchers insight into Web site content. The two broad objectives of the study were (1) to provide guidance to practitioners responsible for developing government Web sites; and (2) to develop a more complete understanding of the forces affecting government Web site development and thus inform research on the topic.

As to the first objective, it is worthwhile for practitioners to ask questions such as: What kind of value does my site provide? What kind of value do citizens want from my site? How does my site's value compare to others? How can I make the site more valuable with limited resources? These are the kinds of questions that the value framework suggests and helps to answer. The framework is not prescriptive; rather it provides a disciplined way of describing Web site value that can provide a base line for the consideration of value-enhancing alternatives. The value framework is more useful to the practitioner than previous conceptualizations that suggest a deterministic movement from simple, less developed to more complex, developed sites.

From the researchers' point of view, the internet as a whole, of which Web sites are one manifestation, is a phenomenon worthy of study. Many believe that the rapid increase in the amount and availability of information has and will continue to result in profound changes, and are frustrated by the lack of intellectual tools to adequately understand what is happening. A systematic descriptive method has been employed here and associations between county Web site content and some demographic and economic variables have been uncovered. Considering the content of county Web sites using the value framework is perhaps one small step toward developing better tools to aid our understanding.

References

Barzelay, M. 1998. The new public management improving the research and policy dialogue. http://www.planejamento.gov.br/arquivos_down/seges/publicacoes/reforma/seminario/barzelay.pdf (accessed December 8, 2004).

Benkler, Yochai. 2006. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven, CT: Yale University Press.

Boyte, Harry C. 2005. Reframing democracy: Governance civic agency, and politics. *Public Administration Review* 65(3): 536–546.

Chen, Yu-Che, and Kurt Thurmaier. 2008. Advancing e-government: Financing challenges and opportunities. *Public Administration Review* 68(3): 537–563.

Coase, R. H. 1988. *The Firm, the Market, and the Law*. Chicago: University of Chicago Press.

Cooper, Terry L., ed. 2005. Articles from the Civic Engagement Initiative Conference. *Public Administration Review* 65(5): 534–623.

Coursey, David, and Donald Norris. 2008. Models of e-government are they correct: An empirical assessment. *Public Administration Review,* 68(3): 523–536.

Denhardt, Robert, B., and Janet Vinzant Denhardt. (2000). The new public service: Serving rather than steering. *Public Administration Review*, 60(6): 549–559.

Downey, Ed. A conceptual framework for considering the value of e-government. *Electronic Government Concepts Methodologies Tools and Applications*, edited by Ari-Veikko Anttiroiko, Hershey: IGI Global, 843–52, 2008.

Estabrook, Leigh, Evans Witt, and Lee Rainie. 2007. Information searches that solve problems. Report, Pew Internet & American Life Project. http://www.pewinternet.org/pdfs/ Pew_UI_LibrariesReport.pdf (accessed November 21, 2008).

Frederickson, George. 1980. *New Public Administration*. Tuscaloosa, AL: University of Alabama Press.

Garson, G. David. (Ed) 2000. *Handbook of Public Information Systems*. New York: Marcel Dekker.

Goodsell, Charles T. 1993. Reinvent government or rediscover it? *Public Administration Review*, 59(1): 85–87.

Grant, Gerald, and Derek Chau. (2005). Developing a generic framework for e-government. *Journal of Global Information Management*, Jan-March 2005 v13: 1–30.

Ho, Alfred Tat-Kei. 2002. Reinventing local governments and the e-government initiative. *Public Administration Review*, 62(4): 434–444.

Kettl, Donald F. 1993. *Sharing Power*. Washington, DC: Brookings Institution.

Kettl, Donald F., and H. Brinton Milward, ed. *The State of Public Management*. Baltimore: Johns Press, 1996.

Layne, Karen, and Jungwoo Lee. 2001. Developing fully functional e-government: A four stage model. *Government Information Quarterly*, 18(2): 122–136.

Moe, Ronald C. 1994. The "reinventing government" exercise: Misinterpreting the problem, misjudging and consequences. *Public Administration Review*, 54(2): 111–22.

Moon, M. Jae. 2002. The evolution of e-government among municipalities: Rhetoric or reality? *Public Administration Review*, 62(4): 424–434.

Office of Cyber Security and Critical Infrastructure Coordination. 2008. State of New York geographic information system (GIS) strategic plan. http://www.nysgis.state.ny.us/coordinationprogram/straplan/documents/nys_strat_plan_final.pdf (accessed January 12, 2009).

O'Leary, Rosemary, Catherine Gerard, and Lisa Blomgrin Bingham, eds. Symposium on collaborative management. *Public Administration Review*, Supplement to 66 (2006).

Osborne, David and Ted A. Gaebler. 1992. *Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector*. Reading: Addison-Wesley.

Perri 6. 2004. *E-Governance: Styles of Political Judgment in the Information Age Polity*. New York: Palgrave MacMillan.

Pew Internet & American Life Project. 2008. Daily Internet activities. http://www.pewinternet.org/trends/Daily_Internet_Activities_7.22.08.htm (accessed November 21, 2008).

Portney, Kent. 2005. Civic engagement and sustainable cities in the United States. *Public Administration Review* 65(5): 534–623.

Reffat, R. M. 2005. Developing a successful e-government. http://www.arch.usyd.edu.au/~rabee/publications_files/03Reffat_eGov.pdf (accessed October 10, 2005).

Rethemeyer, Karl L. et. al. 2007. Essays on citizen participation and governance. *Public Administration Review*, 67(2): 199–289.

Savoie, D. 2004. Searching for accountability in a government without boundaries. *Canadian Public Administration*, 47: 1–25.

Schware, R., and Arsala Deane. 2003. Deploying e-government programs: The strategic importance of "I" before "E". *Info- The Journal of Policy, Regulation and Strategy for Telecommunications*, 5(4): 10–19.

Stillman, Richard J. 1995. The refounding movement in American public administration. *Administration Theory and Praxis*, 17(1): 29–45.

Tan, Chee-Wee, Shan L.Pan, and Eric TK Lim. 2005. Managing stakeholder interests in e-government implementation: Lessons learned from a Singapore e-government project. *Journal of Global Information Management*, 13(1): 31–53.

TNS Media Intelligence. 2008. News. http://www.tns-mi.com/news/03252008.htm [accessed December 9, 2008].

United Nations and American Society for Public Administration. 2001. Global survey of e-government. http://www.unpan.org/e-government2.asp (accessed October 10, 2005).

U.S. Department of Commerce. Census Bureau. 2008. Quarterly retail e-commerce sales 3rd quarter 2008. http://www.census.gov/mrts/www/data/html/08Q3.html (accessed December 9, 2008).

Welch, Eric, W., Charles C. Hinnant, and M. Jae Moon. 2005. Linking citizen satisfaction with e-government and trust in government. *Journal of Public Administration Research and Theory*, 15(3): 371– 392.

West, Darrell, M. 2004. E-government and the transformation of service delivery and citizen attitudes. *Public Administration Review*, 64(1): 15–27.

West, D. 2004a. State and federal e-government in the United States. http://www.insidepolitics.org/egovt04us.html (accessed October 10, 2005).

Williamson, Oliver. Transaction cost economics and organization theory. *Organization Theory from Chester Barnard to the Present and Beyond*, edited by Oliver Williamson, 207–56 New York, Oxford: Oxford University Press 1995.

Chapter 13

Advancing E-Governance at the Community Level: Creating an Information Chain Reaction with Neighborhood Information Systems

Sungsoo Hwang and Mark Curtis Hoffman

CONTENTS

13.1 Introduction

A Neighborhood Information Systems (NIS) is an economic development tool powered by Web technologies, Geographical Information Systems (GIS)*, and database applications [Hwang 2006]. More specifically, NIS is a technology system that provides interactive mapping tools, combined with a conventional database system containing neighborhood-level demographics, housing, economic, and social data, to enable storage, analysis, and mapping of such data in multiple scales. In short, the information system takes conventional and spatial databases and makes data retrieval and mapping easy over the Web (see Figure 13.1).

How effective are NISs as an Information Technology (IT) tool for local governance? The IT revolution and the Internet have led public administration scholars to pay attention to influences of IT and computer technologies in management and governance. Since the 1990s, electronic government (e-government)† has been a prominent theme in the public sector, influenced by business management studies of e-commerce in the private sector [Bretschneider 1990; Kraemer and Dedrick 1997; Garson 1999; Fountain 2001; Moon 2002; Ho and Ni 2004; Kernaghan and Gunraj 2004]. Yet, discussion of IT innovation in the field of community development is still in an early stage [Kraemer et al. 1989; Huxhold 1991; Sawicki and Flynn 1996; Nunn 1999; Seedco 2002].

This chapter discusses the management of NISs to reveal how technology, policy, and governance interact to support community development.

13.2 Background

Local governments collect information that can lead to better community development decision-making, but local governments are not the only decision makers involved in community development. Nonprofit organizations, community groups, and business organizations also participate in the decision-making process. However, there is often only limited sharing of local data among various decision makers. This is because the capacity of community organizations to process and analyze data is limited, and the government's ability to disseminate data in a useful manner is limited by budget and other constraints.

To bridge this gap between government data and community stakeholders' information needs, nonprofit organizations, universities, foundations, and government agencies have started working together to develop NISs.

In the early 1980s, some communities, including Pittsburgh and Cleveland, began developing computer-based neighborhood indicators systems. However, technology advancement, particularly in Web and GIS applications in the past decade, brought tremendous growth in the number

---

* GIS is a collection of computer hardware, software, and geographic data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. A definition by Environmental Systems Research Institute, Inc. (ESRI) can be found at http://www.gis.com/whatisgis/index.html (accessed May 2006)

† The definition used in the E-Government Act of 2002 (Section 3601) is as follows:
'Electronic Government' means the use by the government of Web-based Internet applications and other information technologies, combined with processes that implement these technologies, to (A) enhance the access to and delivery of government information and services to the public, other agencies, and other government entities; or (B) bring about improvements in government operations that may include effectiveness, efficiency, service quality, or transformation.

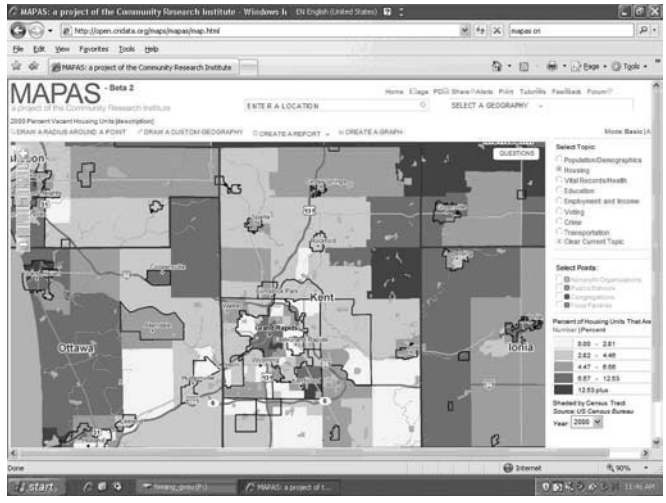


Figure 13.1 An example of NIS: Grand Rapids Community Information System. (From: http://open.cridata.org/maps/mapas, March 2009.)

and sophistication of these systems. In the early 1990s, NISs in Oakland, Boston, Providence, and Denver began distributing neighborhood socio-economic information to community-based groups. As of 2008, 30 NISs were partnered with the National Neighborhood Indicator Partnership (NNIP), an initiative by the Urban Institute.* Private and community foundations have put millions of dollars into NIPP and its constituent organizations.† These kinds of funding were invested in NNIP to diffuse knowledge of NIS development to many cities, but also some of them were invested directly to build NISs in several cities. Some project teams in several cities gained federal government funding such as Technology Opportunities Program (TOP) or municipal government grants. Several more are operating outside of NNIP, and even more are in the planning and development stage. Some of these information systems have been working with Urban Markets Initiative of the Brookings Institution.‡

Kingsley [1998] listed four factors in making NIS feasible: (1) advances in computer hardware; (2) address-matching and advances in GIS software; (3) advances in the availability of automated administrative data; and (4) advances in local institutional development. Such local institutions are called "data intermediaries" among NIS project teams.

In short, the main objective of NIS is to help local organizations develop electronically-compiled, technically sound, and content-rich indicators of a neighborhood's situation, so that

* The National Neighborhood Indicators Partnership (NNIP) is a collaborative effort by the Urban Institute and local partners to further the development and use of neighborhood-level information systems in local policy-making and community building. http://www.urban.org/nnip/about.html (accessed November 2008) NNIP Concept: In recent years all NNIP partners have built advanced information systems with integrated and recurrently updated information on neighborhood conditions in their cities. The creation of this capacity, which did not exist in any U.S. city a decade ago, represents an important technical and institutional breakthrough http://www.urban.org/nnip/concept.html (accessed November 2008)

† Annie E. Casey Foundation and Rockefeller Foundation.

‡ Urban Markets Initiative, Brookings http://www.brookings.edu/metro/umi_overview.aspx (accessed March 2009)

Community Development Corporations (CDCs), Community Based Organizations (CBOs), and residents can better plan for the revitalization of the neighborhood [Sawicki and Flynn 1996].

The development of NIS can be viewed in the context of the shift of focus in recent public administration scholarship studying a governance model. As Kettl [2002] puts it, "governance is a way of describing the links between government and its broader environment—political, social, administrative." Traditionally, nonprofits and community organizations have acted as key stakeholders in local development decision making with local governments. In moving from "e*-government" to "e-governance," scholars have seen an increase in electronic engagement and networked societal guidance increasing the role and influence of nongovernmental entities, which Kettl sees as characteristics of governance [Riley 2003; Brown 2005; Snellen 2002; Coe, Paquet, and Roy 2001; Kim 2004]. The rise of e-governance† is made possible by the advent of new technologies [Roy 2003], which can include NIS (see Table 13.1).

13.3 Theoretical Foundation

In the past decade, Public Private Partnership (PPP) has increased as a governance technique related to governing by network, decentralization, and devolution, particularly with the growth of the nonprofit sector in public administration [Kettl 2002, 1988; Salamon and Elliott 2002; Salamon 1995; Goldsmith and Eggers 2004; Pierre 1998; Riley 2003], and studying NIS can utilize this framework of "governance/e-governance."

How well do NISs contribute to local governance? First, we look at the effectiveness of NIS to answer this question. There is no consensus about what the "effectiveness of NIS" means or on how to measure it. Until the early 1990s, this was a problem with Management Information Systems (MIS) in general. Delone and McLean [1992] stated that "the dependent variable for information systems success has been an elusive one to define." In response, they introduced a comprehensive taxonomy, which posits six major categories: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. Their work has been established as a guiding taxonomy with 150 articles referencing the Delone & McLean model. Combining the Delone & McLean model with criteria suggested by Kingsley [1999], a definition of effective NISs can be as follows:

1. Sustainable: They remain available and continuously update information over time, not just for a single funding cycle.
2. Diverse and content rich data: They include more than Census data.
3. Useful: Local decision makers actually use the system to help with decision making, planning, and evaluation.

This definition is consistent with studies looking at how democratizing data leads to improvements in public policy and social changes [Weitzman, Silver, and Brazill 2006]. Improved data

* E (electronic) means digital technology that enables people transact with anyone, at any time in any place, by using the Internet and other ICTs' (Song 2002).

† E-governance vs. E-government (Riley 2003, Kim 2004): E-government constitutes the way public sector institutions use technology to conduct administration and to embrace the delivery of existing services, such as government to citizens (G2C). E-governance, however, is not simply about technological or physical application for public affairs but about the ways political and social powers are organized and used. E-governance deals with how the citizens interact with the government or influence the legislative or public sector processes.

Table 13.1 Comparing E-Government and NIS as E-Governance: Similarities and Differences

	E-Government	*Neighborhood Information System*
Domain	Public Service	Community Development
Technology	Web, database	Web, database, mapping technology (GIS)
	Succeeding Public Management Information System in parts	
Goal	Better service, cost-efficiency, effectiveness, responsiveness, public participation	Economic development, revitalization of community, neighborhood indicators, effectiveness of data sharing, public participation
Example	www.firstgov.gov DMV - Licensing Service	http://neocando.case.edu/cando/index.jsp social, economic, parcel data
	Census Data, Business Data, Some Tax data	
Key player	Government agencies	Nonprofits leading, Gov't & Univ partners
Theoretical relevance	New Public Management: Reinventing Government, Public-Private Partnership (Contracting out vs. in-house IT dept.), public participation	New Public Management: Reinventing Government, governing by network, Public-Private Partnership, University-Community Partnership, Nonprofit strategic alliance-partnership, public participation

practice should benefit local decision-making, but this expectation regarding NIS extends beyond community development organizations. NISs aim to reach those at "the top," hoping government agencies realize that better public policy will be formulated when better information is available (see Figure 13.2).

Our research builds on three overlapping streams of research. The first stream investigates how the recent advancement of information technology (IT) changed the governance. Scholars within the fields of public administration and political science have developed this stream. Some scholars [Ho 2002; Ho and Ni 2004] assert that IT can drive governments to reinvent the way they work. Governments used IT from the late 1980s to improve efficiency. With the arrival of the Internet, IT steered governments to enhance its external relationship with citizens as well [Scavo and Shi 2000; Coe, Paquet, and Roy 2001].

As an IT innovation tool, an NIS can be compared with "CitiStat*" in the sense that, for both, IT is driving the reinvention and performance of governments. Citistat began as "CompStat" of the New York City Police Department (NYPD) and was adapted by Baltimore for internal performance measurement. It has been adopted by a number of cities in the United States. Both CitiStat and NIS promote and thrive on better data practices [Henderson 2003; Behn 2006].

* CitiStat is an accountability tool based on the ComStat program pioneered in the New York City Police Department by Jack Maple. CompStat, utilizing computer pin mapping and weekly accountability sessions, helped the NYPD dramatically reduce crime and is employed today by several police departments around the world. Baltimore Mayor O'Malley is convinced that this same process can be used not only for crime, but for every City agency from Public Works to Health (http://www.ci.baltimore.md.us/news/citistat/index.html, retrieved April 2007). Citistat with a root from "CompStat" of the NYPD, is a nationally recognized innovation, which started off from Baltimore's performance strategy and adapted to a number of cities in the U.S. (Behn 2006).

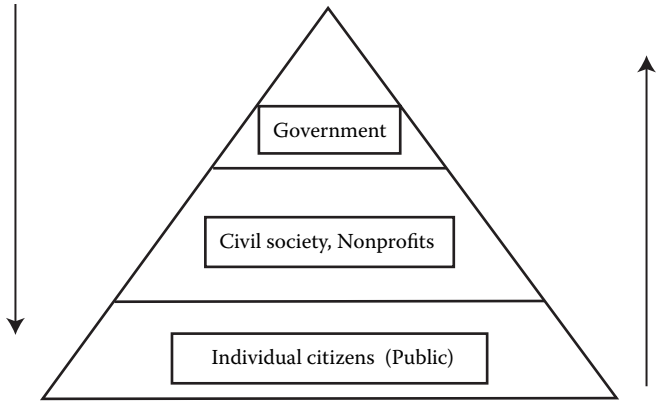


Figure 13.2 Providing better information for better public policy (top to bottom vs. bottom to top).

The CitiStat movement showed the potential IT possesses for tracking performance data. But the users of CitiStat remain within the hierarchy of traditional governments: mayors, agency heads, and managers. While NIS shares many characteristics with CitiStat, the crucial distinction is that NIS is designed to inform other local stakeholders and the general public. That is, CitiStat is a change agent operating from inside governments, while NIS is usually initiated by the civil society sector with government as a partner. For this reason, NIS is an example of how collaborative governance enables IT innovation and how IT innovation can foster collaborative governance in return.

The second stream of relevant research comes from scholars interested in Public Participation GIS (PPGIS). Ghose and Huxhold [2002] argued that GIS-based neighborhood indicator studies can assist in bridging the crucial data gap to the benefit of citizens and planners alike. A number of scholars have explored how GIS can help community organizations to do their tasks [Huxhold 1991; Craig and Elwood 1998; Ghose 2001; Sieber 2001; Elwood 2002; Kirschenbaum and Russ 2002; Pattavina, Pierce, and Saiz 2002; Policy Link and LISC 2002; Seedco 2002]. Ghose [2003], and Ghose and Elwood [2003] stress training and organizational variability in adoption and utilization of GIS in the community organizations. Ramasubramanian [2004] draws attention to the access to the data of community organizations and empowerment. Some others examine what social indicators can help neighborhood revitalization and how to implement sets of indicators with information systems for communities' access [Sawicki and Flynn 1996; Bailey 1997, 2000; Leitner et al. 1998; Pinkett 2003; Treuhaft 2006].

Treuhaft and her colleagues argue that IT (particularly Internet and GIS) helps community capacity building and enhances the relationship with local government agencies through the works of data intermediaries in so-called "data democratization"* efforts. They documented that

* As stated before, NNIP acts as a national headquarter of the majority of neighborhood information systems in the U.S. They have produced and compiled a wealth of knowledge on their publication page on their Website, http://repositories.cdlib.org/iurd/wps/WP-2006-03. They have showcased stories of cities that used NIS to facilitate community building and the local policy making process. They argue that the accomplishments of these NISs across the nation are already contributing to program and policy effectiveness, and they are also leading to broader improvements to ongoing processes of governance in some localities (The Urban Institute 1999; Kingsley and Pettit 2004; Kingsley 1998).

local data intermediaries have played important roles with harnessing the power of GIS to help community organizations. They also pointed out that the process of data democratization, which is to build data exchange and repository process, helps relationship building and trust among the local governments and the nonprofits [Treuhaft 2006; Treuhaft et al. 2007].

The third stream of research is public participation and civic engagement. Arnstein [1969] suggested that providing better access to data and knowledge would help move up the "ladder of citizen participation." Scholars [Thomas and Streib 2003; Thomas 1990] have pointed out that public decision-making often includes greater managerial and technical components, thus yielding less public involvement. Moynihan [2003] pointed out that one of the problems of the traditional public participation literature is that citizens often have a weak understanding of public problems, often as a result of not having adequate data. He provides a good example of how information technologies foster citizen input: Washington D.C.'s Citizen Summit. According to him, public managers in Washington D.C.'s Citizen Summit actively searched for techniques and technologies to reinvent public hearings for greater participation. Citizens and community groups historically have come to public meetings mostly only with anecdotes, but NIS provides a potential way to overcome this barrier, fostering a type of data and knowledge-informed dialogue that we have not seen before.

13.4 Research Questions

What makes a useful and effective NIS? We break this question down into three sub-questions:

- Better Data Access: Does NIS increase data sharing among regional stakeholders in community development?
- Usefulness: Do community stakeholders use NIS? How do they use it?
- Community Empowerment and Participation: Does NIS facilitate participatory decision-making and the empowerment of nonprofit organizations?

In fulfilling NNIP's goal of furthering the use of data through NISs in local policymaking and community building, NISs should be designed to easily enable users to better access the needed data. Determining whether an NIS is user-friendly (and actually used) is important, as is the measuring of their impact on communities and local policy. This latter item is harder to measure, but most critical.

To answer above research questions, one of the authors developed a mixed method research project that combined a qualitative case study and a statistical analysis. Data were collected through fieldwork observation, a Web-based survey, and semi-structured interviews.

13.5 Data and Methodology

The fieldwork was completed by one of the authors through his four-year role as a project team member of the Pittsburgh NIS.* The author attended a majority of the meetings of data, technology, and funding partners as well as user groups, and contributed to the project team by conducting

* Pittsburgh Neighborhood and Community Information System (http://www.pghnis.pitt.edu, accessed April 13, 2008)

benchmark studies, working on the GIS data, participating in the process of drafting a business plan, and conducting training sessions. The author conducted the face-to-face interviews with those who were involved as project team members and partners as well as users.*

The second component of this study involved conducting a survey.† A survey questionnaire was crafted based on the authors' experience and some of the existing measures from the selected literature.‡ A Web-based online survey § was utilized to ask project team members in a number of cities across the United States about their partnership experience. The survey was targeted to reach NIS users and project team members across the nation. The survey had 221 responses¶.**

The third component was to conduct interviews with project team members in an additional three NIS cities. The author visited Cleveland, Washington D.C., and Boston to meet project team members and partners to conduct an in-depth case study in an effort to compliment the

---

* Interviews were done in the fall of 2006.

† The unit of analysis in this research is an organization. Organizations are the aggregate concerns of individuals who share problems and reflect their concerns as a collection [Scott 1992]. This research includes organizations that are involved in the development of the NIS. These organizations are analyzed and compared to examine the proposed research question: probing a working partnership model. Each project team member represents his or her organization as a component of the organizations. The unit of observation for this research question is the individual project team members or other project partners at partnering organizations. Another unit of analysis is the NIS, itself, as an information system in answering the effectiveness of NIS research question: assessment of current effectiveness of the NIS. The unit of observation for this question is individual users of the NIS.

‡ Although the survey instrument relied on existing literature of IT effectiveness and utilization, there were no widely accepted scales or measures to apply to this NIS study survey. A few models, including International City/County Management Association (ICMA)'s e-government survey, were the starting points, but the development of the survey instrument heavily relied on the author's NIS project involvement experience with the input from other project team members from Pittsburgh and Grand Rapids. A pre-test was conducted on the instrument. Pittsburgh and Grand Rapids were chosen as a pre-test sample for a survey.

§ Survey data was collected from December 2006 to March 2007. The focus of the study was to compare the usage of NISs across the nation, thus online survey would better reach users of the NIS. Research shows that using a Web-based survey is expected to increase response rate from such a population who use computer and Internet in a regular basis compared to paper-and-pencil surveys (Selm and Jankowski 2006).

¶ Obtaining a viable sampling population presented a challenge. Given the size of the NIS population and the limitation of identifying user groups, a decision was made to administer the survey to entire project teams across the United States (i.e., convenience sampling). Most project teams wanted to honor privacy of their users' e-mail addresses. First, the survey was sent out to the NNIP partners and other NIS sites asking them to distribute the survey through their email lists. Second, the email (as an introductory letter) asked respondents to forward the survey to anyone who might be interested in participating. Third, the survey obtained and used email addresses from government agencies' Web sites (such as city planning and IT departments). Fourth, the researchers posted an invitation to the survey on several ListServs, including NNIP ListServ and ARNOVA ListServ. We had help from the project teams of the seven NIS sites, particularly. One could argue that the results have a bias, meaning the survey results might not be representative of NIS population. Respondents who answered the survey may favor NISs since they voluntarily participated. This is a challenge of the results from this survey. Yet, the survey also attracted people who were frustrated with the current NIS, as the email invitation specifically mentioned obtaining feedback to guide enhancements. Nonetheless, we recognize the limitation of this survey regarding its potential bias. In summary, we believe that the survey results illustrate the generic patterns as a first-of-its-kind, nationwide NIS user survey. We believe that the results of survey do not yield the power of referential statistics but they are indicative.

** The survey also asked user groups, including community development organizations, about their perceptions of NIS usages. Perceptions are appropriate measures for use of IT in organizations as, for instance, e-mail and system usage logs cannot distinguish "usage increase by confusion" from "usage increase for productivity" [Brown, O'Toole, and Brudney 1998].

information obtained with the survey results.* The author interviewed a total of 20 people, and these interviews were analyzed for content and are presented in Table 13.8.†

13.6 Analysis and Findings

13.6.1 Quantitative Analysis

Better Data Access: Based on this research, we can conclude that NIS creates better data access for community stakeholders, particularly for the community organizations and some government agencies. It seems that different NISs are at different degrees of data sharing, but it was found that the NIS works well as an information sharing tool for community development.

The survey revealed that community nonprofit organizations are the largest group of users of the NIS, with about 30% of the respondents being community nonprofit organizations. Government agencies are the second largest user group with about 18% of respondents (which is a very positive sign that the NIS is an effective local information system). This indicates that government, as a power stakeholder in community development, actually uses the data in the NIS for the local decision-making process. Many times, there is not enough information sharing between different departments of city government, or between different jurisdictions or levels of governments. NIS, being a "one-stop information portal" helps information sharing between them (see Table 13.2).

Regarding the usage frequency, 70% of survey respondents answered they have used their NISs less than three years and another 22% answered more than three but less than six years (see Table 13.3). Most NISs came into existence recently, although there are some NISs that have existed for more than a decade. This result of the survey suggests that we have not yet fully realized the potential of NISs. This is because, in general, the adoption of IT in the public and nonprofit sectors has lagged when compared to the private sector (see Table 13.4).

Table 13.4 presents the frequency of data types that are used. The type of data most used is demographics and housing. This was expected because "demographics" is the foundation for most analysis and "housing" is arguably the most important part of local economic development.

---

* The author conducted field visits in these three cities from March to April, 2007, for a week per each city.

† Interviews mostly lasted about 30 to 45 minutes. For Cleveland, I conducted interviews for two key project team members, one previous project team member, two government agency staff, two data partners, and three users of community organization staff—a total of ten. I also talked to one data partner from a police department and one staff from a funding foundation over the phone for a short time, which was not recorded to be transcribed. For Washington, D.C., I interviewed four people: one government agency, two project team members, and one community organization staff. For Boston, I interviewed three key project team members, including nonprofit organization and government agencies. I interviewed one university partner, to be considered as a technology expert, and two government agency staffs as users—a total of six. I conducted interviews for two other government agency staffs but decided not to include the interviews in the coding report after coding and the coders' meeting. Using Atlas.ti, the author performed a first round of coding, which was to bring out key concepts as an exploratory analysis. This solo-coding work process is suitable for exploratory study as a starting point. Then a second round of coding was done using a hybrid coding strategy: With the codes produced from the first round, the author coded the Kinsley's publications, which are documents of the field expert (the director of NNIP, at the Urban Institute). The coding scheme was discussed with an additional coder to refine definitions, and it has been revisited with multiple rounds of feedback as the author, a first coder, and a second coder progressed. Each coder conducted coding separately with the developed coding scheme and then convened to discuss the results after a pre-test. Then, two coders separately coded all of the transcriptions.

Table 13.2 Type of Users' Organizations

	Frequency	*Valid Percent*
(Community nonprofits, CDC or CBO)	**64**	**29.2**
(Government agencies)	**39**	**17.8**
(University or college)	**36**	**16.4**
(Other)	**25**	**11.4**
(Local intermediary nonprofits)	**17**	**7.8**
(Individual)	**16**	**7.3**
(Foundation)	**8**	**3.7**
(Faith-based organization)	**6**	**2.7**
(Independent research center)	**4**	**1.8**
(National intermediary, LISC)	**4**	**1.8**
Total	219	100.0

Note: N=219

Poverty, income, and economic development data are more often used, compared to transportation, health, environment, public work, and school data. Some data's relatively low usage might have stemmed from the fact that certain types of data were not available in the system, or that some NISs might have different sets of data. The focus of this part of the survey was to gauge overall data usage, but future research should take this into consideration.

Table 13.5 measured user perception on NIS usage. These results confirm a previous qualitative analysis, which found that users utilize their NIS for proposal writing (which they think helped them in performing their tasks). It also shows that users view their experience using the NIS as very positive. One of the enhancement needs they identified was more helpful online manuals and documents.

Table 13.6 shows user perception on the efficacy of the NIS. In general, users were very satisfied. Their responses indicate a need for more training and technical support (see also Table 13.7).

In summary results show that users generally perceive their NIS as a very positive endeavor, and community stakeholders are using NIS as a tool to help perform their tasks.

Table 13.3 How Long Have You Used Your Choice of the NIS?

		Frequency	*Percent*	*Valid Percent*
Valid	(less than 1 year)	**56**	25.3	**30.9**
	2 (1–3 years)	**74**	33.5	**40.9**
	3 (3–6 years)	**40**	18.1	**22.1**
	4 (6–10 years)	**8**	3.6	**4.4**
	5 (10 years~)	**3**	1.4	**1.7**
	Total	181	81.9	100.0

Table 13.4 Usage Pattern of Categories of Data in NIS

Q: How often do you use the following categories of NIS data?	*Never*	*Rarely*	*Sometimes*	*Often*	*Always*
Demographic	8.8%	8.8%	23.6%	40.1%	18.7%
Housing	10.8%	12.5%	21%	36.9%	18.8%
Property Investment	23.1%	22%	22.5%	24.3%	8.1%
Poverty/Income	15%	11.6%	23.7%	32.9%	16.8%
Economic Development	17.8%	17.8%	25.9%	28.2%	10.3%
Crime	18.3%	21.1%	29.4%	24.6%	8.6%
Transportation	27.6%	29.9%	21.3%	17.2%	4%
Health	27.9%	33.7%	18%	14.5%	5.8%
Environment	29.7%	30.8%	19.2%	16.3%	4.1%
School Data	25.9%	29.9%	21.3%	19%	4%
Public Work	32.5%	33.5%	23.4%	12.2%	2.4%

13.6.2 Qualitative Analysis

Usefulness: For the inquiry of probing what the effective NIS is and should be, data and usefulness were mentioned most, as the coding results showed. One interviewee pointed out the benefit of data access and usefulness of an NIS to the users linking to empowerment of communities. She summed up, in light of the ultimate goal of an NIS to create a policy change:

> Yeah, DataCommons. I think that's to really give communities the ability and empower them, I think it is a terrific idea. I actually think that's actually one of the most valuable things that this project has done … really empowering and providing access to data so that people can really use that to create change, and create change on the basis of real information, rather than the perceptions. If you're trying to create some community change, you can have the perceptions about what is going on. But if you are grounded in data, then they're not the perceptions. This is real data that is informing your project. And I think that's a much more valuable way of creating change.

Another user, a city planner, described the benefit of having data available through an NIS in the following. She pointed out the usefulness of comparing her municipality to others. (Note: Boston's project team recently started to expand its geographical boundaries with the MetroBoston DataCommons.)

> We have our own GIS analyst who has built us phenomenal data sets. That's really useful, but it's only X's borders. And that is fine if we're looking at some really small project or if we're looking for information about a single parcel. But if we really want to look for regional implications of a project, or if we're trying to make a case for how

Table 13.5 User Perception on Use, Data, and Software

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
I use the NIS for proposal writing.	18%	11.2%	20.5%	34.2%	16.1%
I use the NIS in strategic planning for my organization.	11.7%	10.5%	22.8%	42.6%	12.3%
I use the NIS in evaluative processes, such as program evaluation and reporting.	14.5%	12.6%	32.1%	30.8%	10.1%
I use the NIS as a basis for more complex and detailed analyses.	6.9%	11.3%	29.4%	35.6%	16.9%
I find the NIS has diverse data sets that can help my tasks.	3.7%	2.5%	17.9%	57.4%	18.5%
I find the NIS has accurate and up-to-date data sets.	3.1%	11.9%	27.7%	47.2%	12.1%
The NIS works well with my existing computer software.	3.7%	3.7%	18.6%	50.9%	23%
I find the interface of NIS (buttons, menus, screen layouts, navigation) satisfactory.	2.5%	11.2%	23.6%	47.2%	15.5%
I easily find helpful manuals and other online documents for using the NIS.	3.7%	12.4%	43.5%	34.8%	5.6%
I find the contents of NIS Web sites to be satisfactory.	1.9%	7.6%	21.5%	59.5%	9.5%

> we compare to the rest of the region for grant application, that information can be …, I spent days for an application once, going town by town in the census and getting the data I needed from every single town. But, you know, this tool sort of allows you to just set it all up and look at it with just a couple of clicks. So it's sort of the way that the information is put together and the fact that it's regional has been, you know, that's sort of why it has been really useful and attractive, from my perspective.

The ultimate goal of an NIS is to create a policy change or community change in their cities as an NIS being an effective and useful tool. This was acknowledged throughout the cities, whether they are in a well established stage or a newly developed stage, or whether they have an online mapping feature or not. It appears that it takes time to develop an NIS, and it takes time to witness changes made with the help of using an NIS.

There are some success stories involving community organizations utilizing their NISs to achieve their missions and programs. One example was to obtain a grant to perform their project in Pittsburgh. An interviewee stated:

Table 13.6 User Perception on Efficacy of System

	Strongly disagree	*Disagree*	*Neither agree or disagree*	*Agree*	*Strongly agree*
Overall, the NIS increases my productivity. Productivity is defined as increased value or results of the tasks for the same amount of time invested, either at the personal or organizational level.	0.6%	1.3%	24.4%	52.5%	21.3%
Online mapping features increases my productivity.	1.9%	3.1%	42.5%	38.1%	14.4%
Predefined or pre-made maps increase my productivity.	0.6%	3.7%	39.8%	43.5%	12.4%
Downloading tables of statistics increases my productivity.	0.6%	2.5%	35%	44.6%	17.2%
Customized analysis/consulting done by the NIS team increases my productivity.	3.2%	2.6%	55.8%	26.9%	11.5%
I can assess to data that I need by using the NIS, which was difficult or impossible to get before the NIS.	1.9%	2.5%	23.6%	44.6%	27.4%
The NIS contributes to the transparency of the local government agencies to the public.	1.9%	3.2%	31%	42.6%	21.3%
The NIS contributes to public participation in the process of decision making for community development.	2.5%	3.8%	38.9%	39.5%	15.3%
The NIS empowers community stakeholders by providing data and knowledge.	1.3%	2.5%	21.5%	45.6%	29.1%
Technical support helps me to use the NIS effectively.	0.6%	3.8%	52.9%	34.4%	8.3%
Training helps me to use the NIS effectively.	1.3%	3.8%	43.9%	37.6%	13.4%

Table 13.7 User Satisfaction on Training Sessions

	N/A	*Strongly disagree*	*Disagree*	*Neither*	*Agree*	*Strongly agree*
I was satisfied with the group training sessions I received (n=153).	39.2%	0%	2.6%	7.8%	32.7%	17.6%
I was satisfied with the individual training sessions I received (n=134).	80.6%	0%	0.7%	9.0%	4.5%	5.2%

> Using two sets of data from Pittsburgh NIS, specifically Act 77 and [xx] Building Inventory data, [we] submitted an application to Rebuilding Together Pittsburgh for [our neighborhood] to be the primary location for the 2007 Rebuilding Day Event. Our application was successful in large part because of the sophistication and timeliness of this data; and as a result, [we] will benefit from over half a million dollars of home repairs and renovations for elderly, low-income, and disabled homeowners.

Some project teams helped community groups use data to change regulations or laws. For example, Providence NIS project team and community groups were able to revise sales of tax-foreclosed properties after presenting solid data and strategies for dealing with vacant properties.

Table 13.8 A Part of Coding Scheme for an NIS Study

Code	*Definition*
Executive Level Connection	• Statements about the reluctance or excitement of leaders to adopt NIS, • Executive level connections between governments, • Universities and nonprofits, • Statements about finding government champions (doesn't include CDCs or CBOs).
Management Leadership	• Statements about streamlining of NIS management, • Statements about building NIS incrementally, • One point of contact for further assistance requests, • Management leadership of all partner groups involved, • Mediation of personality conflicts, coordination, communication.
Relationship-building	• Statements about the relationships between community actors that facilitate effective NIS or hinder effective NIS.
Data	• Statements about quality (accuracy), access, use, and timeliness of data.
User-friendliness	• Statements about the interface, navigation of Web site, • Statements about help menus.

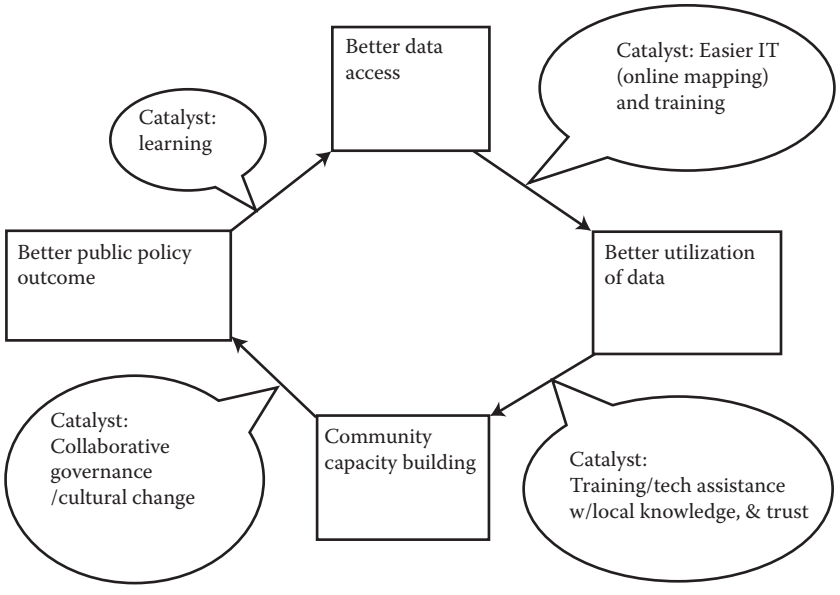


Figure 13.3 Goal of NIS: creating information chain reaction.

Community Empowerment and Participation: The NIS aims to draw active engagement of government agencies in sharing data and then making better policies. As an instrument of government accountability, transparency has been heavily discussed in the public administration discipline recently. Data suggest that the NIS has contributed to an increase of transparency of the government. NIS also contributed to the empowerment of community organizations by allowing better data access and capacity building. However, it was not obviously apparent how much participatory decision-making has increased due to the NIS. The survey and interview data showed a positive but not strong indication on public participation. This probably takes time to witness and should be a further research agenda.

The Lifecycle of an NIS: Figure 13.3 represents the life cycle of an NIS. The NIS aims to create better access to data and better utilization of collected data and knowledge, which in turn helps to build community capacity, which then contributes to better public policy outcomes.

To create an information chain reaction, which is a better policy outcome from better data practice, we should pay attention to the catalyst in this cycle. Advancing IT has been well pursued recently with the NIS movement in the United States, but training and technical assistance have not been stressed enough yet. We argue that it is time to develop and conduct advanced training sessions that are tailored to different groups of users with issue and task specific modules. Catalysts in Figure 13.3 are what are needed to create an information chain reaction between the stages.

13.7 Conclusion and Implications

An effective NIS can and should deliver circular data and knowledge sharing among local economic development stakeholders (Information Chain Reaction, see Figure 13.3). As the saying, "knowledge is power," goes, an effective NIS can serve as a vehicle to empower citizens and nonprofit groups by providing easy access to a variety of local data and information. Still, one

must recognize that information can become knowledge only when well analyzed and presented. Knowledge can become power only when one knows how to use it politically, in this case of a local governance setting. The process of collecting local data and creating better access to it is not a sufficient, but is a necessary, condition to steer policy or political changes.

Our study found some results supporting existing studies addressing the importance of data accuracy and user friendliness to make an NIS effective. Yet, it also found the need for more training. There is a need for different types of training for different user groups, depending on whether users have a prior knowledge of GIS or not. In some cities where you have a high turnover rate in the nonprofits or government, there is a need for constant training of new staff.

We found that the NISs have achieved their goal of creating an information sharing tool to help local economic development and community revitalization. By providing a "data warehouse," community organizations, government agency staff, and researchers can access the data they need, which was difficult or impossible to get before the NIS. This enhanced the empowerment of community organizations. It also has led to a start in an increase in public participation. We also found that the NIS contributed to the transparency of government agencies. All in all, the NIS contributed to the local governance.

How to create a successful NIS, which is effective and sustaining, is of practical and theoretical interest. Practically, public managers and community leaders are working hard to improve their local economic development and to spur community revitalization. We hope this chapter showed contexts and processes of NIS developments and suggested some strategies to go about building one. It has demonstrated the benefit of data sharing and working together closely.

13.8 Future Directions and Challenges

We found that these intermediary organizations enhanced data sharing and inclusive flows of information in the local governance settings. Processes of building indicators or NISs consequentially increased the dialogue between local stakeholders, particularly between nonprofit organizations and government agencies. Today, we are moving to a data-driven decision making model, particularly in grant-making and evaluation practices. Without the access to the data, nonprofit organizations cannot start participating in any meaningful way. Thus, increased dialogue and sense of empowerment can be starting points for democratic discourse.

Some examples show a potential of inclusive and democratic dialogue in their localities. As one contact put it, "In my opinion, the 15 years that we have been providing this information free to neighborhood residents and community based organizations here in Northeast Ohio has changed their level of influence on local government and led to important collaborations." Although NISs possess some of the attributes of democratic intermediaries, the potential of neighborhood information systems to catalyze inclusive political practices (i.e., e-democracy, e-participation) has not yet been realized to a meaningful extent and will be difficult to achieve.

NISs are difficult to establish and maintain. A combination of entrepreneurial activity of local intermediaries and funding assistance from local foundations or national foundations as well as funding from both federal and local governments are typically required to bring neighborhood information systems into existence and furthermore sustain. Some NIS project teams successfully integrate their research and project funding into their NIS sustainability, but it is also challenging to continue funding data and technology, particularly during a downturn in the economy. We are hopeful and optimistic of NIS's future direction, yet we have been witnessing struggles for sustainability and funding challenges through our experiences of participating in the development of

NISs in multiple cities. We would like to end with a call for further research on the sustainability of NIS and other technology innovations.

Acknowledgments

The authors gratefully acknowledge interviewees and project team members from Grand Rapids, Pittsburgh, Cleveland, Boston, and Washington, D.C., as well as survey respondents from many cities across the United States. This material is based on work supported by the National Science Foundation, under Grant 05-574. Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF).

This chapter is a combined and modified version of two manuscripts: "In pursuit of the effective neighborhood information system: User-friendliness and training," *Government Information Quarterly*, v26 (1) (2009) and "Advancing e-governance at the community level: Creating an information chain reaction with Neighborhood Information System" e-Governance symposium: Online consultation and public policy making: Democracy, identity, and new media, at the Ohio State University on March 14, 2008.

References

Arnstein, Sherry R. 1969. A ladder of citizen participation. *Journal of the American Planning Assocation* 35 (4):216–224.

Bailey, Terri J. 1997. Building community capacity to use information: A framework. In *National Neighborhood Indicators Partnership Report*. Washington, D.C.: The Urban Institute.

———. 2000. Building community capacity to use information: Four training options from the experience of the national neighborhood indicators partnership. In *National Neighborhood Indicators Partnership Report*. Washington, D.C.: The Urban Institute.

Behn, Robert D. 2006. The varieties of CitiStat. *Public Administration Review* 66 (3):332–340.

Bretschneider, Stuart. 1990. Management information systems in public and private organizations: An empirical test. *Public Administration Review* 50 (5):536–545.

Brown, David. 2005. Electronic government and public administration. *International Review of Administrative Sciences* 71 (2):241–254.

Brown, Mary Maureen, Laurence J. O'Toole, Jr., and Jeffrey L. Brudney. 1998. Implementing information technology in government: An empirical assessment of the role of local partnerships. *Journal of Public Administration Research and Theory: J-PART* 8 (4):499–525.

Coe, Amanda, Gilles Paquet, and Jeffrey Roy. 2001. E-governance and smart communities: A social learning challenge. *Social Science Computer Review* 19 (1):80–93.

Craig, William J., and Sarah Elwood. 1998. How and why community groups use maps and geographic information. *Cartography & Geographic Information Systems* 25 (2):95–104.

Delone, William H., and Ephraim R. McLean. 1992. Information systems success: The quest for the dependent variable. *Information Systems Research* 3 (1):60–95.

Elwood, Sarah. 2002. The impacts of GIS use for neighborhood revitalization in Minneapolis. In *Community participation and geographic information systems*, edited by W. J. Craig, T. M. Harris, and D. Weiner. London: Taylor & Francis.

Fountain, Jane E. 2001. *Building the virtual state: Information technology and institutional change*. Washington, D.C.: Brookings Institution Press.

Garson, G. David. 1999. *Information technology and computer applications in public administration: Issues and trends*. Hershey, PA, USA: Idea Group Pub.

Ghose, Rina. 2001. Use of information technology for community empowerment: Transforming geographic information systems into community information systems. *Transactions in GIS* 5 (2):141–163.

Ghose, Rina. 2003. Community participation, spatial knowledge production, and GIS use in inner-city revitalization. *Journal of Urban Technology* 10 (1):39–60.

Ghose, Rina, and Sarah Elwood. 2003. Public participation GIS and local political context: Propositions and research directions. *Urban and Regional Information Systems Association (URISA) Journal* 15, Access and Participatory Approach (APA) (2):17–24.

Ghose, Rina, and William E. Huxhold. 2002. Role of multi-scalar GIS-based indicators: Studies in formulating neighborhood planning policy. *Urban and Regional Information Systems Association (URISA) Journal* 14 (2):5–17.

Goldsmith, Stephen and William D. Eggers. 2004. *Governing by network: The new shape of the public sector*. Washington, D.C.: Brookings Institution Press.

Henderson, Lenneal J. 2003. *The Baltimore CitiStat program: Performance and accountibility*. In IBM: Managing for Results Series, Washington, D.C.: IBM Center for the Business of Government.

Ho, Alfred Tat-Kei. 2002. Reinventing local governments and the e-government initiative. *Public Administration Review* 62 (4):434–444.

Ho, Alfred Tat-Kei, and Anna Ya Ni. 2004. Explaining the adoption of e-government features: A case study of Iowa county treasurers' offices. *American Review of Public Administration* 34 (2):164–180.

Huxhold, William E. 1991. *An introduction to urban geographic information systems*, *Spatial information systems*. New York: Oxford University Press.

Hwang, Sungsoo. 2006. Role of the university in the partnership for IT innovations of community development: Utilizing universities' assets for "neighborhood information system" development. *Public Administration and Management: An Interactive Journal* 11 (2):75–100. Available at http://www.pamij.com.

Kernaghan, Kenneth, and Justin Gunraj. 2004. Integrating information technology into public administration: Conceptual and practical considerations. *Canadian Public Administration* 47 (4):522–525.

Kettl, Donald F. 1988. *Government by proxy: (Mis?)managing federal programs*. Washington, D.C.: CQ Press.

Kettl, Donald F. 2002. *The transformation of governance: Public administration for twenty-first century America: Interpreting American politics*. Baltimore: Johns Hopkins University Press.

Kim, Pan Suk. 2004. Development of democratic e-governance in cyberspace and shaping e-governance for quality of life. Paper read at 26th International Congress of Administrative Sciences, 14–18 July 2004, at Seoul, Korea.

Kingsley, G. Thomas. 1998. Neighborhood indicators: Taking advantage of new potential. In *National Neighborhood Indicators Partnership Report:* The Urban Institue.

Kingsley, G. Thomas. 1999. Building and operating neighborhood indicator systems: A guidebook. In *National Neighborhood Indicators Partnership Report*: The Urban Institute.

Kingsley, G. Thomas, and Kathryn Pettit. 2004. Neighborhood information systems: We need a broader effort to build local capacity. *Urban Institute*, available at http://www.urban.org/publications/900755.html.

Kirschenbaum, Josh, and Lisa Russ. 2002. Community mapping: Using geographic data for neighborhood revitalization: A Tool from the Equitable Development Toolkit. Oakland, CA: Policy Link.

Kraemer, Kenneth L., and Jason Dedrick. 1997. Computing and public organizations. *Journal of Public Administration Research & Theory (Transaction)* 7 (1):89.

Kraemer, Kenneth L., John Leslie King, Debora E. Dunkle, and Joseph P. Lane. 1989. *Managing information systems: Change and control in organizational computing*. 1st ed, The Jossey-Bass management series. San Francisco: Jossey-Bass Publishers.

Leitner, Hegla, Robert McMaster, Sarah Elwood, Susanna McMaster, and Eric Sheppard. 1998. Models for making GIS available to community organizations: Dimensions of difference and appropriateness. In *National Center for Geographic Information and Analysis Specialist Meeting on Empowerment, Marginalization and GIS*. Santa Barbara, CA.

Moon, M. Jae. 2002. The evolution of e-government among municipalities: Rhetoric or reality? *Public Administration Review* 62 (4):424–433.

Moynihan, Donald P. 2003. Normative and instrumental perspectives on public participation: Citizen summits in Washington, D.C. *American Review of Public Administration* 33 (2):164–188.

Nunn, Samuel. 1999. The role of information technologies in community development organizations. *Journal of Urban Technology* 6 (2):13–37.

Pattavina, April, Glenn Pierce, and Alan Saiz. 2002. Urban neighborhood information systems: Crime prevention and control applications. *Journal of Urban Technology* 9 (1):37–56.

Pierre, Jon. 1998. *Partnerships in urban governance: European and American experience*. New York: St. Martin's Press.

Pinkett, Randal. 2003. Community technology and community building: Early results from the Creating Community Connections project. *Information Society* 19 (5):365.

Policy Link, and LISC. 2002. Mapping for change: Using geographic information systems for community development. New York: The local initiatives Support Corporation.

Ramasubramanian, Laxmi. 2004. Knowledge production and use in community-based organizations: Examining the influence of information technologies. *Cityscape: A Journal of Policy Development and Research* 7 (1).

Riley, Thomas B. 2003. E-government vs. e-governance: Examining the differences in a changing public sector climate. In *International Tracking Survey Report'03*. Ottawa, Canada: Common Wealth Centre for E-Governance.

Roy, Jeffrey. 2003. The relational dynamics of e-governance: A case study of the city of Ottawa. *Public Performance & Management Review* 26 (4):391–403.

Salamon, Lester M. 1995. *Partners in public service: Government-nonprofit relations in the modern welfare state*. Baltimore: Johns Hopkins University Press.

Salamon, Lester M., and Odus V. Elliott. 2002. *The tools of government: A guide to the new governance*. New York: Oxford University Press.

Sawicki, David S., and Patrice Flynn. 1996. Neighborhood indicators. *Journal of the American Planning Association* 62 (2):165.

Scavo, Carmine, and Yuhang Shi. 2000. Public administration: The role of information technology in the reinventing government paradigm—Normative predicates and practical challenges. *Social Science Computer Review* 18 (2):166–178.

Scott, W. Richard. 1992. *Organizations: Rational, natural, and open systems*. 3rd ed. Englewood Cliffs, N.J.: Prentice Hall.

Seedco. 2002. *The evolving role of information technology in community development organizations*. New York: Structured Employment Economic Development Corporation (Seedco).

Selm, Martine Van, and Nicholas W. Jankowski. 2006. Conducting online surveys. *Quality and Quantity* V40 (3):435–456.

Sieber, R. E. 2001. A PPGIScience? *Cartographica* 38 (3/4):1–4.

Snellen, Ignatius T. M. 2002. Electronic governance: Implications for citizens, politicians and public servants. *International Review of Administrative Sciences* 68 (2):183–198.

Song, Hee Joon. 2002. Prospects and limitations of the e-government initiative in Korea. *International Review of Public Administration* 7 (2):45–53.

The Urban Institute. 1999. Stories: Using information in community building and local policy. In *National Neighborhood Indicators Partnership Report*: The Urban Institute.

Thomas, John Clayton. 1990. Public involvement in public management: Adapting and testing a borrowed theory. *Public Administration Review* 50 (4):435–445.

Thomas, John Clayton, and Gregory Streib. 2003. The new face of government: Citizen-initiated contacts in the era of e-government. *Journal of Public Administration Research & Theory: J-PART* 13 (1):83 (19).

Treuhaft, Sarah. 2006. The democratization of data: How the internet is shaping the work of data intermediaries. Institute of Urban & Regional Development Working Paper Series. (Paper WP-2006-03), http://repositories.cdlib.org/iurd/wps/WP-2006-03.

Treuhaft, Sarah, Arnold Chandler, Josh Kirschenbaum, Melissa Magallanes, and Randal Pinkett. 2007. *Bridging the innovation divide: An agenda for disseminating technology innovations within the nonprofit sector*. Oakland, CA: Policy Link and BCT Partners.

Weitzman, Beth C., Diana Silver, and Caitlyn Brazill. 2006. Efforts to improve public policy and programs through data practice: Experiences in 15 distressed American cities. *Public Administration Review* 66 (3):386–399.

IV

ORGANIZATIONAL ISSUES AND MANAGEMENT APPLICATIONS

Chapter 14

The State of Federal Information Technology Management Literature: Is Public Administration Relevant?

Stephen H. Holden

CONTENTS

14.1 Introduction

Given the generally acknowledged importance of effective information technology (IT) management to the basic functioning of public programs, the sophistication of the policy, theory, and practice in this area should be evolving quickly to keep pace with developments in practice. Unfortunately, that is not so [Holden, 1996; Holden & Hernon, 1996; Fountain, 2001]. As a

result, it is quite possible that the current generation of public administration scholars and practitioners may be ill equipped to face the challenges they face daily.

A mere gap between IT management theory and practice might not be fatal, but the implications for the public, and therefore governance, are quite profound. Press accounts of the interoperability challenges first responders faced during the World Trade Center attacks on 9/11 offer just one example of how integral public sector IT has become to the safety and economic well-being of the country. While the billions of dollars currently spent by the federal government on IT make up an insignificant portion of the budget, IT underpins almost the whole budget directly or indirectly. Arguably, government performance is now as much a function of the management of information resources as it is the management of financial and human resources. Given recent public opinion polling on public attitudes about the performance of federal agencies, which shows a little more than one quarter of Americans give federal agencies a positive rating, there is clearly room for improvement [Partnership for Public Service and Gallup Consulting, 2008].

This chapter compares the federal IT management literature with a normative model of management maturity, examining the strategic objectives for IT and the related management approaches. Although the analysis of the literature does include government publications, it does not discuss the pertinent public law or government-wide policy [See instead Beachboard & McClure, 1996; Holden, 1994; Plocher, 1996]. Like public administration more generally, IT management draws on several different sources, including business administration, state and local government management, information sciences, and public administration. Unlike other management topics in public administration, though, the literature covering IT management lacks breadth and maturity. Even more alarming, Kraemer and Dedrick's [1997] review of the public administration literature for managing IT found that research on public sector computing was declining when federal agencies were relying more heavily on IT. The following quotation summarizes the state of the literature at the turn of the 21st century:

> A century from now, social and policy scientists will look back with amusement and no small amount of condescension at the glacial pace with which social scientists moved to consider fundamental changes in information processing and their implications [Fountain, 2001, p.10].

While the chapter documents some progress in the field in the last several years since a similar review was published [Holden, 2007], it also points to continuing shortcomings. It is particularly troubling that disciplines besides public administration are responsible for the few recent developments in federal IT management literature. Compared against the management maturity model presented below, there is clearly much work left to do.

14.2 A Model for Information Technology Management Maturity

This analysis of federal IT management literature proceeds in an order that reflects the maturation of the strategic objectives for IT and the attendant management philosophy over the last 40 years. As a normative standard, this analysis adapts a model of maturation of theory and practice that Donald Marchand [1985] first used for the field of information management [Holden, 1994]. He identified four stages of evolution for information management, encompassing the 20th century.

This chapter adapts his model as an organizing principle in several ways. First, because this analysis deals with the management of IT, it does not include his Stage 1, which addresses the

physical control of information before automation in the 1950s. Second, Marchand discusses the evolution of information management for five distinguishing characteristics: (1) precipitating forces; (2) strategic objective; (3) basic technologies; (4) management approaches; and (5) organizational status. This chapter stresses how strategic objectives for and management approaches to IT have evolved, placing little emphasis on the other three characteristics. Third, because Marchand covers information management, which is broader than IT management, the names for the stages differ. Finally, the stages used to organize this chapter reflect the stage of development of the literature, despite the date of its publication. In contrast, Marchand demarcated his stages by time periods, assuming that all activities within a specified period of time conformed to the same stage of development in management.

The adaptation of Marchand's model is quite consistent with stage or phase models used in the information systems (IS) literature. For instance, one of the classic texts [Applegate, McFarlan, McKenney, 1999] for what business schools call Management Information Systems (MIS) discusses three major eras of computing in organizations. The eras cited in this MIS text mirror the three stages used to organize this chapter in terms of the prevailing technology and level of management attention in each era or stage. Peppard and Ward [2004] used what they call a widely accepted notion of these three eras of computing in organizations as the organizing frame to assert that there is a new era emerging in IT management in both theory and practice.

More recently, there is some research paralleling Marchand's model that specifically addresses e-government. Dawes [2008] articulated a model of e-government that shows how technologies, laws and policies and implementation themes have evolved in the last 20 years. Much like Peppard and Ward, Dawes asserts that organizational use of information and technology are at an inflection point for significant change. In particular, she cites the emergence and public adoption of Web 2.0 capabilities (i.e., wikis, blogs, and social networking) and organizational deployment of related Web 2.0 technologies (e.g., open source software, data standards like XML, and cloud computing) as the drivers for this inflection. These three examples lend support to the credence of this chapter's adaptation of Marchand's work and also point to emergence of a new phase or stage 4 that should be informing both the theory and practice of federal IT management as discussed in the concluding section of the chapter.

14.2.1 Stage 1—Management Information Systems

This stage, which Marchand labeled "Management of Automated Technology," spanned the 1960s through the mid-1970s. Then business and public sector professionals often used the term MIS to describe IT. The management of technology dominated this era at the expense of management of information. Because the management of the technology was limited to the data center, there was little concern for relating those resources to other facets of management in organizations.

The management approaches for IT of this era reflected the isolation of the IT professional from broader functional and executive oversight. Organizations used IT to automate backroom operations, with the primary strategic objective being to improve the efficiency of clerical activities [Zuboff, 1988]. Personnel in the data processing function took primary responsibility for the management of these resources and focused on the development of applications and systems. Typically, these systems consisted of applications run by data processing professionals in centralized processing facilities that consisted of mainframe computers. Users had few direct contacts with these systems other than to fill out punch cards, do manual key entry, and receive printouts from the data processing department. As a result, line functions in the organization rarely controlled their own computing resources [Ackoff, 1967].

The early MIS literature dealt almost exclusively with private-sector applications. It was not until much later that public administration adapted MIS literature to public-sector theory and practice. In 1986, Bozeman and Bretschneider articulated a case for a separate body of literature to address the unique information needs of public organizations. They proposed that this body of theory and practice falls under the heading of public management information systems (PMIS).

To support this argument, they asserted that MIS literature ignores variables external to public sector organizations, such as the political environment and the annual appropriation process. The political control of public organizations, which entail uncertain and variable goals, means that public- and private-sector methods for establishing IT performance indicators differ dramatically. Though private and public organizations can acquire the same hardware and software, they content different organizational environments that require unique system design techniques. While this notion of PMIS brought attention to the use of IT in the public sector, it had limited applicability as a management approach. Instead of viewing IT as a strategic resource for public-sector organizations, this perspective examined the development of one application at a time.

Some theoretical work in evaluating information systems surfaced during this time nonetheless, which applies generally to public-sector organizations. Newcomer and Caudle (1991) provide some insights into how and why the evaluation of information systems in the public sector should go beyond mere return-on-investment criteria. In particular, they offer a framework for evaluation that includes qualitative and quantitative measures and recognizes the multiple uses of most public information systems. Although this framework does not help agency decision makers choose between competing projects, it, nonetheless, broadened the theoretical base for evaluating individual systems projects.

Stevens and McGowan's work [1985] presents an overview of information systems management for public administrators from the local to the federal level. Their book adapts contingency-based organization theory to explain how public organizations must process information effectively to respond to their environment. For the most part, the book focuses on managing single applications and makes illustrative points through the discussion of three case studies. Although it does cover a variety of topics, including management, policy, and technology, it does not provide an organization-wide or strategic view of managing IT.

Despite some maturation of the literature during the MIS stage, theory was apparently not meeting the needs of practice. Even in the private sector, which had embraced information technology as a source of great organizational efficiency, the MIS philosophy fell prey to vocal criticism as the developers rarely interpreted user needs accurately, and even if they did, it took so long to write the programs to run the systems that the original user requirements changed. After corporate managers spent millions of dollars to buy and subsequently upgrade MIS that did not provide the expected results, this criticism became more widespread. After fixating on the technology and the life cycle, organizations evidently still did not build the information systems they needed. As a result, a new, broader perspective for managing IT emerged as an alternative to MIS in the early 1980s.

14.2.2 Stage 2—Information Resources Management

Ironically, after practically creating the field of practice and theory of MIS, the private sector did not lead the next phase of IT management theory. Stage 2 signaled the replacement of MIS with a theory of information resources management (IRM). The federal government ushered in this new state of IT management with the passage of the Paperwork Reduction Act (PRA) (1980). The PRA articulated a need for the federal government to manage information and IT as a resource, much like financial and human resources [Caudle, 1987]. Though the PRA created requirements

for managing both information and IT in the federal government, Marchand uses the term IRM to refer to a philosophy for managing IT more generally, as does this chapter.

IRM, as the Stage 2 perspective for managing IT, reflected change in both the technical and the external environments of organizations from the mid-1970s to the mid 1980s. Information technology began to move out of the data center with the arrival of minicomputers and the introduction of microcomputers. With this decentralization of computing power, management approaches had to shift from the data center to include user organizations. Strategic objectives for IT also changed as line organizations began to realize that they could use IT for more than just backroom functions. As a result, program offices often acquired their own IT when data processing organizations could not keep pace with their needs. These changes, combined with the increasing level of spending on IT in organizations, brought these resources to the attention of a broader range of managers [Marchand, 1985].

In response to the disillusionment with a management perspective focused on single applications mentioned earlier (i.e., MIS), private-sector organizations and business schools began to think more about how to tie together disparate systems to form an organization-wide perspective. Often, data processing organizations call such perspectives "architectures." This view represented a departure from the earlier philosophy of managing IT because it assumed that systems existed outside the physical and management control of a central data center.

Applegate, McFarlan, and McKenny [1983] also took an organization-wide view of managing IT, which they called "the Information Systems (IS) function." Their work distinguished itself in recognizing that organizations, especially large ones, often manage many information systems projects at once. As a result, the IS function, which we now refer to as the Chief Information Organization (CIO), dealt with issues arising from coordinating several systems projects, going beyond exerting life cycle management control over individual projects.

International Business Machines (IBM) (1984) developed a systems planning methodology called Business Systems Planning (BSP) that offered a framework for managing a collection of information systems across organizations. Specifically, BSP provided organizations, public or private, with a method for creating an information systems plan.

> Experience has shown that BSP can be applied to all institutions in the public sector and all industries in the private sector, because the requirements for developing information systems are similar no matter the business served or the products and services provided [IBM, 1984, p. I].

Even though BSP does not address the planning or use of individual systems, it does create a framework for linking systems planning to the broader purposes of the organization.

IBM's stated intent in creating BSP was to develop a methodology for creating a plan that would overcome the historic weaknesses of information systems implementation, generally attributed to a lack of planning. In part, IBM built on its own attempts to deal with the plethora of systems that each of its own functions had developed over time. The keys to this new method, as IBM espoused them, were using top-down planning and analysis of organizational processes, relying on bottom-up implementation, translating organizational objectives into information systems requirements, and using a structured methodology [IBM, 1984].

Consistent with IBM's view that the BSP method applied to public and private sector organizations, collections of articles on IRM issues appeared during this stage of the literature. For instance, Rabin and Jackowski [1988] edited a volume that touched on a variety of IRM issues, including information systems management, data administration, and applications such as decision support

systems and data bases. While sections of the volume dealt with public-sector IRM [Marchand & Kresslein, 1988], the balance of the work was so general that applying it to any particular kind of organization was difficult.

To date, only two academic studies have addressed the implementation of the Paperwork Reduction Act, the primary legislation bringing the concept of IRM to life, by federal agencies. Caudle [1987] conducted the first study, documented in a report for the National Academy of Public Administration (NAPA). This report included the results of interviews with federal IRM officials in cabinet-level agencies, selected subagency organizational units, and the central oversight agencies. She used these interviews to learn how agencies had organized to meet the mandates of the PRA and to assess whether the principles contained in the Act had begun to pervade agency attitudes and behavior.

Caudle's work provided groundwork for subsequent public administration advances in IT management. In particular, she found that agency staff identified the strategic planning and budget processes as the "dominant IRM management control mechanisms." This attitude manifested itself in the respondents viewing IT management as guiding a project through the acquisition approval process at GSA and the budget approval process at OMB. In the conclusion to the report, Caudle recommended future research into control mechanisms for information resources. Such mechanisms, she noted, might differ from those used for financial and human resources. Additionally, her work serves as the foundation for GAO's Strategic Information Management study discussed later.

The second study, conducted by Levitan and Dineen [1986], also relied on interviews with selected federal IRM officials. This research differed from the Caudle's [1987] report for NAPA in that Levitan and Dineen first established a model of what they called "integrative IRM" and used that as a basis for assessing the state of the art of integration of federal IRM in 1985. In the authors' views, managing IT is complex because such management issues transcend normal organizational boundaries. Specifically, Levitan and Dineen cited strategic planning, implementation of technology, and interaction with the organizational constituencies as examples of integrative issues for federal IRM.

Having constructed this model of the integrative nature of federal IRM, the authors conducted interviews with representatives from several federal agencies and one bureau of a federal agency. They posed questions about whether managing information resources in the organization extended beyond information systems to include information management (e.g., functions such as dissemination and records management) and whether notions of IRM extended to the program offices.

The Levitan and Dineen findings confirmed several of those cited by Caudle [1987] in her study published by NAPA. For the most part, agencies had not fulfilled the mandate of the PRA by integrating the management of information systems and information content. The federal IRM offices represented in the interviews cited the management of information systems overwhelmingly as their major concerns. This reflected the information systems background of those staff who had risen to management positions in IRM. Agencies relied on task forces to achieve integration of IRM issues across normal organizational boundaries. Levitan and Dineen found no consistent patterns of whether agencies had succeeded in integrating IRM as a management discipline in program operations.

Bishop, Doty, and McClure [1989] prepared a compendium of views on federal IRM from the two aforementioned studies, and academic literature, and GAO, OMB, and GSA publications that went beyond just the carrying out of the PRA. Their paper presented a matrix of various observers' critiques on the status of IRM in the federal government. Comparing these critiques, they identified strong agreement on several points such as: (1) insufficient integration of IRM at

the agency level; (2) insufficient integration of IRM with agency mission and program management; and (3) a need for better planning. Only one element of the matrix dealt with the management of IT, and the respondents split evenly on the issue of whether IRM suffered from an overemphasis on technology.

Several other contributions from information sciences bring more insight into state of IRM policy development and to some extent implementation. Beachboard and McClure [1996] point out some inherent inconsistencies among the various federal oversight bodies and policy instruments. To help deal with weaknesses in IRM policy they cite, Beachboard and McClure advocate changes in IRM policy, federal agency commitment to IRM as a management discipline, and further empirical research into the lack of effectiveness of IRM policy and practice. A similar publication on federal IRM finds that neither policy nor practice seems able to bring federal agencies into the information age, thereby enabling wide-scale electronic service delivery [Bertot, McClure, Ryan & Beachboard, 1996]. Without much empirical grounding, the authors offer a mix of policy, organizational, and investment choices that they assert will enhance the effectiveness of federal IRM policy and practice.

Consistent with the maturing view of IRM, the research on local governments' use of IT began to explore the benefits from investments in automation. An analysis of survey data collected from 46 U.S. cities found that payoffs accrued in fiscal control, cost avoidance, and improved service delivery mechanisms. This study also found that it took longer than anticipated to realize some benefits and that expected payoffs in better information for management and planning had yet to appear [Northrop, 1990].

Other research has included IT management as part of an examination of IRM in state governments. The Syracuse University School of Information Studies [1989] produced a nationwide study on the maturity of IRM in state governments. This study used data collected from a survey of 2,200 program managers and information systems directors to characterize their views on the state of the art across several IRM activities, including IT usage and acquisition. It did not, however, discuss management techniques for IT or the strategic role of IT for stage governments.

At the county level, Fletcher and Bertot [1993] examine the extent and impact of centralization of information services. The article is a based on a national survey of the largest 450 counties in the United States, supplemented with case studies of 13 counties ranging from very small to very large. The survey gathered data on the extent of user agency versus central IT department equipment ownership, IT operation, network configuration, software development strategies and the operation of "office systems." The analysis of these data reflected the shift of role of the central IT organization from controller of all IT resources to provider of resources. The authors called this a collaborative model between central IT and user organizations and asserted these data support a finding that county governments were succeeding at IRM while federal agencies were not, at that time.

A consistent theme emerges from the literature of Stage 2, covering IRM. The application of theory and practice from this era has been very uneven. The federal government, in particular, still relies extensively on centralized, mainframe information processing and a similarly centralized management approach, which does not support the sharing and integration envisioned by IRM proponents. A lack of agreement on the meaning and relevance of IRM, as manifest in the publications advocating continued changes to basic federal law and government-wide policy for IRM continues to thwart the adoption of the core management principles. This may be, in part, because researchers outside public administration, most notably information sciences, have done most of the research on IRM policy.

There is still work being done, though, to solidify the role of information and IT in public organizations in the tradition of PMIS started in the mid to late 1980s. Rocheleau [2006] has

published a text devoted solely to the management of IT in the public sector. It begins with a discussion of how the management of IT differs between the public and private sectors. The bulk of the book, though, outlines key management issues and techniques for IT management that public administrators should know. This text is one of the few examples that focuses exclusively on public IT management and includes discussions of some of the political and ethical issues that are unique to the public sector IT. The strategic focus for IT remains largely the same however: efficiency. Although efficiency of government service delivery to the public, as compared with the efficiency of just backroom functions, represents some progress, the ultimate goal remains lower costs. These notions of IRM as a management philosophy and strategic focus for IT remain mostly inwardly focused to the organization, except for preliminary discussions of electronic service delivery. Despite, or perhaps because of, the limited success of IRM, a new era for managing IT has begun to emerge.

14.2.3 Stage 3—Managing Information Technology in an Information Age

While many organizations strive to make the transition from Stage 1 (MIS) to Stage 2 (IRM), further developments in managing IT are forming the outline of a new stage. Marchand calls this stage "knowledge management" to highlight the shift in emphasis from the physical management of technology and information to the management of information content. Although there is now considerable interest in the area of "knowledge management" as a field of study and practices with the information systems field, Marchand's use of the term has a narrower meaning than we now generally find. He contends this stage of development began in the mid-1980s and will continue through the 1990s. While the management of information content is emerging as a new skill, the successful application of IT makes it possible to maximize the benefits of information content [Marchand, 1985]. The IS literature typically refers to this stage as the strategic information systems stage, or the information age, where the benefits of managing information content translates into competitive advantage in the marketplace [Applegate, McFarlan, McKenney, 1999].

At the outset, though, a more precise definition of the term "information age" is in order. It is generally used to describe a future state where information will be quickly and universally accessible in electronic form. Dizard [1985, 1989] described his view of an information age but implied that our society has not yet arrived there. The mature phase, which he believed would arrive in the 1990s, would entail the mass availability of IT and technology-based information services to consumers in their homes. Many of these new services would be made available, not through the personal computer, but with existing appliances in many homes—e.g., the television and the telephone. To a great extent, this third stage of the information age is becoming a reality more quickly than even Dizard might have envisioned. For that reason, this part of the chapter uses that description of the term "information age" to help frame the most mature phase of management philosophy for IT.

As an indication of how powerful the notion had become at that time, the Clinton administration described an information age initiative promoting new uses for IT in federal agencies [Office of Science and Technology Policy, 1993]. This report brought a new strategic focus to the uses of IT for federal agencies as a service delivery vehicle, requiring new management approaches and supporting policies. The Clinton administration envisioned that the federal government would use IT to make agencies more responsive and service-oriented. Instead of using automation to make government operations more efficient for internal processing, agencies would use IT to reach out to the public to provide timelier and higher quality service.

Comparing differences between an information age philosophy and IRM point to the evolution of management approaches for federal IT management. One difference is a more robust understanding in the information age of how important the technological infrastructure is. Emerging and maturing technologies such as graphical user interfaces, client-server computing, and workstations create a foundation for more substantial user involvement in information management. Additionally, this reality requires recognition that technology cannot be managed effectively from the mainframe data center to the exclusion of management of the desktop and everything in between.

One of the most vocal proponents for a new management philosophy for technology was Strassman [1990], who extended the IRM view of managing information systems to an organization-wide perspective. Strassman created a 137-item policy checklist for managing IT based on his work in the private sector before becoming the Chief Information Officer (CIO) for the Department of Defense. He stresses that the policies for managing information systems should place responsibility in the hands of the users, not the IRM specialists. These policies include: (1) using economic analysis that promotes trading off between information resources and other resources; and (2) providing mechanisms that charge users for information and information systems. He also introduces the notion that organizations should examine and redesign work processes before automation to ensure that automation does not just speed up archaic and unneeded functions. The unifying theme presented by his list of policies is to ensure that investments in information systems add measurable value to the core missions of the organization.

Without identifying it as such, Strassman's approach of aligning information resources to organizational missions falls under the rubric of strategic management. Strategic management represents an effort by private and public sector managers to make strategic planning more useful in meeting the short-run needs of organizations. Much like Strassman, business authors writing about strategic management talk about aligning corporate resources and missions to take advantage of opportunities in the market. Strategic management emphasized looking at resource allocation processes and support systems to see how they added value to a business [Hax & Majluf, 1984]. For use in the public sector, public administration authors have adapted these models for differences in civil service traditions in political environments [Nutt & Backoff, 1992]. Some public-sector models of strategic management explicitly include and highlight the role of IT in strategic management processes [Adler, McDonald, & MacDonald, 1992; DeLisi, 1990].

An analysis of a national survey of public managers' views of IT issues provided further insight into differences and similarities between public and private sector management in this area. Caudle, Gorr, and Newcomer [1991] compared the results of a 1988 survey of managers in federal, state and local agencies to similar studies of private sector organizations. The comparison of the public sector survey to the previous survey of private sector managers found that 7 of 10 top issues are common between the 2 groups. The authors found some differences in the relative ranking of the issues, leading them to conclude that the public sector was still grappling with some issues that private sector organizations had been able to deal with more quickly. For instance, public sector respondents ranked issues as integration of technologies and end-user computing as high priority issues where their importance had been declining over time for private sector managers. They did find that both groups rated the issues of aligning IT with agency goals and IT planning near or at the top of their respective lists, indicating that a strategic orientation was beginning to take hold in the public sector.

GAO [1994] has taken a more preventive approach to dealing with federal agency problems managing IT and grounded it in the literature of strategic management. In doing so, GAO not only presents a new management approach for IT grounded in systematic research, it also brings

the new strategic objective of mission performance into discussions of why the successful management of IT is so important. Within the federal IRM community, GAO's work in this area often goes by the label of either "strategic information management" (SIM) or "best practices" [Caudle, 1996].

Part of what separates this GAO effort from "typical" GAO reports is the rigor of the analysis supporting GAO's recommendations for change. GAO went to some lengths to find case study examples of effective IT management practices in both the private and public sectors and included federal agencies beyond state governments. Throughout the process of deriving the key best practices from the case study research, the GAO team consulted with federal IRM executives and oversight organizations such as Congress, OMB, and GSA to help ensure that the practices were applicable in the federal environment. As part of the case study analysis, the research relied heavily on empirical evidence of improved mission performance resulting from the use of the best practices.

While not explicitly linking the research or the findings to a particular body of literature, it becomes apparent from viewing the list of practices that GAO has created a strategic management framework specifically for managing IT. The practice GAO advocated are: (1) directing IRM changes; (2) integrating IRM decision making in a strategic management process; (3) linking mission goals and IRM outcomes through performance management; (4) guiding IRM project strategy and follow-up through an investment philosophy; (5) using business process innovation to drive IRM strategies; and (6) building IRM/line partnership through leadership and technical skills [Caudle, 1996]. Although some of the language and the term IRM pervade best practices report, GAO's work has clearly brought both federal IT theory and practice to another level of management maturity.

Compared with the model of management maturity posited earlier, GAO's research, the resulting report, and the associated toolkits contribute new viewpoints to the strategic objectives and management approaches for IT. The strategic objective for the GAO's best practices work is unambiguously clear with the discussion of both strategic planning and mission performance, grounded in related program effectiveness measures. In effect, this implies a life cycle management approach to linking IT plans, investments, and results. The mission focus also becomes apparent as the management approach seeks high alignment of IT investments with strategic plans and greater partnership between IRM and program staff. An investment management philosophy, grounded in the budget process, gives the whole management approach "teeth" and helps to guard against the tendency for more traditional IT plans to lie unused.

One academic study examined federal agency implementation of GAO's SIM framework to assess how the practices from leading organizations, mostly from outside the federal government, were being implemented. Westerback [2000] analyzed data gathered from 20 case studies identified by the federal CIO council and the Industry Advisory Council in a report of federal IT management "best practices." By this time, most of the SIM framework had been codified into public law and government wide policy (see the Information Technology and Management Reform Act [1996] and the amended Paperwork Reduction Act [1995]) and supporting government-wide policy (i.e., the revised OMB Circular No. A-130) [OMB, 1994].

The study, therefore, examined whether the case study agencies were following the new laws and related policy and whether the practices were as relevant to federal agencies as GAO asserted. The analysis of the case study data found strong support in practice for three of GAO's eleven practices and support for the remaining eight. In addition to finding support in practice for the GAO SIM framework, the study identified another practice (modified acquisition practices) that the study organizations found key to success but was not included in GAO work. This study helped to

ground this important work, initiated by a practitioner organization, in the public administration literature and also provide some much-needed external evaluation.

One recent addition to the literature covers an IT management project that is quite unique to the federal government: mega projects. Bozeman [2003] uses the Internal Revenue Service (IRS) Tax Systems Modernization (TSM) as an extended case study to explore the challenges of deploying desperately needed IT and business modernization on a scale not often seen. Bozeman analyzes the TSM case using the literatures of organizational culture and risk aversion. While some of these lessons are unique to the IRS, they may well prove instructive to federal agencies with risk adverse cultures seeking major systems and business process improvements.

There is also some state-level research that addresses the strategic role of IT in the public sector. Although the primary focus of the research is on strategic planning, Holley, Dufner, and Reed [2002] nonetheless build on the GAO studies of SIM to assess the extent to which state governments are managing information resources more strategically. The authors analyzed data from a Government Performance Project (GPP) survey gathered in 2000. For this study, the authors analyzed a subset of the GPP data that examined the processes and end results of strategic information systems planning in state governments. The authors concluded that, much like at the federal level, middle managers instead of top-level career and political appointees were involved in planning for IT implementation and the resulting plans were more tactical and inwardly focused than strategic and targeted at improving mission performance.

Garson [2006] addresses the policy, management, and implementation issues required for the success of a virtual state. One of the first chapters provides a brief history of public sector information policy that chronicles the evolution of federal IT policy since the 1940s. Garson labels the most recent phase the "virtual state," which places this work in the stage of IT management for the information age. The text points out how changing technology and public expectations have necessitated changes in public sector policy, management, and implementation of IT.

One final article rounded out the most recent stage of managing IT in an information age and addressed the issue of whether public sector investments in IT have and will yield the expected benefits of organizational transformation. Danzinger and Andersen [2002] analyzed empirical research published in journal articles between 1987 and 2000 to understand the impacts of IT on public administration and the public sector. They organized their findings into four broad groupings of impact and 22 specific impacts. While the "capabilities" grouping focused on traditional impact measures like efficiency and effectiveness, the other groupings examined impacts that might be considered more political, such as how the interactions among governments, citizens and stakeholders might change and whether "value distributions" might change as a result of public sector IT. The authors concluded that while positive impacts included improved efficiency and productivity, negative impacts of public sector IT included changes in public employee work environments and citizen's interactions with government. On the larger issue of whether IT had transformed the public sector, the authors concluded that the impacts substantial, but were not fundamental transformations.

14.2.4 Stage 4—Emerging New Models of IT Management and Public Interaction

As observers, providers, and end-users of government services, we likely now take for granted how integral IT has become to administering federal programs specifically and all public programs more generally. Government is an information-rich endeavor, so public administrators need to understand how to manage the infrastructure that collects, processes, stores, and disseminates

information about and for public program delivery. Recent developments in the public and private sectors make this issue even more pressing.

First, though, several publications from the business school world have started to raise the prospect of a new stage in IT management. Carr's [2003] polemic, "IT Doesn't Matter," in the *Harvard Business Review* (HBR), asked the question of whether investing in IT for strategic advantage was still advisable. A subsequent debate in the editorial pages of HBR, the trade press, and even the popular press probed Carr's article title, data, analyses, and conclusions. I used this article to help generate debate in my undergraduate and graduate management information systems courses between 2003 and 2006 and concluded that while the title was a bit disingenuous, it was still quite effective for provoking debate. What Carr said in his article, which is sometimes overlooked in the hyperbole over the title, is that while the underlying technology may no longer be the source of competitive advantage it once was, what really matters now is how organizations deploy and manage IT.

At about the same time, Peppard and Ward [2004] argued that organizations should be moving beyond identifying the "killer application" that will provide strategic advantage. Instead, the authors argue that organizations should be developing and sustaining an "information systems capability" that can be a source of continuous value. They assert this will be a fourth era of computing in organizations that recognizes the whole organization's performance will depend on IS capability instead of just a strategy of identifying a few select strategic applications. The resulting management focus should shift, in their view, to developing a full set of IS competencies and the success of this approach should be measured by the performance of the organization as a whole.

For public administration, there are some additions to the literature that suggest a shift in thinking and practice in the role of IT in the public sector. West [2005] examined some of the larger theoretical and practical issues associated with the series of studies he had conducted on adoption and deployment of e-government across federal agencies [West, 2001; West, 2003; West, 2004; and West, 2005]. Besides providing a theoretical underpinning to the wealth of empirical data he has gathered and analyzed through his e-government survey research, he offers up stage model that parallels several other e-government models of maturity [Hiller and Bélanger, 2001; Layne and Lee, 2001], which depict a fourth stage that envisions more citizen and end-user engagement with the public.

Beyond thinking about the prospects of using technology to enhance citizen participation, there is now some research on the complications of such projects at the federal level. Coglianese [2007] outlines the possibilities of using technology to increase public participation in the federal rulemaking process. In particular, he examines the e-Rulemaking program, part of President Bush's President's Management Agenda [Office of Management and Budget, 2002], in the context of political pluralism and questions how realistic it is to assume that technology alone will open up otherwise arcane policy making processes. Related research on adoption of information technology to increase citizen participation also finds little progress [Norris, 2005]. Despite these cautions to not oversell the potential for technology increasing citizen participation in governance, there is still a belief that technology can at least make the rulemaking process more transparent and open [Committee on the Status and Future of Federal e-Rulemaking, 2008].

The election of President Obama and his emphasis on an open and transparent federal government has brought a new sense of urgency to this issue. On his first full day in office, he signed a memorandum on this very subject [Obama, 2009] and listed the three key principles for his administration that government be transparent, collaborative, and participatory. What's particularly telling is that the memorandum calls for the Director of the Office of Management and

Budget and Administrator of General Services to work with the newly created Chief Technology Officer to write a new government directive on "open government."

At one level, it is not clear (and it may not matter) whether federal IT management is entering a fourth era. At another level, there are growing indications that whether public administration is ready or not, government and governance is changing and information technology is instrumental to that change. As noted above, there is some work underway that might help inform this ongoing change. Additionally, the National Academy of Public Administration has been very actively exploring the implications for Web 2.0 technologies (e.g., wikis, blogs, social networking) for federal agencies [Advisory Panel for the Collaboration Project, 2009]. The IBM Center for the Business of Government continues to support research in this area too [Chang and Kannan, 2008], but as often been the case as cited above, business school scholars seem to be conducting the research examining the intersection of new technologies and public organizations.

What seems clear is that public administration literature for managing IT continues to lag in practice and theory from other disciplines. The growing popularity and spending on electronic government, and this new emphasis on open and transparent government using technology, raises issues of whether public organizations lack a sufficient management infrastructure for building new internet-based form of information and service delivery. Possibly even more salient, the surge in online engagement in general and in politics in particular, as manifest in the election of President Obama, may have brought about a fundamental upward shift in the public's expectation for online engagement with the federal government [Smith, 2008].

The depth and rigor of public administration research in budgeting, personnel, and organization theory compared to scant literature on IT management points to a need to re-examine the core management competencies for public administration. Peppard and Ward [2004] argue this for the private sector and it likewise makes sense that management of IT should be viewed as a competency as important as the management of human and financial resources within public administration.

Public administration should provide a vision for federal agencies as they move from a technology base and management philosophy grounded in concepts of management information systems and information resources management to a more mature notion of an information age. This more mature notion should recognize that as IT becomes even more widely available and used by the public, citizens will demand changes in the way they interact with their governments. Increasingly, the public will ask, if not demand, to "do business" with the federal government electronically. As a result, it is imperative that IT management theory, policy, and practice mature more quickly to enable federal agencies to interact electronically with the public using the Web 2.0 tools being used for both business and personal use. It remains to be seen whether public administration will catch up and be relevant in what could be a renaissance of public administration in the information age.

References

Ackoff, R. (1967). Management misinformation systems. *Management Science*, 14, B147–156.

Adler, P. S., McDonald, W., & MacDonald, F. (1992). Strategic management of technical functions. *Sloan Management Review*, 33 (Winter), 19–37.

Advisory Panel for the Collaboration Project (2009). Enabling collaboration: Three priorities for the new administration. Washington, DC, National Academy of Public Administration.

Applegate, L. M., McFarlan, W. F., McKenney, J. L. (1999). *Corporate Information Systems Management: Text and Cases*. 5th ed. New York: Irwin McGraw-Hill.

Beachboard, J. C., & McClure, C. R. (1996). Managing federal information technology: Conflicting policies and competing philosophies. *Government Information Quarterly*, 13 (1), 15–34.

Bertot, J. C., McClure, C. R., Ryan, J., & Beachboard, J. C. (1996). Federal information resources management: Integrating information management and technology. In P. Hernon, C. R. McClure, & H. C. Relyea (Eds.), *Federal Information Policies in the 1990's: Views and Perspectives* (pp. 105–136). Norwood, NJ: Ablex.

Bishop, A., Doty, P., & McClure, C. R. (1989). Federal information resources management (IRM): A policy review and assessment. Paper presented at the 52nd Annual Meeting of the American Society for Information Science.

Bozeman, B., & Bretschneider, S. (1986). Public management information systems: Theory and prescription. *Public Administration Review*, 46 (Special Issue), 475–487.

Bozeman, B. (2003). Risk, reform and organizational culture: The case of IRS tax systems modernization. *International Public Management Journal*, 6 (2), 117–143.

Carr, N. G. (2003). IT doesn't matter. *Harvard Business Review*, 81 (5), 5–12.

Caudle, S. L. (1987). *Federal Information Resources Management: Bridging Vision and Action*. Washington, DC: National Academy of Public Administration.

Caudle, S. L. (1989). *Managing Information Resources: New Directions in State Government*. Syracuse: Syracuse University School of Information Studies.

Caudle, S.L., W. L. Gorr, & K. E. Newcomer. (1991). Key information systems management issues for the public sector. *MIS Quarterly* (June 1991), 171–188.

Caudle, S. L. (1996). Strategic information resources management: Fundamental practices. *Government Information Quarterly*, 13 (1), 83–97.

Chang, A.-M., & P. K. Kannan (2008). *Leveraging Web 2.0 in Government. E-Government/Technology*. Washington, DC, IBM Center for the Business of Government.

Coglianese, G. (2007). Weak democracy, strong information: The role of information technology in the rulemaking process. *Governance and Information Technology*. Eds., V. Mayer-Schoenberger and D. Lazer. Cambridge, MA, MIT Press: 101–122.

Committee on the Status and Future of Federal e-Rulemaking (2008). *Achieving the Potential: The Future of Federal e-Rulemaking*. Washington, DC, American Bar Association.

Danziger J.N., & Andersen, K.M. (2002). The impacts of information technology on public administration: An analysis of empirical research from the "Golden Age" of Transformation. *International Journal of Public Administration*, 25 (5), 591–627.

Dawes, S. S. (2008). The evolution and continuing challenges of e-governance. *Public Administration Review* 68(s1): S86–S102.

DeLisi, P. S. (1990). Lessons from the steel axe: Culture, technology, and organizational change. *Sloan Management Review*, 32 (Fall 1990), 83–93.

Dizard, W. P., Jr. (1985). *The Coming Information Age: An Overview of Technology, Economics, and Politics*. (1st ed.). White Plains, NY: Longman.

Dizard, W. P., Jr. (1989). *The Coming Information Age: An Overview of Technology, Economics, and Politics*. (3rd ed.). White Plains, NY: Longman.

Federal Property and Administrative Services Act (Brooks Act), 40 U.S.C. secs. 759 and 487 (1962).

Fletcher, P. D., & Bertot, J. (1993). The central information services function in county government. *Government Information Quarterly* 11 (1), 73–88.

Fountain, J. E. (2001). *Building the Virtual State: Information Technology and Institutional Change.* Washington, DC: Brookings Institution Press.

Garson, G. D. (2006). *Public Information Technology and E-Governance*. Sudbury, MA: Jones and Bartlett Publishers.

Government Accountability Office. (1994). *Improving Mission Performance Through Strategic Information Management and Technology* (GAO/AIMD-94-115). Washington, DC: Government Accountability Office.

Hax, A. C., & Majluf, N. S. (1984). *Strategic Management: An Integrative Perspective*. Englewood Cliffs, NJ: Prentice-Hall.

Hiller, J. S. and F. Bélanger (2001). Privacy strategies for electronic government. *E-Government 2001*. Eds., M. A. Abramson and G. E. Means. Lanham, MD, Rowman & Littlefield: 162–198.

Holden, S. H. (1994). Managing information technology in the federal government: New policies for an information age. Unpublished Doctoral dissertation, Virginia Polytechnic and State University, Blacksburg.

Holden, S. H. (1996). Managing information technology in the federal government: Assessing the development and application of Agency-Wide Policies. *Government Information Quarterly*, 13 (1), 65–82.

Holden, S. H. (2007). The evolution of information technology management at the federal level: Does IT finally matter? In *Modern Public Information Technology Systems: Issues and Challenges* (pp. 17–34), ed. G. David Garson. Hershey, PA: IGI Publishing.

Holden, S. H., & Hernon, P. (1996). An executive branch perspective on managing information resources. In P. Hernon, C. R. McClure, & H. C. Relyea (Eds.), *Federal Information Policies in the 1990's: Views and Perspectives* (pp. 96–100). Norwood, NJ: Ablex Publishing Corporation.

Information Technology and Management Reform Act of 1996 (Clinger–Cohen Act), 40 U.S.C. Chapter 25 (1996).

Holley, L. M., Dufner, D. & Reed, B. J. (2002). Got SISP? Strategic information systems planning in state governments. *Public Performance & Management Review,* 25 (4), 398–412.

Kraemer, K., & King, J. L. (2006). Information technology and administrative reform: Will e-government be different? *International Journal of Electronic Government Research*, 2 (1), 1–20.

International Business Machines. (1984). *Business Systems Planning Guide* (GE20-0527-4). Atlanta: International Business Machines, Inc.

Kraemer, K. L., & Dedrick, J. (1997). Computing and public organizations. *Journal of Public Administration and Theory*, 7 (1), 89–112.

Layne, K. and J. Lee (2001). Developing fully functional e-government: A four stage model. *Government Information Quarterly* 18(2): 122–136.

Levitan, K. B., & Dineen, J. (1986). Integrative aspects of information resources management (IRM). *Information Management Review*, 1 (4), 61–67.

Marchand, D. A. (1985). Information management: Strategies and tools in transition. *Information Management Review*, 1 (1), 27–34.

Marchand, D. A., & Kresslein, J. C. (1988). Information resources management and the public administrator. In J. Rabin & E. M. Jackowski (Eds.), *Handbook of Information Resources Management* (pp. 395–456). New York: Marcel Dekker.

Newcomer, K. E., & Caudle, S. L. (1991). Evaluating public sector information systems: More than meets the eye. *Public Administration Review*, 51, (September/October), 377–384.

Norris, D. F. (2005). Electronic democracy at the american grassroots. *International Journal of Electronic Government Research* 1(3): 1–14.

Northrop, A. (1990). Payoffs from computerization: Lessons over time. *Public Administration Review* 50, (September/October), 505–514.

Nutt, P. C., & Backoff, R. W. (1992). *Strategic Management of Public and Third Sector Organizations: A Handbook for Leaders*. San Francisco: Jossey-Bass.

Office of Management and Budget (2002). *E-Government Strategy: Simplified Delivery of Services to Citizens*. Washington, DC, Executive Office of the President.

Office of Management and Budget. (1994). *Management of Federal Information Resources, Transmittal 2, OMB Circular No. A-130*. (Federal Register Vol. 59, pp. 37906-37928). Washington, DC: U.S. Government Printing Office.

Obama, B. H. (2009). Memorandum on transparency and open government. White House. Washington, DC.

Office of Science and Technology Policy. (1993). *Technology for America's Economic Growth: A New Direction to Build Economic Strength*. Washington, DC: Office of Science and Technology Policy.

Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq* (1980).

Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq* (1995).

Partnership for Public Service and Gallup Consulting (2008). *In the Public We Trust: Renewing the Connection between the Federal Government and the Public*. Washington, DC, Partnership for Public Service.

Peppard, J., & Ward J. (2004) Beyond strategic information systems: Towards and IS capability. *Journal of Strategic Information Systems,* 13 (2), 167–194.

Plocher, D. (1996). The paperwork reduction act of 1995: A second chance for information resources management. *Government Information Quarterly*, 13 (1), 35–50.

Rabin, J., & Jackowski, E. M. (Eds.). (1988). *Handbook of Information Resource Management*. (Vol. 31). New York: Marcel Dekker.

Rocheleau, B. (2006). *Public Management Information Systems*. (Hershey, PA: Idea Group Publishing).

Smith, A. (2008). *Post-Election Voter Engagement*. Pew internet & American life project. Washington, DC, Pew Research Center.

Stevens, J. M., & McGowan, R. P. (1985). *Information Systems and Public Management*. New York: Praeger Publishing.

Strassman, P. A. (1990). *The Business Value of Computers: An Executive's Guide*. New Canaan, CT: Information Economics Press.

West, D. M. (2001). *State and Federal E-Government in the United States*. Retrieved April 20, 2002, from http://www.brown.edu/Departments/Taubman_Center/polreports/egovt01us.html.

West, D. M. (2003). *State and Federal E-Government in the United States, 2003*. Retrieved October 7, 2003, from http://www.insidepolitics.org/egovt03us.pdf.

West, D. M. (2004). *State and Federal E-Government in the United States, 2004*. Providence, RI, Center for Public Policy.

West, D. M. (2005). *Digital Government: Technology and Public Sector Performance*. Princeton, NJ, Princeton University Press.

West, D. M. (2005). State *and Federal E-Government in the United States, 2005*. Providence, RI, Taubman Center for Public Policy.

Westerback, L. K. (2000). Toward best practices for strategic information technology management. *Government Information Quarterly*, 17 (1), 27–42.

Zuboff, S. (1988). *In the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

Chapter 15

Electronic Data Sharing in Public Sector Agencies

Irvin B. Vann

CONTENTS

15.1 Introduction

All levels of government in the United States collect, store, analyze, and disseminate vast amounts of data, whether it is in paper or electronic form. Each government level and agency collects its own data so much that collecting redundant information has become synonymous with terms such as "red tape" and bureaucracy. Citizens and private sector businesses have frequently complained about the amount of redundant data collection. Complaints about redundant collecting have driven many efforts to gather and use data more efficiently.

In late 1970s and early 1980s, the federal government began to study the impact of collecting, storing, and processing data into information. By the 1980s and 1990s local, state, and federal government agencies acquired an enormous amount of information technology (IT) equipment. Public sector IT equipment was purchased with the intention to make paper processes more

efficient and to generate budget savings. Caudle [1990] noted that the 1980s was the decade of acquiring IT, and the 1990s was supposed to be the decade of information management.

In 1980, Congress passed the Paper Work Reduction Act in hopes of reducing the paperwork burden. Reducing the paper work burden and measuring it required information to be treated as a quantifiable and manageable resource [Paperwork Reduction Act of 1980, 1981]. One of the most frequently proposed techniques for efficiently managing information is sharing it so it will not have to be collected twice.

In the 1990s, the public sector mirrored the private sector by increasing its dependence on IT for business operations. Additionally, computing moved from a centralized to networked environment and was further enhanced by Internet connection. Moving from a centralized to network computing environment should have made data sharing easier. However, it is not evident that more sophisticated IT and more information management has affected the burden of collecting information from the public.

In the late 1990s and early 2000s, the e-government concept began emerging. When e-government emerged, it debuted as a new paradigm that would change the relationship of citizens to their government. However, Kraemer and Dedrick [1997] noted that research about computers and public organizations was slanted toward promoting computing rather than studying its impacts.

Implementing e-government was one of the major initiatives of the George W. Bush administration. In the 2003 Federal Budget, E-government was introduced as one of the five management priorities to make the federal government more efficient (FY–2003 Budget). One aspect of the initiative was to use information technology to "simplify and integrate processes across redundant and duplicative programs" [Program Performance Benefits from Major Information Technology Investments, p. 391].

This paper reviews electronic data sharing at the federal government level and two initiatives that use data sharing as part of achieving results. One initiative is electronic or e-government, which emerged along with network computing and the Internet. The other is protecting the United States using the Homeland Security concept. In each of these initiatives, improvement in technology and information management was supposed to usher in greater efficiency in government processes and reduce the burden of collecting data.

15.2 Paperwork Reduction and Information Sharing

In federal government, the Paperwork Reduction Act of 1980 (PRA) was the first legislation to treat data and information as a manageable resource and assign one agency to guide and monitor its use. Congress designated the Office of Management and Budget (OMB) to oversee information policy and created within it the Office of Information and Regulatory Affairs (ORIA) to assist in implementing the policies. The OMB was assigned oversight for general information policy, information collection, records management, privacy information, and automatic data processing (ADP) [Paperwork Reduction Act, 1980].

The PRA of 1980 also assigned general responsibilities to federal agencies. First, each one was required to conduct their information management activities efficiently and economically. Second, the agencies were not to collect information available through other government resources and they were required to "tabulate" information so that it could be available to other agencies [Paperwork Reduction Act, 1980]. One of the first measurable tasks in the PRA was to reduce the paperwork burden to 25% by October 1, 1983.

Between 1980 and 1995, IT changed from centralized automated data processing to decentralized networks. In 1995, Congress passed a new Paperwork Reduction Act and moved IT from a supporting to a central role in providing government services. The new Act insisted that agencies improve their mission performance by using IT [Government Accounting Office, 1994].

Since 1980, the paperwork reduction concept has rippled from federal to state government levels. Many state governments adopted similar paperwork reduction initiatives, also attempting to reduce the information collection burden on citizens. And like the federal government, the states looked to information technology to reduce the information collection burden by limiting redundancy and increasing sharing.

All levels of government invested heavily in IT. The increasing federal budget for IT is one indicator of explosive expansion. From 1982 to 1994, the federal government spent over $200 billion on information technology systems, or an average of $16.6 billion per year [GAO, 1994]. In 1996, the federal government allocated about $24 billion for information technology products and services [GAO, 1996]. In fiscal year 2002, the Bush administration proposed spending approximately $44 billion for IT services and systems [OMB, 2003]. In 2005, the budget for information technology and services was $60 billion. *By 2009, it was at an all time high of $72 billion (from 2003–2008).*

In 1996, Congress also passed the Clinger–Cohen Act to strengthen the Paperwork Reduction Act. The Clinger–Cohen Act elevated senior information managers in all federal agencies to chief information officers (CIOs) and placed them at the executive level. It also established the interagency CIO council and streamlined purchasing rules for new information technology systems. Information technology became a core element of managerial reform in public agencies and was viewed as a critical element for improving both managerial efficiency and the quality of services delivered [Ho, 2002].

One issue limiting the effectiveness of information technology is the "stand alone" nature of systems agencies developed in their acquisition phases. The OMB's associate director for information technology and e-government has noted that 20% of federal IT investment would be spent on redundant technology and services [Chabrow, 2003]. Scholars and practitioners have noted that data collected by public agencies often ends up in data "silos," isolated from other organizations and sometimes isolated from other departments within an agency [Industry Advisory Council, 2002].

The Bush administration contends that agency-centered IT initiatives limited the federal government's productivity gains and level of citizen service. One of the major objectives of the Bush administration's e-government strategy is to overcome the silo approach to implementing IT [OMB, 2002].

Despite significant expenditures in information technology, empirical research on its effect in public sector agencies has been limited [Lee and Perry, 2002; Kraemer and Dedrick, 1997; Rocheleau, 2000]. Early in the public sector technology expansion, Caudle [1986] proposed shifting from studying the impact of acquiring technology to studying information as a manageable resource. As Caudle [1986] proposed, studying information management across functional areas should become a major dimension of policy studies.

15.3 Public versus Private Information Systems

In public sector literature, a distinction has been made between the management of public and private sector information systems. The difference does not exist in the technology, per se, but in the application of it. Information systems in private sector companies exist to create a competitive

advantage for the company. Competitive advantage means finding customers first and creating demands for products or services. Additionally, competitive advantage includes enticing customers away from other companies and maximizing company profit.

In public agencies, information systems are designed to support service delivery to the broadest spectrum of customers. All citizens are potential customers of the public agency and the service must be available, sometimes independently of the demand. Other differences for public agencies include greater transparency, greater political accountability, and the need to consider a diverse range of public objectives rather than an empirically measurable "bottom line" of profits.

Early research exploring the differences between private and public sector organizations proposed different performance models for each type of information system. Mansour and Watson [1980] defined computer-based information system (CBIS) performance as a function of five groups of variables: hardware, software, organizational behavior, structure, and the environment. The environmental variables measured the products, customers, competition, and regulations. Their model explained information system performance in private sector companies very well [Mansour and Watson, 1980].

However, the model was not applied to the government agencies in the study. Mansour and Watson [1980] hypothesized that the environmental variables as they had defined them were not applicable to government agencies and excluded them in their model analysis. When the environmental variables were excluded, the remaining variables in the model were not significant in explaining the performance of government information systems [Mansour and Watson, 1980].

Differences in public and private information systems motivated Bozeman and Bretschneider [1986] to develop a new theoretical framework from existing management information system (MIS) literature. Rather than MIS, the new framework became public management information systems (PMIS). In the PMIS framework, the external variables, excluded by Mansour and Watson [1980], are redefined to address the differences between public and private organizations.

Bozeman and Bretschneider [1986] proposed that the environmental factors differentiating PMIS and MIS would extend from economic and political models of "publicness." Politically, public sector managers are open to the scrutiny of the citizens they serve as well as the influence of interest groups. Moreover, they operate in the absence of free market incentives for developing and implementing new information systems [Bozeman and Bretschneider, 1986].

Later, Bretschneider [1990] empirically tested the hypothesis of a distinction between the management of information systems in the public and private sector. Bretschneider [1990] determined that public and private sector information systems differed at the organizational level in their interdependence, level of "red tape," evaluation of hardware and software, planning, and, finally, the positioning of the MIS director within the organization.

Bretschneider [1990] found that public agencies were more interdependent and bound by more regulations or "red tape" in their business operations than their private-sector counterparts. Regarding the evaluation of hardware and software, public agencies were more focused on the "state of the art" than private sector companies. This is due in part to the longer budget cycles found in the public sector. Public sector agencies also had more formal planning processes than private agencies. Finally, the director of MIS in public sector agencies was likely to be in a lower organizational position than in private sector organizations [Bretschneider, 1990].

The Clinger–Cohen Act of 1996 addresses two of the differences Bretschneider [1990] discovered in the management of public and private information systems. First, the Clinger–Cohen Act changed the procurement of information technology from centralized to decentralized. Second, the MIS directors at the agency level were elevated to CIOs and made part of an agencies executive staff [Clinger–Cohen Act, 1996]. Even though it incorporates some private sector practices,

information systems management in public agencies remains functionally distinct from management in private companies.

15.4 Data Sharing Research

Public and private sector information systems have evolved through four generations: the experimental, the mainframe, microcomputer, and now the networking generation [Landsbergen and Wolken, 2001; Anderson and Dawes, 1991]. Each new generation in computing provides greater technical opportunity to work more efficiently by electronic data sharing.

Early in the technology expansion, the GAO highlighted how the lack of strategic vision, stand-alone systems, and scattered information limited the productivity of federal agencies [GAO, 1992]. Ten years later, GAO still notes the federal government does not have a strategic vision for information technology, builds stand-alone systems, and scatters information between agencies [GAO, 2002]. In a recent annual survey of CIOs, unifying automation islands across agencies was number five in a "top ten" list of technology challenges [Government Technology News, 2003].

Weiss [1987] observed that public agencies are frequently scolded for inefficiency, redundancy, and failure to cooperate in their operations. Sharing information is often recommended to agencies as a method to mitigate these problems. As computerized information technology became more prominent, electronic information sharing was proposed as a method to increase productivity, improve policy making, and integrate public services [Center for Technology in Government, 1999]. Landsbergen and Wolken [2001] noted that sharing data among public agencies generally improves effectiveness, efficiency, and responsiveness.

Just as information systems management is different between the public and private sector, data sharing has a different purpose too. Barrett and Konsynski [1982] proposed that interorganizational information systems developed for three economic reasons:

- Cost reductions
- Productivity improvements
- Product/market strategy

Public and private sector agencies are somewhat alike regarding the first two proposals, cost reductions and productivity improvements. As IT spread in government, cost reductions and productivity improvements have been frequently cited as the primary reason for the expansion. However, public and private sectors differ in their approach to the third proposal. The objectives for product/market strategy are not traditionally associated with government agencies. Although government may enter a new product/market area, it is usually the only or most able provider for that product or market area.

Often the terms "data" and "information" are used synonymously. However, they are different constructs. Miller et al. [2001] defined data as observable facts arranged and interpreted by a set of rules. A record in a database file is composed of observable facts or data arranged and interpreted by a set of rules. For example, a record might identify an individual as a white male, college educated, and earning a certain income.

Information, however, is the result of aggregating and interpreting a collection of data. In the previous example, the average or median salary of a collection of the white males is information as opposed to data.

Many of the suggestions for improving government efficiency use the term "information sharing." However, its data rather than information should be shared between agencies. Due to the fuzziness of the definitions, empirical research on electronic data sharing has been limited and is a significant gap in public administration literature. In spite of its importance, little is known about the factors underlying the propensity of an agency to share electronic data.

Some authors define data sharing broadly. Dawes [1996], for instance, defined data as program information documenting the nature, content, and operation of public programs. Her definition is not restricted to computerized data but includes paper and machine-readable data also. Data sharing for Dawes means exchanging or otherwise giving other executive agencies access to program information [Dawes, 1996].

Rocheleau [1996], in contrast, defined data sharing in more narrow terms as the exchange of an organization's information residing in its MIS. These data could include budgetary, personnel, information on clients, organizational activities, and other types of data that organizations maintain in their files. Sharing could range from the selective release of part of a database (extract) to total sharing of the database. Sharing files owned by an organization is different than sharing personal communications where individuals own the information being communicated [Rocheleau, 1996].

Rocheleau [1995], one of the few researchers who have investigated the correlates of data sharing, studied the rate of data sharing between police and other city departments in central Illinois. The highest rate of sharing was with the administrative and budget departments. His qualitative data suggest that a large proportion of sharing is due to factors such as hierarchical authority and accountability requirements, rather than the task-oriented reasons one would expect. Statistical analysis showed the use of electronic data exchange did encourage a higher overall rate of sharing between departments. Other variables, including hardware configurations, departmental size and autonomy, and crime-related variables, were not found to be significant [Rocheleau, 1995].

By reviewing the available literature, Rocheleau [1996] noted that much of the research on electronic communication focused on interpersonal communication rather than organizational communication. He identified factors easing information exchange between organizations as well as factors inhibiting information exchange. The factors easing the exchange were: common goals, technological compatibility, legal mandates, organizational survival needs, external incentives, symmetry of benefits, individual incentives, and top management interests. The factors impeding data sharing were: need for autonomy, database incompatibilities, privacy restrictions, limitations of computerized information, and asymmetry of benefits [Rocheleau, 1996]. Although Rocheleau [1996] identified nine hypotheses about public sector information sharing, they were developed from existing literature and have not been empirically confirmed.

Dawes [1996] studied the *attitudes* of public managers regarding data sharing in New York State. In her results she noted, "Though representing different agencies, eight in ten respondents judged information sharing to be moderately to highly beneficial" [Dawes, 1996, p. 391]. Dawes [1996] found that more experienced respondents were likely to recognize and endorse these benefits. Public managers in the study wanted a legal framework and formal policies to guide information sharing decisions and activities. They also want effective tools for "managing public data and for sharing it effectively" [Dawes, 1996, p. 391].

Dawes [1996] developed a data-sharing model incorporating an agency's experience in conjunction with the actual benefits and risks of a project. Public agencies begin data-sharing projects in response to a pressing problem. In a mutual project, each agency has preconceived expectations of the data-sharing experience. During a data-sharing project, agencies will add to their experience as well as create a set of expectations for similar projects in the future. If the benefits outweigh the

risks, the participating agencies will use the data sharing solution again. If the risks outweigh the benefits, the agencies will infrequently choose a data-sharing solution again [Dawes, 1996].

Building on research by Dawes [1996], Landsbergen and Wolken [2001] used case study methodology to conclude that the purely technical issues of computer hardware and software compatibility were receding in importance as impeding factors to data sharing. With many technical issues resolved, the focus should shift to issues of interoperability. Fundamentally, interoperability means data sharing, not technical compatibility [Landsbergen and Wolken, 2001].

15.5 Data Sharing Initiatives

15.5.1 E–Government

The "e-government" paradigm is a recent development in public management information systems (PMIS). Conceptually, e-government centers on government to citizen service delivery using Internet technology with the ultimate goal of providing services to citizens via one Internet portal or access point [Office of Management and Budget, 2002]. The technical aspects of accessing the service or conducting business across agency boundaries and databases remain invisible to the citizen. E-government also incorporates data exchanges between different levels of government as well as between government and business.

Layne and Lee [2001] proposed that e-government develops in four recognizable and progressively complex stages: cataloging, transaction, vertical integration, and finally, horizontal integration. Stages one and two are essentially data silos where citizens must access each agency Web sites to transact business with government. Stage three is the start of access at different levels but among functional lines. Stage four is achieved when the citizen uses one entry to access data and services across organizational boundaries.

The first, or cataloging stage, is the easiest stage to implement in terms of complexity and organizational commitment [Layne and Lee, 2001]. It consists of creating a Web presence and providing simple services like downloadable forms. Many government agencies have already achieved this stage of e-government and the informational Web site is now practically ubiquitous.

In the transaction stage, citizens are able to interact with one agency at a particular level of government [Layne and Lee, 2001]. Examples of stage two include renewing drivers' licenses online or filling out online forms and then submitting the data to the agency. Electronic transactions between citizens and government agencies are now very common.

Lane and Lee [2001] describe stage three or vertical integration as working at different levels within common functions. For example, a health and human services department at the state level is more likely to share data with its federal counterpart or even the health and human services in another state before it shares data with another function within its home state. Consequently, citizens may benefit from this vertical relationship by going to one Web site to interact with more than one level of government. Rocheleau [1996] hypothesized that data sharing is more likely when agencies share common functions.

The final stage of e-government is horizontal integration across the different functions of government. In this stage citizens use one portal to access all services. Layne and Lee [2001] noted that stage four has not been achieved yet; however, they cite two Web sites that incorporate some of the aspects of stage four. The two sites were developed under the "Access America" initiative. One is now called FirstGov for seniors and found at http://www.seniors.gov. The other is for

students and is located at http://www.students.gov. Each of the Web sites provides the capability to search a variety of databases at different levels of government for information.

At the organizational level, e-government can change the traditional bureaucratic paradigm from an agency-centric to a more citizen-centric focus [Ho, 2002]. One of the goals of e-government is achieving transparency in government operations. Achieving transparency involves abandoning bureaucratic command and control and embracing facilitation and coordination [Ho, 2002].

Without data sharing, transparency between agencies is not achievable. For citizens, this means continuing the status quo where communication is essentially with one agency at a time and the Internet and e-mail replaces the telephone and "snail mail" as a method of communication.

Besides the Layne and Lee model, Causey and Norris noted there are four other models seeking to explain development of e-government. They also noted that none of the five models explained how governments were going to advance from one level to the next. Their most intriguing observation is there is no empirical evidence to support any of the current models of e-government in public sector literature [Causey and Norris, 2008].

All of the models were proposed before any empirical studies were done. Although it is assumed data sharing is a contributor to e-government, it is hard to know how it contributes to any of the stages. If it does not contribute at some level, then e-government will remain in the silo stage it was supposed to eliminate.

15.5.2 Homeland Security

After September 2001, the federal government refocused itself on the issues of information sharing within law enforcement and national security channels. In its review of national preparedness, the GAO noted that intelligence, law enforcement, and response information are not effectively shared [GAO, 2002b]. The GAO also noted, like Dawes [1996], that the reasons for not sharing information includes stove piped organizational structures and "turf" issues [GAO, 2002b].

The GAO noted that before September 11, 2001, over 40 different agencies had some responsibility for combating terrorism without any formal structure for sharing information between them [GAO, 2001]. Solutions to improving information sharing among law enforcement, emergency management, and national intelligence encompass two general areas, managerial and technical. The technical issues of sharing data electronically are not the critical issue; it is the managerial issues. The most visible component of using managerial skills to guide the technical aspects was establishing the Department of Homeland Security (DHS).

One management-based approach that is showing promise to promote information sharing stems from Presidential Decision Directive (PDD) 63 issued by the Clinton administration in 1998. This directive outlined the critical infrastructure protection (CIP) program. The program establishes two different information-sharing entities, the National Infrastructure Protection Center (NIPC) and Information Sharing and Analysis Centers (ISAC).

The NIPC is the federal government's focal point and coordinating body in a crisis. In theory it is linked electronically to both the federal government as well as the ISACs. It is the only center the government has solely dedicated to sharing information between agencies as well as the private sector.

The ISACs are aligned with the critical infrastructures areas and serve as an information conduit. The critical infrastructure areas are: information and communication, banking and finance, water supply, transportation, emergency law enforcement, disaster services, public health, and power. These entities illustrate the difference between sharing information and sharing data. The centers receive "sanitized" information rather than data from the NIPC. They also submit information to the NIPC for analysis.

The system that developed closely resembles a centralized bureaucratic information system instead of a network. Two entities, the information owner and the NIPC program officer, control all information flow. Information submitted for this program goes through a process of submission, validation, and sharing. No entity is able to receive any of the Critical Infrastructure Information (CII) without accreditation. Ultimately, information cannot be shared without the explicit permission of the program officer and the original information owner [GAO, 2006].

It is interesting to note that it took less than a year—October 2004 to August 2005—for the CII electronic submission system to go from its initial start to fully operational form. However, by 2007, despite some initial successes the program was still coping with a variety of managerial issues. These issues included defining what data the program needed to collect, how the various entities will use the data, and whether the originator would retain control it [GAO, 2007].

15.6 Conclusion

Regardless of the medium, governments have always collected large amounts of data from its citizens. Collecting data became known as the collection burden, and "government paperwork" became synonymous with redundant inefficiency. Starting in the 1980s, all levels of government began acquiring information technology in an effort to make paper operations more efficient and eventually obsolete.

As the 21st century began, using networks and the Internet promised greater possibilities for data sharing between agencies. Enabled by new technologies and management philosophy, the George W. Bush administration wanted e-government to generate budgetary savings by improving operating efficiencies. With improvements in efficiencies, theoretically both the collection and tax burden on citizens could be reduced.

Even with leadership focus and capable technologies, data, as well as information sharing, are difficult to initiate and sustain. Discussions of either invoke issues of "turf," "bureaucracy," and "power" to justify why agencies do not share information [Dawes, 1996; GAO, 2002]. If turf and power were set aside, agencies may find basic issues such as standardized definitions still limiting their ability to share.

Within an agency, the practice of collecting data once and using it many times may be a workable solution. Due to unique agency missions, collecting data once and sharing across the agency boundary may not be possible because concept definitions are different.

One possible solution is to use Extensible Markup Language (XML) to map different concepts across agency boundaries. Extensible Markup Language (XML) uses standard "tags" that identify types of data. The "tags" function as a translator between different databases. For example, a standard tag such as <Name> could be used to link an individual's name across databases. Each agency would ensure that database fields corresponding to an individual name would be matched against the <Name> tag [GAO, 2002].

The original Paper Work Reduction Act and its successors require agency CIOs to certify information they are collecting is required and can be managed effectively and avoid duplication. However, a 2006 study by the Government Accounting Office (GAO) found that CIO review was not stringent or sufficient to reduce the information collection burden [GAO, 2006].

Interestingly enough, technology has been proposed as the solution for reducing the information collection burden. However, by fiscal year 2009 expenditures for IT and services were at an all-time high of $72 billion and the collection burden was higher than previous years [GAO,

2006]. As Landsbergen and Wolken noted, "Data sharing implies a richer set of political, organizational, and economic issues" [Landsbergen and Wolken, 2001, p. 212]. Although all of the correlates of data sharing are not known, it is becoming apparent that ultimately there is a human managerial element to making data sharing workable.

References

Andersen, David F. and Dawes, Sharon S. (1991). *Government information management.* Englewood Cliffs, NJ: Prentice-Hall.

Bozeman, Barry and Bretschneider, Stuart (1986). Public management information systems: Theory and prescription. *Public Administration Review, (46)*

Bretschneider, Stuart (1990). Management information systems in public and private organizations: An empirical test. *Public Administration Review, (50),* 536–545.

Center for Technology in Government (1999). *Research and practical experiences in the use of multiple data sources for enterprise level planning and decision making: A literature review.* Albany, NY: University at Albany/SUNY.

Caudle, Sharon L., Marchard, Donald A., Bretschneider, Stuart I., Fletcher, Patricia T., & Thurmaier, Kurt M. (1989). *Managing information resources: New directions in state government—A national study of state government information resources management.* Syracuse, NY: School of Information Studies. Syracuse University.

Dawes, Sharon S. (1996). Interagency information sharing: Expected benefits, manageable risks. *Journal of Policy Analysis & Management*, Vol. 15 Issue 3.

Government Accounting Office (1992). *Information management and technology issues.* (GAO/OCG-93-5TR). Washington, DC: U.S. Government Printing Office.

Government Accounting Office (1993). *Federal health care. Increased information system sharing could improve service, reduce costs* (GAO/IMTEC-93-33BR). Washington, DC: U.S. Government Printing Office.

Government Accounting Office (1994). *Executive guide: Improving mission performance through strategic information management and technology: Learning from leading organizations.* Washington, DC: U.S. Government Printing Office.

Government Accounting Office (1996). *Information management reform: Effective implementation is essential for improving federal performance.* (GAO/T-AIMD-96-132). Washington, DC: U.S. Government Printing Office.

Government Accounting Office (1997). *Information management and technology*. (GAO/HR-97–7). Washington, DC: U.S. Government Printing Office.

Government Accounting Office (2000). *Critical infrastructure protection: Challenges to building a comprehensive strategy for information sharing and coordination.* (GAO/T-AIMD-00-268) Washington, DC: U.S. Government Printing Office.

Government Accounting Office (2001). *Combating terrorism: Selected challenges and related recommendations* (GAO-01-822). Washington, DC: U.S. Government Printing Office.

Government Accounting Office (2002a). *Information resources management: Comprehensive strategic plan needed to address mounting changes.* (GAO-02–292). Washington, DC: U.S. Government Printing Office.

Government Accounting Office (2002b). *National preparedness: Integrating new and existing technology and information sharing into an effective homeland security strategy*. (GAO-02-218-811T). Washington, DC: U.S. Government Printing Office.

Government Accounting Office (2006). *Increase in estimated burden hours highlights need for new approach.* (GAO-06-974T). Washington, DC: U.S. Government Printing Office.

Government Accounting Office (2007). *Critical infrastructure: Challenges remain in protecting key sectors* (GAO-07-626T).

Ho, Alfred Tat-Kei (2002). Reinventing local government and the e-government initiative. *Public Administration Review 62*(4), 434–443.

Industry Advisory Council (2002). Cross-jurisdictional e-government implementations. Accessed October 12, 2002 at http://www.iaconline.org/

Landsbergen, David Jr. and Wolken, George Jr. (2001). Realizing the promise: Government information systems and the fourth generation of information technology. *Public Administration Review (61),* 206–220.

Layne, Karen and Lee, Jungwoo (2001). Developing fully functional e-government: A four-stage model. *Government Information Quarterly, 18,* 122–136.

Lee, Guenjoo and Perry, James L. (2002). Are computers boosting productivity: A test of the paradox in state governments. *Journal of Public Administration and Theory 12(1),* 77–102.

Mansour, Ali and Watson, Hugh J. (1980). The determinants of computer-based information systems performance. *Academy of Management Review, 23,* 521–533.

Miller, Bob; Malloy, Mary Ann, Masek, Ed and Wild, Chris (2001). Towards a framework for managing the information environment. *Information Knowledge Systems Management, 2,* 359–384.

Morin, Arthur L. (1994). Regulating the flow of data: OMB and the control of government information. *Public Administration Review, 54,* 434–443.

National Association of State Information Resource Executives (NASIRE) (2000, February). *National Information Architecture: Toward Sharing of Governmental Information*. Lexington, KY: National Association of State Information Resource Executives.

Office of Management and Budget. (2002). E-government strategy. Retrieved October 16, 2002 from http://www.whitehouse.gov/omb/inforeg/egovstrategy.pdf.

Office of Management and Budget. (2003) *Analytical Perspectives, Budget of the United States Government fiscal year 2003; Investments in Information Technology.* Washington, DC: U.S. Government Printing Office.

Paperwork Reduction Act of 1980, PL 96–511, 94 Stat 2812 (1981). *US Statutes at Large* vol. 94 pt. 3 Washington, DC: U.S. Government Printing Office.

Rocheleau, Bruce. (1996). Interorganizational and interdepartmental information sharing. In G. David Garson and Stuart S. Nagel, (Eds.) *Advances in social science and computers*, JAI Press, Vol. 4, 183–204.

Rocheleau, Bruce (2000). Prescriptions for public sector management: A review, analysis, and critique. *American Review of Public Administration,* 30*,* 414–435.

What keeps federal CIOs up at night? (2003, November 21). *Government Technology News.* Accessed on November 30th at http://www.govtech.net.

Weiss, Janet A. (1987). Pathways to cooperation among public agencies. *Journal of Policy Analysis and Management,(7)* 1, 94–117.

Chapter 16

Time and Technology: Addressing Changing Demands

Douglas Carr

CONTENTS

16.1 Introduction

Throughout history, policymakers have struggled in adapting to the consequences of technological change. We attempt to understand the world through our current perceptions of reality; this practice is particularly dangerous given the rapid pace of technological change today. We no longer have the luxury of time to adjust as the world changes in response to policy decisions. Policy choices are no longer responsible for much of the rapid change in society; rather, technological changes external to government are transforming the world at an increasing rate [Wriston 1988]. The public sector must operate in this rapidly changing technical environment, addressing the accompanying new demands and challenges. This chapter explores these challenges, paying particular attention to the financial and organizational demands of changes in technology.

16.2 Changing Technology in the Public Sector

Technology is rapidly changing, bringing about new possibilities in the public sector. For example, consider the enhanced prison security that has become possible through the application of technology. Tracking bracelets worn by inmates can be used to create a record of times and locations for each prisoner. This can be used to investigate assault claims in the prison, and alarms can be triggered if an inmate approaches a forbidden area [Evans and Yen 2006]. Such applications of technology in the public sector enable service improvements, which would be difficult to attain without the use of new technologies.

Technology available to the public sector is rapidly changing. These rapid technological changes can be characterized as increases in the scope of technology use or as the replacement of existing technological solutions with new ones. While the application of a particular technology may both replace an existing system and increase the scope of technology use, these two dimensions of technology change are helpful for understanding the types of change faced by the public sector. By considering these two aspects of public sector technological change, expansion of scope and replacement of existing systems, the nature of these changes can be better understood.

16.2.1 The Nature of Changing Technology

Existing technical solutions are not static; public agencies face continually changing hardware, software, and networking standards. When a particular system is adopted by an agency, the agency is making an implicit commitment of future resources for maintenance and updates. As new software becomes available, hardware must be replaced to meet the minimum requirement of the software. Network security is vital, requiring adequate staffing and continual maintenance of network hardware and software. Thus, maintenance and replacement of existing systems add to an agency's technology costs.

Beyond the opportunities and costs of technological upgrades, the rapid technological change itself presents new challenges to public agencies. The scope of technological implementation in the public sector has been expanding rapidly. Expanded information technology has been called the next frontier for government improvement [Li 2003]. Improvements sought via technology include efficiency gains, increased effectiveness, cost savings, and greater responsiveness and convenience for the public. Dawes [2008] characterizes the results of this pursuit over the past couple decades. Before the 1990s, mainframe information systems exemplified extensive technology implementation in the public sector. The early 1990s saw the use of desktop computers connected to local

networks to increase administrative efficiency and effectiveness. By the mid-1990s, commercial Internet connections were available and e-mail was becoming a standard form of communication; this provided the framework for a great shift in how many residents interacted with the public sector. In the late 1990s, mobile computing began to significantly expand the possibilities for data access and management far beyond the limitations of mainframe systems. Network security also became a growing concern, requiring additional resource commitments. Since 2000, applications of Web 2.0, allowing users to create and modify content on external Web sites, have brought new opportunities and challenges for citizen interaction with the public sector. In a relatively brief period, the scope of technology in the public sector has greatly expanded.

Governments have turned to the Internet for communicating and providing services to residents. Typically, such initiatives are progressive in nature, gradually expanding the scope of Internet use; initial emphasis is often on providing information, while more complete technological integration enables online transactions and integration of services across agencies and levels of government [West 2004, Gil-Garcia and Martinez-Moyano 2007]. Advanced online integration creates opportunities for enhanced service delivery and potential cost savings; these expansions in the scope of technology implementation also may pose significant internal management challenges, which will be discussed in the next section.

16.2.2 Demands on Financial Resources

The adoption of rapidly changing technology clearly has fiscal implications for the public sector. The procurement and implementation of new systems can be very costly, and the maintenance costs of existing systems can also be significant. However, it is not necessary that these costs impose a burden on the budget. New systems can be designed that improve efficiency and reduce costs, resulting in net savings. A report from the Center for Digital Government identifies three broad strategies for leveraging technology to reduce budgetary pressures. Systems can be designed to help governments collect a greater portion of taxes and fees owed and pay only what the government owes, project financing can be developed in cooperation with third parties to reduce or eliminate upfront investment costs, and processes can be streamlined or automated to improve efficiency [Center for Digital Government 2003].

While technology implementation can save money, cost savings are often absent from public sector projects. The technology adoption process in the public sector often divorces productivity improvement from changes in technology [Feller 1980]. Saving money is often not a guiding motivation for technology implementation. In fact, technology adoption decisions are typically not driven by economic or political concerns or current technological and fiscal capacity. Rather, these decisions are internally driven by a small group of managers [Ho and Ni 2004].

Agency managers responsible for technology adoption decisions have reasons to value service augmentation over cost savings. Bureaucrats are concerned with organizational survival. Enhancing current services can expand a department, increasing budget allocations and improving the survival outlook for the department. Also, clients benefiting from the enhanced services will provide political support for the department [Feller 1980, Yin 1977].

It is important to note that service augmentation does not necessarily preclude cost savings. However, bureaucrats are not the only ones less concerned with cost savings. Voters typically are not concerned with the cost savings associated with particular projects. The per capita cost savings or increases from a project are likely small, while the effort required for residents to become informed and lobby for efficiency improvements is large. Thus, except for gross inefficiencies, cost savings from efficiency gains are not a political consideration for agencies [McKean 1972, Feller 1980].

Electronic benefits transfer (EBT) programs, as described by Pirog and Johnson [2008], provide an example of the importance of improving services when considering the adoption of new technologies. EBT programs provide recipients with a pre-loaded card similar to a debit card; these programs often replace paper-based benefits such as food stamps. The use of EBT enhances service provision from the perspective of both the issuing government and the recipient. With EBT, benefits are more likely to be used for their intended purpose rather than be diverted to stamp trafficking. Administrative costs, including printing, distributing, and redeeming paper coupons, are reduced. Clients benefit from reduced stigma, quicker transactions, and greater security through PIN protection. While EBT programs enhance services, they do not always produce cost savings. Some states have seen reductions in per-recipient costs, while these costs have risen in other states [Pirog and Johnson 2008, Stegman et al. 2003].

Financial demands are not only created by new projects aimed at enhancing services. Maintenance and upgrades of existing systems can present significant budget demands. A particular financial hazard with existing systems is vendor lock in [Simon 2005, Scholl 2006]. When proprietary software is adopted, the publisher of that software typically has a monopoly on upgrades and license expansions. Also, the software publisher may be the only source for customizations of the software to match agency procedures. Thus, while the initial cost of the software may appear low, the total cost of ownership could rise significantly as the software is customized or upgraded over time. In general, adoption costs for a particular system are not fixed at the time of adoption, but increase through the life cycle of the adopted system. Vendor lock-in increases the risk of high future costs.

16.2.3 Demands on Organizational Culture

While cost considerations for technology adoption decisions often focus on financial costs, other organizational costs may, in fact, prove to be more important. The adoption and implementation of new technology can have significant impacts on organizational culture. These impacts can, in turn, affect agency effectiveness and efficiency.

New technology projects must compete for scarce funding, potentially threatening existing budgets. Stakeholders have identified finance tradeoffs as a major barrier to e-government initiatives [Li 2003]. If a decision to fund a new technology project will necessitate budget reductions elsewhere, the employees affected by the resulting budget cuts will likely oppose the new technology adoption. Thus, an adoption decision itself has the potential to disrupt an organization.

When new information technology (IT) systems are implemented, work flow processes are often altered. While these changes may be designed to improve agency efficiency or effectiveness, they are not always welcomed by employees. Changes in job descriptions or work practices may be seen as undesirable by staff who prefer current working conditions or are uncomfortable with potential new assignments. For example, some IT managers did not welcome the adoption of microcomputers in the early 1980s because of job security and job definition concerns [Rocheleau 1985]. When asked how they had responded to requests for microcomputers, these concerns were apparent in replies such as, "Start rumors about serious radiation leaks from micros," "Tell them to forget about it," and "Refuse to acknowledge that micros exist" [Thiel 1984].

The presence of employee unions can slow the process of altering job descriptions, which are agreed on through collective bargaining [Li 2003]. This in turn can delay the implementation of a new IT system. Public managers, especially in the context of employee unions, should not underestimate the importance of stakeholder support.

16.3 Responding to Challenges

The adoption and implementation of technology in the public sector creates a variety of challenges. If not appropriately addressed, these challenges can lead to failed projects and missed opportunities for improvements in agency efficiency and effectiveness. The following sections address specific issues facing public managers. These challenges largely cannot be avoided; rapid changes in technology force these issues to the table.

16.3.1 Client Expectations

Often, new IT systems are designed to improve service delivery. The recipients of these services are an important stakeholder group, who care about service quality. This group is a potential source for political opposition or support for technology projects. Viewing these stakeholders as clients allows managers to explicitly account for their interests. Such consideration is important on the part of public agencies to maintain democratic governance.

While client interests are important, they should not be the sole driving force behind technology adoption and implementation. Just as public managers may represent relatively narrow interests, so can the recipients of a particular service. In practice, the political landscape will affect the influence of client preferences.

Constituency pressures do not necessarily drive technology adoption decisions. Ho and Ni [2004] find that technology adoption is not the result of pressure from clients, likely because early adoption decisions precede public demand. When constituents are unaware of the technological possibilities, they will not pressure for the adoption of new technologies. As constituents become accustomed to private-sector technological conveniences, such as paying bills online, client pressures on the public sector can be expected to increase. Thus, the influence of client expectations on technology adoption in the public sector will be stronger for established technologies.

Local governments can expect to see greater influence from residents than state or federal agencies. This is the case because local governments are closer to the people, resulting in greater responsiveness to public expectations [Gil-Garcia and Martinez-Moyano 2007]. Thus, client expectations will likely have the strongest influence regarding the adoption of established technologies by local governments.

It is not only the scope of technology implementation that concerns the public. There is growing public attention to privacy safeguards. Many public systems contain personal data, and adequate security for these systems is important to the public [Benton et al. 2007]. Security breaches resulting in the loss of personal data can result in significant political consequences for a public agency.

It is important to note that while client expectations communicate important stakeholder interests, these interests can be relatively narrow. Public officials responsible for technology adoption must balance these interests with other agency objectives. For example, while developing an online tax payment system may provide considerable convenience to many residents, implementing such a system may require budgetary cuts in other areas. Public officials may be making difficult choices between implementing a new IT system and repairing streets.

16.3.2 Redefining Jobs

The public is not the only stakeholder group public officials should consider when implementing new technologies. Internal organizational dynamics will significantly influence implementation success. Because new technologies affect organizational culture through changes in job

descriptions and work practices, employees will be concerned with the internal implications of new technology or IT systems. Also, relationships within the organization could be altered, affecting reporting hierarchies and horizontal relationships as staff is reassigned to new roles. Employee opposition can be a significant barrier to implementation; those using the new system can hinder or delay its successful implementation if they are not supportive [Ho and Ni 2004]. Thus, public managers must look beyond the efficiency or effectiveness impacts of a project and also consider the internal organizational effects.

As previously discussed, collective bargaining can slow down the process of changing job descriptions to fit the new roles required by a new technology or IT system. Even in the absence of employee unions, changes in job descriptions can bring significant organizational impacts. Often these changes will involve the addition of technical activities. For example, clerical employees are now often required to use spreadsheets or develop databases. When job descriptions are changed to include more technical skills, there will be employee pressure for job reclassification at higher pay levels. If these salaries are not raised, a public agency can expect to experience lower retention and more difficulty recruiting and hiring qualified staff. Public agencies are in competition with the private sector for qualified employees; public agencies must offer competitive compensation in order to attract and retain employees. This is a hidden, yet very real financial cost of technological change.

Li [2003] identifies a variety of strategies public agencies can employ to address employee concerns and build organizational support for new technology or IT systems. Public officials should manage employee expectations; positive and realistic expectations will go a long way toward building support. It is also important that expectations are compatible across departments; incompatible expectations will lead to frustrations during implementation [de Abreu and Conrath 1993]. Effective communication and training, which will be discussed in the next section, is also an important strategy for managing stakeholder expectations. Employees who believe in the benefits of the project and who are not disappointed by the implementation process will be less frustrated and more supportive. Also, implementation of a new system requires more than technical expertise; support of agency management is important for all affected departments, not just the IT department.

Plans addressing the challenges of organizational change resulting from changing technology should look beyond managers and consider lower-level staff concerns. Because governments tend to decentralize IT control to lower level managers and staff, the support of these employees is critical [Ho and Ni 2004]. When staff concerns regarding workload and changes in procedures are addressed, resistance to new systems can be reduced; this is an important step in promoting agency effectiveness.

An incremental approach to implementation of a new technology or system can help build organizational support. Providing a series of rapid successes will build employee acceptance, addressing employee fears of unknown organizational consequences that could result from a single, major initiative [Li 2003].

16.3.3 Training Implications

Appropriate training is an important component of responding to the demands on organizational culture resulting from changing technology. Training can achieve two important tasks: providing technical competency and improving stakeholder acceptance. First, effective implementation of a new technology or IT system requires that users possess the ability to perform required tasks. If an agency fails to make provision for giving employees the requisite skills to

use a new system, the effectiveness and efficiency of the new system will be reduced. Also, if employees do not possess sufficient technical competency, they will easily become frustrated with the tasks they are required to perform. Such frustrations will likely be targeted at the new system, generating substantial internal opposition to the new system. On the other hand, when employees are provided with sufficient and appropriate training, they will be more likely to be supportive of the new system. Replacing potential frustrations with the ability to achieve increased efficiency can greatly improve employee expectations and experiences with a new system.

Rocheleau [2006] explores the variety of training options available to public managers. While hiring external training consultants or sending employees to external training workshops can be valuable to agencies that do not have the resources to provide in-house training, this option can be quite costly. Seminars provided by agency staff are less expensive, although attendance is often a struggle. Agency employees may not have time to attend workshops because of immediate project deadlines. Workshops provided during lunch breaks have been used to address this problem. Use of online training is also growing, providing a relatively inexpensive way for employees to learn at their own pace. However, online tutorials do not permit spontaneous questions seeking clarification or further instruction on specific tasks.

When planning to meet training needs, public agencies should design an appropriate mix of training formats that meets their needs; each of the above training formats has advantages and limitations. However, it is important to look beyond these formal training options. Informal learning is an effective training tool [Wu and Rocheleau 2001, Rocheleau 2006]. Informal learning occurs as employees help each other, often providing timely answers to specific questions regarding current tasks. Wu and Rocheleau [2001] observe that end users find help from peers to be more effective than formal training options.

Intentional reliance on informal training can impact both budgets and organizational culture. Informal learning prevents costs associated with formal training seminars, but it could also have more subtle impacts on agency efficiency. While users receiving informal assistance from peers will likely experience greater work efficiency, staff providing the informal training are distracted from their regular tasks. If managers want to relay on informal learning, it is important that the "gurus" providing their peers with spontaneous training are not penalized; for example, project assignments could be adjusted to account for the time an employee will spend helping coworkers [Rocheleau 2006].

In general, effective training will not only improve efficiency, but will also benefit organizational culture. Employees who are less frustrated with the technology they use will be more supportive of operating procedures and less resistant to technology change.

16.4 Planning for Technology Changes

The ability to effectively respond to the challenges arising from technology change is rooted in appropriate planning. While the details of future technological developments may be unknown, it is no surprise that technology will continue to change rapidly. Public officials should anticipate future demands that will result from changing technology. Information technology plans should then be developed that both meet current demands while maintaining the capacity to meet anticipated future demands. Furthermore, public managers should be careful to engage in evaluation of new technologies before the projects take on a life of their own, limiting the ability of public officials to modify the implementation of new systems.

16.4.1 Adequate Planning: Anticipating Future Demands

Information technology planning enables public agencies to anticipate the challenges that will arise from rapid changes in technology. By planning for these future challenges, managers have the opportunity to take steps, today, that will reduce future barriers to agency effectiveness and efficiency. Public agencies have been faced with rapid developments in technology for some time; the success and failure of previous projects can be used to identify the future consequences of technology decisions.

Ni and Ho [2005] explore the lessons that can be learned from public kiosk systems. The 1990s saw the expansion of electronic kiosks, typically aimed at providing information to those without immediate computer access. Kiosks can be designed to target tourists, and they have been used to address the digital divide by providing electronic access to those without a computer. Ni and Ho discuss the importance of strategic planning, collaboration with stakeholders, and designing sustainable projects. Without adequate attention to these aspects of planning, projects such as kiosk systems have limited effectiveness and longevity.

First, it is important that agencies develop a strategic plan that is consistent with the agency's mission [Ni and Ho 2005]. By explicitly incorporating the mission of the agency into the planning process, agencies are less likely to find themselves immersed in a project that is draining agency resources without contributing to the purpose of the agency. Technology should be used as a tool toward achieving a mission; when technology decisions are not rooted in agency goals, an agency will begin to serve the technology instead of the technology serving the agency.

Collaboration with stakeholders is also important. Many of the impacts a project could have on organizational culture can be identified by affected stakeholders. Technology adoption in public agencies tends to be controlled by a small group of managers [Ho and Ni 2004]. While this can simplify the adoption process by limiting the stakeholders involved, it may ignore important interests. Technology implementation tends to be controlled by those responsible for its adoption; when a small group representing relatively narrow interests is guiding the implementation process, broader constituency interests may be missed. Thus, intentionally incorporating the involvement of a broader group of stakeholders is important for effective implementation [Lambright 1972].

Important stakeholders include end users, IT units, partnering agencies, and community groups [Ni and Ho 2005]. End users within the agency should be consulted to ensure those designing a new IT system understand how the system will be used. The IT department or units that will be responsible for implementation and maintenance should be involved in adoption decisions, as they will be able to identify the technical implications of adopting a particular system or technology. For example, transitioning to an off-site e-mail server may require the organization to upgrade their internet connection. Collaboration with partnering agencies is important, especially when multiple agencies will be contributing resources toward a project. Without this collaboration, insufficient or duplicate resources may be allocated to the project. Finally, community groups may represent key stakeholder interests. As previously discussed, client expectations have the potential to influence the implementation of a project. By anticipating future client pressures, an agency can prevent costly project changes after implementation.

Long-term planning is important to ensuring projects are sustainable. Financial planning must extend beyond the initial startup costs. Grants can make projects appear inexpensive to an agency if long-term costs are not adequately considered. Even after the initial purchase of hardware or software, continuing operation and maintenance costs can be substantial; throughout the full life cycle of an IT system, hardware will need to be maintained and potentially upgraded and software may need modification. Available resources should be evaluated; in addition to startup grants that

may be available, the financial and personnel resources to meet requirements for continued operation should be identified [Ni and Ho 2005].

Such financial planning can influence project design. For example, Ni and Ho [2005] discuss the implications of the kiosk system initially built for the Atlanta Olympics. This system had limited upgradability, which made the initial hardware acquisition less costly but also limited the long-term use of the system. Long-term planning for this system likely would have resulted in a different initial hardware design.

16.4.2 Adequate Planning: Meeting Current Demands

Once the planning process has allowed an agency to anticipate future demands, current demands can be addressed. It is important to start the planning process by incorporating procedures that will anticipate future demands; if this is not done, then current plans will likely make future problems worse. This is because procurement, implementation, and training decisions, today, will affect future agency resources and organizational culture.

Future financial and technical resources are in part determined by current technology decisions. Maintenance and operation costs will continue throughout the life of a project, and these costs could limit an agency's spending on other projects if they are significantly high. Future technical resources available to a public agency are dependent on past technology decisions. A project that fails to perform efficiently or effectively because of poor long-term planning will be of less benefit to the agency, as will an inadequately customized implementation of a system that fails to fit with established agency procedures. Also, organizational culture is greatly influenced by the implementation of changing technology; decisions to adopt particular technical systems will result in organizational consequences that can extend beyond the life of a single system.

The rapid changes in technology often produce frequent technology-oriented projects. These frequent projects will often have a life span of a number of years, providing sustained benefits from project costs. Capital budgeting provides one tool for ensuring procurement decisions do not unnecessarily hinder future ability to invest in other systems [Robbins and Miller 2008].

Adopting open standards solutions can also limit the financial impacts of frequent advances in technology. Open source software is often less costly to adopt than commercial off the shelf (COTS) software. Maintenance is typically not limited to a single vendor, avoiding the previously discussed problems associated with vendor lock-in [Simon 2005, Scholl 2006]. Also, the restrictions of COTS enterprise resource management (ERP) software may require alterations in business practice. This may create legal problems [Scholl 2006], alter service quality, or affect process efficiency. Greater process flexibility may be possible through customizations of open source systems. Open source is not a panacea, however; agencies should develop a sourcing strategy with their organizational long-term goals in mind [Scholl 2006].

In general, technology plans should be developed around agency objectives, performance measurement, and post implementation audits [Harris 2004]. Agency objectives should always guide technology decisions, resulting in technology projects that are investments toward accomplishing the agency mission. Performance monitoring should also be included in the planning process, allowing managers to establish a baseline from which to measure progress. Not all problems can be anticipated, and it is important to catch problems as they arise. Efficiency and effectiveness should be monitored throughout the life of the project, enabling an agency to modify, replace, or cancel a particular project before the costs of unanticipated problems become too great. Finally, audits allow an agency to know whether objectives have been met. This feedback is helpful when making future implementation decisions, preventing repetition of past mistakes.

16.4.3 Timing and Control

Even when an agency engages in detailed planning, technology projects can take on a life of their own. Public officials are not always able to exercise full control over projects, potentially limiting the effectiveness of the planning process. Gil-Garcia and Martinez-Moyano (2007) explore the reasons this may occur.

Because local governments are closest to the people, it is expected that they will be more responsive and accountable. Thus, stakeholders will typically have greater ability to influence public officials at the local level than at the national level. Applying these concepts to technology, technological implementation at the national level is expected to be more insulated from public pressure. It will be more driven by internal strategies designed to address needs as perceived by public officials. Technological implementation at the local level, however, will be more driven by client expectations.

There are unique advantages to each situation. Technology decisions driven by internal priorities will reflect the agency mission and available resources. However, greater political accountability results from decisions that are responsive to client expectations. Gil-Garcia and Martinez-Moyano relate this tension to the classic politics and administration dilemma [Wilson 1887].

Public officials must deal with this dilemma when managing technology projects. Initially technology projects are under the control of public managers. However, this locus of control is temporary, especially for public agencies that have greater interaction with the public. After a project receives extensive use by the public, control over the project will shift away from public managers and toward the public. Gil-Garcia and Martinez-Moyano use the example of an online driver's license renewal system to explain this phenomenon. Initial use of the renewal system will be low, during which time managers can easily alter or terminate the program. However, use of the system will increase with time. Once the renewal system has reached significant use, characterized by either a large number of people using a system or a few people intensively using a system, terminating the program would be politically difficult. Significant stakeholder opposition would exist to such a loss in convenience by the public; such opposition may exist even in the presence of substantial system inefficiencies.

These observations have direct implications for the planning process. Local agencies, or state or federal agencies with extensive interaction with the public, will find it increasingly difficult to control technology projects once they have been implemented. Responsiveness to client expectations can be beneficial if the particular technology in question is efficient, effective, and sustainable. However, projects that do not satisfy these criteria should be modified or canceled. Public officials must make this evaluation before a technology project becomes widely used by the public and takes on a life of its own. Therefore, technology evaluation must occur early in the life of a project. Adequate planning is essential for this to be possible. Otherwise, an agency can find that it is trapped into continuing to use a technology that will result in significant financial costs and negative impacts on organizational culture.

16.5 Conclusion

Technology in the public sector is rapidly changing. These changes create significant demands on financial resources and organizational culture. Planning for the consequences of financial pressures and organizational change resulting from changing technology is essential for public agencies.

The financial implications of these advances include both technology and personnel costs, and the explicit consideration of these costs assists public officials in managing the organizational impacts

of technology changes. Internal support for the adoption of new technology is necessary for its effective implementation; this internal support is measured across all levels of employees in the agency. Planning for adequate training and job redefinitions is critical for such support. Internal support will limit employee opposition, potentially resulting in significant gains in efficiency and effectiveness.

The planning process should be designed to meet current needs while maintaining the capacity to address future demands. Adequate planning is necessary before a technology project takes on a life of its own. Public officials should evaluate the efficiency, sustainability, and organizational impacts of a project while they are still in control.

References

Benton, J. Edwin, Jacqueline Byers, Beverly A. Cigler, Kenneth A. Klase, Donald C. Menzel, Tanis J. Salant, Gregory Streib, James H. Svara, and William L. Waugh, Jr. 2007. Conducting research on counties in the 21st century: A new agenda and database considerations. *Public Administration Review* 67:968–83.

Center for Digital Government. 2003. Pay IT Forward: Doing the public's business with digital technologies while reducing pressure on the general fund. http://media.centerdigitalgov.com/Pay_IT_Forward/pay_IT_lowres.pdf.

Dawes, Sharon S. 2008. The evolution and continuing challenges of e-governance. *Public Administration Review* 68:S86–102.

de Abreu, Aline F. and David W. Conrath. 1993. The role of stakeholders' expectations in predicting information systems implementation outcomes. Proceedings of the 1993 Conference on Computer Personnel Research, St. Louis, Missouri, 1993, 408–15.

Evans, Donna and David C. Yen. 2006. E-government: Evolving relationship of citizens and government, domestic, and international development. *Government Information Quarterly* 23:207–35.

Feller, Irwin. 1980. Managerial response to technological innovation in public sector organizations. *Management Science* 26:1021–30.

Gil-Garcia, J. Ramon and Ignacio J. Martinez-Moyano. 2007. Understanding the evolution of e-government: The influence of systems of rules on public sector dynamics. *Government Information Quarterly* 24:266–90.

Harris, James. 2004. The road to ERP optimization. *Government Finance Review* 20:19–22.

Ho, Alfred Tat-Kei and Anna Ya Ni. 2004. Explaining the adoption of e-government features: A case study of Iowa county treasurers' offices. *The American Review of Public Administration* 34:164–180.

Lambright, W. Henry. 1972. Government and technological innovation: Weather modification as a case in point. *Public Administration Review* 32:1–10.

Li, Feng. 2003. Implementing e-government strategy in Scotland: Current situation and emerging issues. *Journal of Electronic Commerce in Organizations* 1:44–65.

McKean, Ronald N. 1972. Property rights within government, and devices to increase governmental efficiency. *Southern Economic Journal* 39:177–86.

Ni, Anna Ya and Alfred Tat-Kei Ho. 2005. Challenges in e-government development: Lessons from two information kiosk projects. *Government Information Quarterly* 22:58–74.

Pirog, Maureen A. and Craig L. Johnson. 2008. Electronic funds and benefits transfers, e-government, and the Winter commission. *Public Administration Review* 68:S103–14.

Robbins, Donijo and Gerald J. Miller. 2008. Using capital budgeting for managing e-government expenditures. *International Journal of Public Administration* 31:137–50.

Rocheleau, Bruce. 1985. Microcomputers and information management: Some emerging issues. *Public Productivity Review* 9:260–70.

Rocheleau, Bruce. 2006. *Public Management Information Systems.* Hershey, PA: Idea Group Publishing.

Scholl, Hans Jochen. 2006. Electronic government: Information management and capacity, organizational capabilities, and the sourcing mix. *Government Information Quarterly* 23:73–96.

Simon, K.D. 2005. The value of open standards and open-source software in government environments. *Systems Journal* 44:227–38.

Stegman, Michael A., Jennifer S. Lobenhofer, and John Quinterno. 2003. The state of electronic benefit transfer (EBT). Working paper, Center for Community Capitalism: Chapel Hill, NC.

Thiel, C. T. 1984. MIS Is angry and bitter, but forward-thinking and very clever. *Infosystems* 31:54–6.

West, Darrel M. 2004. E-government and the transformation of service delivery and citizen attitudes. *Public Administration Review* 64: 15–27.

Wilson, Woodrow. 1887. The study of administration. *Political Science Quarterly* 2:197–222.

Wriston, Walter B. 1988. Technology and sovereignty. *Foreign Affairs* 67:63–75.

Wu, Liangfu and Bruce Rocheleau. 2001. Formal versus informal end user training in public and private sector organizations. *Public Performance and Management Review* 24:312–21.

Yin, Robert K. 1977. Production efficiency versus bureaucratic self-interest: Two innovative processes? *Policy Sciences* 8:381–99.

Chapter 17

Understanding Large-Scale Project Failure: The Contribution of Organizational Change, Collaboration, and Leadership

Marilu Goodyear, Mark R. Nelson, and Linda Williams

CONTENTS

17.1 Introduction

The United States has one of the safest and most reliable air traffic control systems in the world. However, despite its safety track records, the current air traffic control system is functioning in an environment with unprecedented challenges. The demand for air transportation is outpacing capacity; the stress on the system is evident in an increase in delays and cancellations. The aging infrastructure with the Federal Aviation Administration (FAA), airports, and in the airplanes

themselves and economic pressure on the airlines all play into the challenge and limit the ability of the agency to respond to these complex issues. Greenhouse gas emissions and other environmental concerns are arising from inefficient use of aircraft and airspace, and security concerns are growing. Added to this challenge are new types of aircraft and new ways of thinking about the transportation airspace, which calls for innovation at the FAA. The FAA is in the process of designing and implementing what it calls the "NextGen" air transportation system, which will redesign the system by replacing ground-based radar technology and voice communication with satellite navigation, digital communications, an integrated weather information system, and tailored individual flight paths.

Like many governmental agencies, the FAA relies on an aging legacy infrastructure. For example, the FAA system that guides air traffic, NADIN (National Airspace Data Interchange Network), was originally put in place back in the 1980s. In August 2008, an update to flight-plan data resulted in a system crash that delayed over 600 flights and had air traffic controllers scrambling to ensure the safety of in-air flights. Efforts to replace portions of the communications infrastructure have resulted in multiple outages at various major airports, delaying hundreds of flights [Conkey and Pasztor 2008]. The agency is increasingly challenged by balancing between repairs and modernizing the legacy infrastructure and architecture.

The challenge facing the FAA has many of the elements common in large-scale governmental technology transitions. The air traffic control system is, in fact, not one system at all but a number of overlapping systems utilized by federal employees and airport and airline personnel resulting in great complexity and significant size. The safe functioning of the air transport industry is of critical importance to the public and, given its visibility, an important element in the FAA's ability as an agency to gain and maintain the trust of the public and overseers in the legislative and executive branch. The challenge to gain and maintain that trust is mitigated by the track record of the agency. While recent projects have been more successful, FAA projects in the past have experienced cost overruns, lengthy delays, and performance shortfalls. This is a fate not unusual for large scale federal projects but a history which will need to be overcome by the current leaders of the agency.

Given the complexity of the system, the timeline for the transition is multi-year branching across administrations and legislative tenures. The rapid development of technology ensures that planning for the new system will be consistently challenged by the shift in technology capability. Last, but certainly not least, the FAA challenge is in fact a multi-organization and multi-sector challenge. As the Government Accountability Office notes, the NextGen project "extends beyond FAA to include multiple federal agencies, including the Department of Defense and the Nation Aeronautics and Space Administration, as well as nonfederal aviation stakeholders, such as aviation equipment manufacturers, airports, and aircraft operators" [Government Accountability Office 2009]. Due to this complexity and the history of past failures, the GAO plans to "closely monitor" the FAA's implementation of NextGen. The transition holds within it a significant challenge to collaborative leadership and decision-making.

The number, size, complexity, and importance of large-scale IT projects in government agencies are on the rise. The "high risk" series of projects monitored by the U.S. Government Accountability Office (GAO) provides a list of troubled technology projects designed to address broad-based transformations, modernization, and efficiency and effectiveness at various agencies. Since the list's creation in 1990, there have been 37 additions, 19 removals (including 8 of the original 14), and two consolidations [Government Accountability Office 2009]. The most recent listing contains 30 projects, several of which are focused on modernization efforts such as,

but not limited to, the Internal Revenue Service, the U.S. Financial Regulatory System, and the Department of Defense. The press in recent years on the Trinity Project within the U.S. intelligence community is a fresh example of a story we see repeated throughout the public sector, both in the United States and abroad. These trends stem from a desire to integrate and modernize various existing systems in order to improve the efficiency and effectiveness of government operations and service to the public. Unfortunately, these large-scale, integration-oriented IT projects are particularly prone to failure.

Failures among these projects represent significant costs to both the organization and society. Projects of this criticality may span over a number of years and cost hundreds of millions of dollars or more. When large government agencies undertake projects, their failure has critical effects on the large number of users of governmental services. In the case of agencies like the FAA, there may even be life or death consequences that result from system failures. Often in the public sector, there are no viable substitutes for the products and services being delivered, and many of these situations affect the user of the service in life-threatening ways, as we have recently seen in the new Medicare prescription drug transition and in disaster response. The cost of failure is more critical and visible when large government agencies undertake major projects. In those cases, the project expense is ultimately paid by the taxpayer, and any disruption of service provided by these agencies may have far-reaching effects beyond just the functioning of the government.

Unfortunately, due to their size and complexity, large-scale IT projects can quickly become troubled and may fail to meet original requirements, budgets, or schedules. Private-sector IT projects are often driven by competitive forces, where quick response is often better than no response. Public-sector IT projects, in contrast, are constrained by public accountability and visibility. Mistakes or failures can have significant negative effects on society and receive widespread media and legislative attention, thereby encouraging failure to act over acting too quickly [Bozeman and Bretschneider 1986; Margetts and Willcocks 1994].

It is clear that the traditional ways of leading and managing large-scale IT projects have not been as successful as government leaders anticipated. This chapter seeks to draw in important concepts from other literatures to enhance the traditional approaches to IT project management. Recent research in the areas of leadership, organizational change, and collaboration across organizational boundaries appear to be relevant to the challenge of implementation of large-scale projects.

Drawing on prior research, this chapter will first define large-scale information technology projects and discuss the particular challenges for large-scale public sector projects. Secondly, the chapter will discuss the critical role of leadership drawn from the literatures of risk management, leadership organizational change, and innovation in the successful design and implementation of these projects. Third, the chapter will explore the potential contributions of the literature on collaborative management to the application of successful technology transitions. The overarching question we seek to address is, "What are the most important elements and skills of leadership needed to address the challenges that surround large-scale, boundary-spanning IT projects in government agencies?"

17.2 The Impact of Size and Complexity in IT Projects

There are a variety of definitions for "large-scale" in the literature, which stem from the difficulty in establishing a single variable or limited set of variables that define "largeness" in general

[Brussaard 1992; Zmud 1980]. We are not concerned, however, with large-scale systems simply as a reflection of size alone. We must also consider the degree of complexity involved. It is the complexity of the systems, in addition to size, that makes the design and development of large-scale systems using traditional development tools and techniques very difficult. Thus, it is at the intersection of large size and very complex that we find the class of IT projects that are most prone to failure. Unfortunately, it is this very class of IT projects that we find with increasing frequency in public-sector organizations.

Figure 17.1 illustrates the relationship of size and complexity to the information systems development environment. In the upper right quadrant are the largest and most complex systems. The combined size and complexity of these systems lead to environments with a large number of constantly changing requirements. Examples include the Trinity Project for the U.S. intelligence community, the modernization efforts at the U.S. Internal Revenue Service, and the modernization of the FAA. Projects in this quadrant may be characterized as "design and build," where developers are gathering requirements, designing, and building the final system simultaneously. Such concurrent activity is required because if developers were to wait until all requirements were gathered and constant, design and construction would never begin.

Existing literature includes minimal research on design and build environments, despite growing case study evidence that these environments are more likely to appear as organizations attempt larger and more complex system development. Unfortunately, this lack of research means there is a lack of well-tested techniques to support developing applications within a design and build environment.

In the current era, it is not uncommon to expect government agencies to be faced with large-scale, complex IT projects. Many government agencies rely on legacy information systems and architectures designed to support operations as they were designed decades ago. The modernization of those systems, while simultaneously maintaining existing service levels and meeting newly mandated requirements for daily operation or reporting, creates complexity. Many large-scale government systems efforts in the past two decades involve integration across many systems,

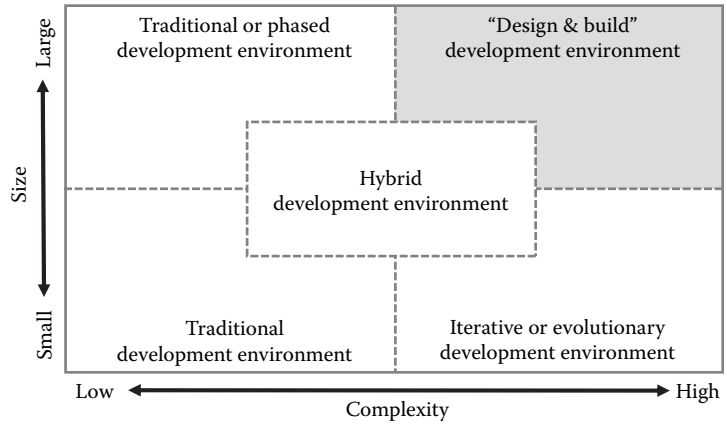


Figure 17.1 Size versus complexity and the common IS development environment. (From Morse, R.S. Buss, T.F. and Kinghorn, C.M. *Transforming Public Leadership for the 21st Century*, Armonk, NY: M.E. Sharpe, 310, 2007. With permission.)

platforms, organizations, and stakeholders, further increasing the complexity and challenge. Many of the individual components could be viewed as large-scale IT projects, but full-scale modernization efforts that involve integration to improve agency efficiency and effectiveness can quickly result in projects expected to last years, if not decades, and cost in the billions of dollars. At the same time, regulatory and other requirements do not stand still, and may, in fact, change quite rapidly or frequently. Projects facing these conditions would be considered large and complex by almost any metric, and are not unexpected when a large government agency considers the need to modernize. Due to frequent changes in leadership and legislation common in the public sector, public sector organizations engaged in large-scale IT projects can quickly find themselves in a design and build situation. This leads to a number of challenges for public-sector IT leaders, which comprise the next section of this chapter.

To summarize, it is not unexpected to find that public sector information systems projects can be both large and complex. They are likely to experience frequent changes due to more volatility in leadership and interference from external stakeholders. Because such projects could take years to complete, with constantly changing requirements, public sector organizations are often forced to begin development before all of the system requirements can be known, resulting in a design and build development environment. Lacking sufficient development and project management capabilities to handle the challenges associated with these large, complex development environments, public sector organizations are put at greater risk of budget and schedule overruns, or outright project failure. Such environments increase the risks present in systems development and may inhibit an organization's ability to innovate and learn.

17.3 The Unique Challenges of Public Sector Large-Scale IT Implementations

Implementing new information technology (IT) applications in public sector organizations, as compared to private sector organizations, is undeniably more difficult due to additional constraints [see for example, Rocheleau and Wu 2002; Bozeman and Bretschneider 1986; Mohan et al. 1990]. While there are technical challenges to overcome in the public sector, the greater challenges are organizational and managerial in nature. In relationship to likelihood to fail, prior research posits that the motivation to terminate or alter existing courses of action tied to poor performance or likely failure is lower in public organizations than in private organizations [Meyer and Zucker 1989]. This likely increases the barriers to organizational learning following a large-scale IT project failure, despite the critical need to do so. Unfortunately, our understanding of these challenges is somewhat limited as the research on large-scale systems implementation is insufficiently broad, lacking methodological and model diversity, longitudinal views, and comprehensive system views [National Research Council 2000].

The research shows that in relation to large-scale government IT project failure, often the same mistakes are repeated time and again, sometimes over decades. In many cases, the errors that appear are common problems that have been well documented in both research and practitioner literature. This raises a question as to why organizations fail to learn and apply these lessons. The term "absorptive capacity" is used to describe an organization's ability to "recognize the value of new information, assimilate it, and apply it" to achieve organizational goals [Cohen and Levinthal 1990]. In crisis-like situations, such as the imminent failure of a large-scale IT project, organizational behaviors emerge that may decrease an organization's absorptive capacity

and subsequently its ability to learn. The problem is made more difficult in situations where the environment is highly dynamic and the feedback regarding the outcomes of decisions or actions are delayed [Gibson 2000]. For the design and build system development environment present for many large-scale government IT projects, these barriers are reinforced by rigid structural or bureaucratic elements embedded within organizational culture.

Because large-scale IT projects are a fundamental change for the organization, success requires a wide-scale, coordinated response from all organizational units. Failure is not a failure of the technology or IT leadership alone; it is a failure of the overall organization and its leadership. This is particularly true for public-sector organizations where the additional constraints increase the likelihood that a large-scale IT project will take place in a design and build environment. The primary challenges for large-scale IT projects focus on elements within the influence of the leaders of the organization. The influence of leaders is mitigated by several aspects of large-scale IT projects.

First, the length of time it takes to implement large-scale projects poses several challenges. Leaders are likely to change during the project requiring that new leaders gain an appreciation for and dedication to the project. This often means that leaders need to coordinate and integrate the constantly changing requirements as large IT projects extend over long periods of time. In addition to requirements changing, there are changes in technology and subsequent changes in user interaction with the system over longer periods of time.

Second, managing a diverse set of stakeholders in a prolonged change process requires a constant communication and coordinated response process. Public-sector IT projects have greater interdependence with other organizations and require more participation from external stakeholders, each which may have exceedingly divergent goals and expectations of IT investments [Rocheleau, 2000; Kraemer and Dedrick, 1997; Bretschneider, 1990]. The presence of many stakeholders with conflicting objectives and varying levels of administrative understanding requires better methods for managing or coordinating the decision-making process. Effective decision making requires collaborative approaches including IT managers, who know the technology risks best, internal managers, who know the work processes best, and system users, both internal and external, whose acceptance is critical to success. To be effective in their roles, each of these groups need an understanding of the technologies involved and the implications of functional administrative decisions on policy. A particular challenge for government agencies is the separation of policy decisions from understanding of the related technical and administrative decisions, which must be dealt with during an implementation [Margetts and Willcocks 1994; Derthick 1990].

While public-sector large-scale IT projects are prone to many challenges, we believe that important challenges can only be addressed at the organization level with focus and attention of the organizational leader and the understanding and cooperation of managers throughout an organization. Some of the most critical challenges requiring a more unified response include overcoming a failure to learn, recognizing and managing escalation of commitment, and coordinating interdependent decision-making.

Escalation theory addresses the continued commitment to a previously chosen course of action in spite of negative feedback concerning the viability of that course of action [Brockner 1992; Drummond 1996; Keil 1995; Staw 1981]. The result can be an excessive expenditure of resources long past a point where success is feasible. Research shows that IT projects are more likely to escalate than other projects [Keil and Mann 1997], and because large-scale projects require significant long-term resource commitment and are driven by a strategic need, they are more likely to escalate than other IT projects. Evidence suggests that similar escalation behaviors exist internationally

and in both government and business organizations [Keil et al. 2000; Keil, Mann, and Rai 2000; Keil et al. 1994-1995; Staw 1981; Staw 1976].

While escalation of commitment may occur in both public and private organizations, due to differences in the IT project environment, it may not unfold in the same way. Due to concern over public accountability, failing projects in government agencies can evolve into situations where "failure is not an option," resulting in further escalation of commitment and resistance to corrective action. In such situations, organizations and individuals tend to restrict information processing, reduce the number of decision options and alternatives considered, and increase internal focus and reliance on established routines and procedures [Mone et al. 1998; Staw et al. 1981; Greening and Johnson 1996; Turner 1976]. This can lead to inflexibility in meeting challenges and can become "an active counterforce to change," [Bowen 1987; Staw 1982] resulting in further reduction of innovativeness [Cameron et al. 1987] and the decreased likelihood that an organization will take the actions necessary to prevent future failure. Managing escalation of commitment is critical to helping government agencies to prevent large-scale IT projects from failing. This is made quite difficult by the number of individual and organizational factors promoting escalation of commitment in the public-sector systems development environment.

The organization-wide implications of these projects and their interdependence, complexity, and large-scale nature, may result in many of the underlying causes of failure residing outside the domain or control of IT leaders and personnel. This suggests that providing guidelines for managing large-scale IT projects to IT project managers alone is not sufficient. We must focus on developing change competencies throughout an organization and particularly among non-IT leaders and managers within an agency.

Clearly, all public sector leaders need to develop increased comfort and competency with organizational responses to the managerial and organizational challenges that accompany large-scale IT projects, as well as a better understanding of the technical challenges as well.

17.4 Leadership Competencies for Successful Large-Scale IT Project Implementations

A new research emphasis within the public administration literature is the focus on the collaborative nature of governance. This research is based on the historical view that hierarchical organizational structures along with bureaucracy were developed to address the needs of the agricultural and industrial ages. In our current information age, employees reach across organizational boundaries, information flows freely within and across organizations, and communication flows easily up and down as well as across organizational structures. The hierarchy is no longer the sole means for organizational communication and action. Instead, we have ushered in environments were coalitions and networks are a significant means for accomplishing work. Collaborative public management can be defined as "the process of facilitating and operating in multi-organizational arrangements to solve problems that cannot be solved or solved easily by single organizations [O'Leary, Gerard, and Bingham 2006]. These networks can function in temporary or permanent forms and they accomplish simple acts of information exchange up to sophisticated "action networks" with real and lasting responsibilities [McGuire 2006].

Collaborative public management focuses on a specific competency—working collaboratively—that is an essential skill in large-scale systems integration efforts. In the introduction to

this paper, the challenge facing the FAA in implementing the NextGen air traffic control system is an example of a collaborative project. The project not only requires collaboration within the FAA between functional specialists and sub-units that play different roles (service and regulatory) but it also requires extensive collaboration with other federal agencies. Intergovernmental involvement is also at play with the critical role played by airports, managed in a variety of ways by local government boards and private sector arrangements. Add to the mix a variety of private sector organizations including technology contractors, the airlines, and a wide variety of suppliers and the collaboration challenge is apparent. The challenge appears to be immense and potentially prone to failure. Kettl [2006] points out that 26 programs listed in the Government Accountability Office's high-risk series deals directly with a federal initiative that collided with existing bureaucratic "boundaries"—that is, the things organizations are responsible for doing and what powers and functions lie elsewhere. This is understandable given the complex collaborative challenge these types of projects present, assuming that traditional hierarchical approaches to the leadership of such a project are clearly out of the question, what approach will take their place?

Morse [2008], in his review of research on collaboration, notes that the role of leadership is consistently recognized as significant in these endeavors. This research is also beginning to specify what exactly these leaders do. Morse [2008] offers an outline for the process of collaboration. Collaboration begins with a prerequisite or reason to collaborate, which can take the form of a shared problem or some sort of catalyst where leaders see joint opportunities to accomplish goals. The second stage consists of "convening" the collaboration, which focuses on identifying whom will collaborate and frame the issues to be addressed. Convincing important stakeholders to come to the table is also a part of this stage. The third stage comprises "exploring and deciding," where desired outcomes are identified and strategies are determined. This stage often involves some sort of agreement being forged. The last stage is "doing and sustaining," during which the actual work of the collaboration is accomplished and outcomes are monitored. A key factor in this stage is the ability to facilitate the network of individuals and organizations to maintain the strength of commitment. Given the need for strong leadership throughout this collaborative process, researchers have asked the question: What competencies are necessary to lead collaborations?

Two recent publications attempt to pull together the attitudes, skills, behaviors, and competencies necessary for leaders in collaborative environments. Morse [2008] presents an outline of general public leadership competencies and then singles out those competencies that appear to be most important for collaborative leadership. His list includes attributes, skills, and behaviors as follows:

- Attributes
  - Collaborative mindset
  - Passion toward outcomes
  - Systems thinking
  - Openness and risk taking
  - Sense of mutuality and connectedness
  - Humility
- Skills
  - Self-management
  - Strategic thinking
  - Facilitation skills

- Behaviors
  - Stakeholder identification
  - Stakeholder assessment
  - Strategic issue framing
  - Convening working groups
  - Facilitating mutual learning processes
  - Inducing commitment
  - Facilitating trusting relationships among partners

Morse provides an extensive analysis of these concepts drawing on research done across the leadership and organizational development literature. His outline provides, for the first time, a summarized view of what the new "collaborative leader" needs to be successful. His contribution is well matched by a second piece of research that embeds theoretical views of what leaders need in the practical world of actual federal employees engaged in collaborative activities.

Getha-Taylor [2008] focuses on the competencies needed for collaboration. The work argues for the use of competencies because they focus on the future and they include traits, motives and behaviors. In addition, they seek to answer the question: How do we know good performance when we see it? If competencies can be defined for collaborative leadership then they can serve as a foundation for hiring, training, and developing outstanding employees. The study utilizes twelve of Boyatzis' [1982] competency dimensions focused on boundary spanning and compares these items to the views of employees in the federal government who are known to be superior collaborators. She found that "the most significant competencies for collaborative effectiveness are (a) interpersonal understanding, (b) teamwork and cooperation, and (c) team leadership" [Getha-Taylor 2008, p. 114]. The model presented by Getha-Taylor also contributes to the understanding of competencies needed in that she presents negative indicators of the competencies as well as positive ones.

In a 2007, Goodyear and Nelson outlined critical organizational elements for adapting to and responding to wide-scale organizational change, such as what we see with many large-scale IT projects. These elements were drawn from the literatures of risk management, innovation, and organizational change. Elements that focused on the individual level within the organization included: (1) building trusting relationships; (2) fostering participation; (3) supporting risk taking; and (4) supporting employee learning. Three areas related to organizational leadership of major IT projects were: (1) placing an emphasis on vision and core values; (2) improving communication; and (3) ensuring information sharing and use. These recommendations point to the need for leaders to pay as much attention to the organizational issues as they do the technical issues during implementations. They also emphasize the critical role that "soft skills" play in successful information technology leadership.

There is a great deal of similarity between the areas discussed by Morse [2008] and Getha-Taylor [2008] and those found in the literature by Goodyear and Nelson [2007]. Goodyear and Nelson [2007] found that building trusting relationships are a key recommendation in risk management literature. Xia and Lee [2004] recommend the establishment of long-term relationships built on trust as critical to controlling risk. Ahmed, in his review of critical organizational elements for innovation, found high trust environments related to the generation of new ideas [Ahmed 1998]. There is also evidence demonstrating the necessity of building trust in implementing change processes noting that resistance to change is increased where there is distrust in those leading the change [Rusaw 2001; Yukl 2006]. Morse [2008], when discussing the attribute of "sense of mutuality and connectedness," notes that "trust is a widely recognized

factor in successful collaboration," such trust being an important underlying factor in effective relationships. Getha-Taylor concludes that the "most significant competencies for collaboration effectiveness are (a) interpersonal understanding, (b) teamwork and cooperation, and (c) team leadership" [2008, p.114]. The literature of innovation suggests that a sense of shared responsibility among work groups is important to successful innovation [Light 1998; Frederickson 2003]. All of this research points to the critical factor of trusting relationships in effective collaboration and innovation. How might these insights be incorporated into the implementation of large-scale projects?

Recently, a new approach for dealing with large-scale, complex systems integration efforts has been developed by the Australian Department of Defence (College of Complex Project Management) when it commissioned an effort to develop competency standards for complex project managers. The College of Complex Project Managers set forth the idea of a complex project specialty in the field of project management. In their view, complex projects require different approaches and different perspectives than other projects since they are dynamic, open systems that are non-linear with a high degree of uncertainty [College of Complex Project Management, Section 3]. Proponents of complex project management assert that these characteristics create a system that is evolving and unpredictable requiring project managers with insight and expertise to steer them to successful completion. They believe that "competencies required to project manage complex projects go well beyond those required for traditional projects" and "require much greater breadth and depth in the new competencies than that required by traditional project managers" [College of Complex Project Management, Section 4]. Building on traditional project management competencies, this different view of project management incorporates more organizational and leadership competencies. This new standard for complex project management is not without its critics [Whitty and Maylor 2007], but is receiving attention as a potential model for large-scale system project management [National Association for Public Administration 2008].

Table 17.1 compares the skills sets outlined in the College of Complex Project Management [2006] competency standard with the skill sets recommended by the collaborative management literature as represented by Morse [2008] and Getha-Taylor [2008]. Despite the development of these competencies and skills from different theoretical and practical perspectives, there is similarity of the areas covered. The authors were able to categorize the elements into four areas: interpersonal/personal, communication, decision making, and team building. In the area of interpersonal, the College of Complex Project Management provides more specific skills than are other two sources, but there is overlap. Commitment, openness to criticism and learning, and understanding motivation are included in at least two of the sources. In the area of communication, both the College of Complex Project Management and Morse include elements of communication to stakeholders and a focus on vision and issue framing.

System thinking is common to the sources in the area of decision-making. Conflict resolution included in the Getha-Taylor source and issues resolution is an underpinning area of leadership knowledge in the College of Complex Project Management. The area of team building has a great deal of commonality between the sources with an emphasis on responsibility, humility and understanding motivation. The collaboration literature sources also shared a common emphasis on mission and goals with a connection to public service outcomes. As Table 17.1 visually illustrates, there is some coherence between the sources we reviewed and the competencies needed for leadership engaging in complex project management which incorporates collaboration. The authors believe that these areas hold great potential for the enhancement of educational programs aimed at leaders responsible for implementation of large-scale projects.

Table 17.1 Comparison of Competencies and Skills

Category	*College of Complex Project Management*	*Getha-Taylor*	*Morse*
	Action	*Competency*	*Competency*
Interpersonal	Viewed as personally committed		Inducing commitment
	Open to criticism, learning, opposing views	Team leadership: bridges diversity: values other perspectives on shared problems	Openness and risk taking
	Understands individual motivation	Interpersonal understanding: understands motivation	
	Strives to understand underlying problems		
	Objectively presents views of person's strengths and weaknesses		
	Responds effectively to change		
		Interpersonal understanding: demonstrates empathy	
Communication	Communicates strategy to stakeholders		Strategic issue framing
	Seeks external views		Stakeholder identification and assessment
Decision making	Big picture focus		
	Issues resolution	Teamwork and cooperation: collaborative conflict resolution	
	Systems thinking		Systems thinking
			Strategic thinking

continued

Table 17.1 (continued)

Category	*College of Complex Project Management*	*Getha-Taylor*	*Morse*
	Action	*Competency*	*Competency*
Team building	Selects key people		Convening working groups; Stakeholders identification
	Accepts responsibility and admits mistakes		Humility
	Learns from mistakes		
	Understands team motivation and diversity	Team leadership: bridges diversity; Interpersonal understanding: understands motivation	Stakeholder assessment
		Inclusive perspectives	
			Facilitating trusting relationships among partners
			Facilitate mutual learning
Mission/Goals		Team leadership: creates line of sight: Connect goals with public service outcomes	Passion toward outcomes
	Creates compelling vision		Passion toward outcomes
			Sense to mutuality and connectedness

17.5 Conclusion: The Importance of the Leadership Role

Over the past two decades, we have learned a great deal about implementing large-scale IT projects in the public sector. Despite the growing literature on project management and organizational change, recommended approaches have frequently failed to be adopted by government agencies. As we noted earlier in this chapter, overcoming the failure to learn and managing escalation of commitment are critical to large-scale IT project success. These challenges cannot be overcome without a focus on leadership within the overall organization and the roles that leaders play in coordinating collaborative endeavors.

Changing this pattern requires leadership to recognize the nature of the challenges they face, particularly recognizing that the challenge is often characterized by collaboration both within the organization and with other organizations. The increasingly important research stream concerning collaborative management is directly relevant to the successful implementation of large-scale IT projects. We have sought in this paper to highlight the relevant literature which speaks to leadership effectiveness in collaborative projects. We have also included relevant concepts from the literatures of risk management, innovation, and organizational change. The competencies identified provide a road map for leaders as they seek to develop the leadership skills needed to ensure successful large-scale implementations.

The information technology project management literature has begun to incorporate these perspectives through the College of Complex Project Management. This movement to incorporate more leadership "soft skills" along with traditional project management holds great potential for IT leaders as they seek to educate the managers needed to implement technology transitions in governmental organizations.

The authors believe that redefining the roles of governmental leaders to include collaborative competencies and project management skills will result in more than just higher success at large-scale IT projects. These changes will contribute to developing organizational environments that can coordinate and integrate new processes and technologies more rapidly, more effectively, and at lower cost. Continuing our pursuit of this line of inquiry will benefit our understanding of key elements for success at large-scale IT projects within governmental agencies. This chapter began by introducing the challenges faced by the FAA in implementing the new NextGen air traffic control system. If the FAA is to be successful, they will need to increase the number of leaders skilled at managing risk, innovation, and organizational change in a collaborative way [NAPA 2008]. The real challenge for the FAA and other government agencies involved in large-scale IT projects lies in how to develop the new leadership roles and capabilities rapidly enough to overcome the constantly changing demands and increasing complexity of the design and build development environment.

We can expect that the number, size, and complexity of large-scale IT systems in use will only increase in the years to come. As reliance of public-sector organizations on sophisticated and complex, large-scale applications continues to grow, the payoff from studying the dynamics of large-scale IT projects and their management also increases. Successful resolution of the issues associated with management of large-scale systems development in the public sector will reduce future development costs, improve the predictability of outcomes, and enhance the speed of innovation. We hope that this chapter, along with future research, may provide government agencies like the FAA with new tools and strategies to approach this challenge.

References

Ahmed, Pervaiz 1998. Culture and climate for innovation. *European Journal of Innovation Management* 1(1): 30.

Bowen, Michael G. 1987. The escalation phenomenon reconsidered: Decision dilemmas or decision errors. *Academy of Management Review* 12(1): 52–66.

Bozeman, Barry, and Stuart Bretschneider. 1986. Public management information systems: Theory and prescription. *Public Administration Review* 40(Special Issue): 475–487.

Boyatzis, R. E. (1982). *The Competent Managers: A Model for Effective Performance*. New York: Wiley-Interscience.

Bretschneider, Stuart. 1990. Management information systems in public and private organizations: An empirical test. *Public Administration Review* 50(5): 536–545.

Brockner, Joel. 1992. The escalation of commitment to a failing course of action: Toward theoretical progress. *Academy of Management Review* 17(1): 39–61.

Brussaard, Bas K. 1992. Large scale information systems: A comparative analysis. In *Informatization Developments and the Public Sector,* edited by Paul H.A. Frissen. European Public Administration and Informatization Series, 2: 171–183. Amsterdam, The Netherlands: IOS Press.

Cameron, Kim S., David A. Whetten, and Myung U. Kim. 1987. Organizational dysfunctions of decline. *Academy of Management Journal* 30: 126–138.

Cohen, Wesley M., and Daniel A. Levinthal. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly* 35: 128–152.

College of Complex Project Managers, and Defence Materiel Organisation. 2006. Competency standard for complex project managers. Public release version 2.0, Department of Defence, Commonwealth of Australia. http://www.corped.bus.qut.edu.au/documents/Complex_PM_v2.0.pdf

Conkey, Christopher, and Andy Pasztor. 2008. FAA rushes to fix aging system that caused delays. *Wall Street Journal* (August 28): A3. http://online.wsj.com/article/SB121988583932078345.html

Derthick, Martha. 1990. *Agency under Stress*, Washington, DC: Brookings Institute.

Drummond, Helga. 1996. *Escalation in Decision-Making: The Tragedy of Taurus.* New York, NY: Oxford University Press.

Frederickson, H. George. 2003. *Easy Innovation and the Iron Cage: Best Practice, Benchmarking, Ranking, and the Management of Organizational Creativity*. Dayton, OH: The Kettering Foundation.

Getha-Taylor, Heather. 2008. Identifying collaborative competencies. *Review of Public Personnel Administration* 28: 103–119.

Gibson, Faison P. 2000. Feedback delays: How can decision makers learn not to buy a new car every time the garage is empty? *Organizational Behavior and Human Decision Processes* 83(1): 141–166.

Goodyear, M., and M. R. Nelson. 2007. Leadership strategies for large-scale IT Implementations in government. In *Transforming Public Leadership for the 21st Century*, ed. R. S. Morse, T. F. Buss, and C. M. Kinghorn, 308–323. Washington, D. C.: National Academy of Public Administration and M. E. Sharpe.

Government Accountability Office. 2009. *Report to Congress, High-Risk Series: An Update*. Washington, D.C.: GAO-09-271 (January).

Greening, Daniel W. and Richard A. Johnson. 1996. Do managers and strategies matter? A study in crisis. *Journal of Management Studies* 33(1): 25–51.

Keil, Mark. 1995. Pulling the plug: Software project management and the problem of project escalation. *MIS Quarterly* 19(4): 421–447.

Keil, Mark, and Joan Mann. 1997. The nature and extent of information technology project escalation: Results from a survey of IS audit and control professionals. *IS Audit and Control Journal* (1): 40–48.

Keil, Mark, Joan Mann, and Arun Rai. 2000. Why software projects escalate: An empirical analysis and test of four theoretical models. *MIS Quarterly* 24(4): 631–664.

Keil, Mark, Richard Mixon, Timo Saarinen, and Virpi Tuunainen. 1994–1995. Understanding runaway information technology projects: Results from an international research program based on escalation theory. *Journal of Management Information Systems* 11(3): 65–85.

Keil, Mark, Bernard C. Y. Tan, Kwok-Kee Wei, Timo Saarinen, Virpi Tuunainen, and Arjen Wassenaar. 2000. A cross-cultural study on escalation of commitment behavior in software projects. *MIS Quarterly* 24(2): 299–325.

Kettl, Donald F. 2006. Managing boundaries in American administration: The collaboration imperative. *Public Administration Review* 66(supplement): 10–19.

Kraemer, Kenneth L., and Jason Dedrick. 1997. Computing and public organizations. *Journal of Public Administration Research and Theory* 7(1): 89–112.

Light, Paul C. 1998. *Sustaining Innovation: Creating Nonprofit and Government Organizations That Innovate Naturally*. San-Francisco, CA: Jossey-Bass.

McGuire, Michael. 2006. Collaborative public management: Assessing what we know and how we know it. *Public Administration Review* 66(supplement): 33–43.

Margetts, Helen, and Leslie Willcocks. 1994. Informatization in public sector organizations: Distinctive or common risks? *Informatization and the Public Sector* 3: 1–19.

Meyer, Marshall W., and Lynne G. Zucker. 1989. *Permanently Failing Organizations*, Newbury Park, CA: Sage Publications.

Mohan, Lakshmi, William K. Holstein, and R. B. Adams. 1990. EIS: It can work in the public sector. *MIS Quarterly* 14(4): 435–448.

Mone, Mark A., William McKinley, and Vincent L. Barker. 1998. Organizational decline and innovation: A contingency framework. *Academy of Management Review* 23(1): 115–132.

Morse, Richardo S. 2008. Developing public leaders in an age of collaborative governance. In *Innovations in Public Leadership Development*, ed. Richardo S. Morse and Terry F. Buss, 79–100. Washington, DC: National Academy of Public Administration and M. E. Sharpe.

National Association of Public Administration. 2008. *Identifying the Workforce to Respond to a National Imperative: The Next Generation Air Transportation System (NextGen)*. Washington, DC: National Academy of Public Administration.

National Research Council, Computer Science and Telecommunication Board, Committee on Information Technology Research in a Competitive World. 2000. *Making IT Better: Expanding Information Technology Research to Meet Society's Needs*. Washington, DC: National Academy Press.

O'Leary, Rosemary, Catherine Gerard, and Lisa Bingham. 2006. Introduction to the symposium on collaborative public management. *Public Administration Review* 66(supplement): 7.

Rocheleau, Bruce. 2000. Prescriptions for public-sector information management. *American Review of Public Administration* 30(4): 414–435.

Rocheleau, Bruce, and Liangfu Wu. 2002. Public versus private information systems: Do they differ in important ways? A review and empirical test. *American Review of Public Administration* 32(4): 379–397.

Rusaw, A. Carol. 2001. *Leading Public Organizations: An Interactive Approach.* New York, Harcourt, Inc.

Staw, Barry M. 1976. Knee-deep in the big muddy: A study of escalating commitment to a chosen course of action. *Organizational Behavior and Human Performance* 16: 27–44.

Staw, Barry M. 1981. The escalation of commitment to a course of action. *Academy of Management Review* 6: 577–587.

Staw, Barry M. 1982. Counterforces to change. In *Change in Organizations*, edited by P. S. Goodman and Associates, 87–121. San Francisco, CA: Jossey-Bass.

Staw, Barry M., Lance E. Sandelands, and Jane E. Dutton. 1981. Threat-rigidity effects in organizational behavior: A multilevel analysis. *Administrative Science Quarterly* 26: 501–524.

Turner, Barry A. 1976. The organizational and interorganizational development of disasters. *Administrative Science Quarterly* 21: 378–397.

Whitty, A. J. and H. Maylor. 2007. And then came complex project management. In *The Proceedings of 21st IPMA World Congress on Project Management*, June 18–20, Cracow, Poland. http://espace.library.uq.edu.au/eserv/UQ:13419/And_then_came_Complex_Project_Management.pdf

Xia, Weidong, and Gwanhoo Lee. 2004. Grasping the complexity of IS development projects. *Communications of the ACM* 47(5): 69–74.

Yukl, Gary. 2006. *Leadership in Organizations*. 6th ed. Upper Saddle River, NJ: Pearson Prentice Hall.

Zmud, Robert. 1980. Management of large software development efforts. *MIS Quarterly* 4(2): 45–55.

Chapter 18

Strategies for Managing Health Information Technology Projects

Michael Stonis

CONTENTS

18.1 Overview

Today's health care organizations more closely resemble small multi-national organizations more than the hospitals or small hospital systems that had been the standard for many years. One of the driving forces of this expansion is the recent utilization of information systems (IS). The rate of change and the need for interoperability across systems has introduced the need for multi-departmental teams to collaborate to achieve a project. This situation poses a challenging task for management [Wheeler and Grice 2000]. Dealing with such a dynamic environment has proven to be difficult for health care with ever increasing costs, the need to balance capacity and demand, and diversifying wisely. Because of the difficulty of these challenges, over 1,400 hospitals have been forced to close from 1991 to 2006 [Linda E. Swayne 2006]. Management must both ensure the success of their individual teams and the success of the overarching project. While this can be a fairly daunting task, if the task structure is broken down into manageable sections and planned for accordingly, the process can be relatively straightforward.

This chapter discusses management techniques and best-practices, which can be implemented on health-care-based projects. The management techniques provided in this chapter can be applied almost universally to any project but have been developed and tested in the public health care realm. The content for this chapter has been derived from experiences working as a state contractor for health care integration projects, as well as from management and health care literature. This chapter is organized around the following topics:

1. Health care management considerations
2. Team management
3. Project management

18.2 Health Care Management Considerations

18.2.1 Departments

Health care poses a unique situation when it comes to management of a project, as almost all aspects of the business can be intermingled for any project. For instance, billing systems will have

dependencies on administration systems, scheduling systems will need to provide information to lab vendors, and so on. These dependencies will make the coordination of a project difficult. A single health care provider can have, but is not limited to, these departments:

1. Billing
2. Medical Records
3. Patient Scheduling
4. Patient Administration
5. Emergency
6. Nursing
7. Physical Therapy

18.2.2 HIPAA (Health Insurance Portability and Accountability Act)

HIPAA was established in 1996 to perform two main duties, which are referred to as titles. The first is to ensure that employees who lose or change jobs can maintain health insurance. The second, and more relevant to IS practices, defines the standards in which electronic health care data can be transmitted. These are commonly known as the Administration Simplification provisions. In 2002, the implementation of the Privacy Rule dramatically changed the way entities use and disclose health information. The Privacy Rule governs the use and disclosure of "protected health information" (PHI), a term that generally includes any health information that can reasonably be used to identify the individual [Roach, et al. 2006]. Because most health care providers are considered "covering entities" and subject to the Privacy Rule, HIPAA directly affects all decisions that need to be made when handling patient information. The rules defined in the Administration Simplification provisions and Privacy Rule are many and complicated. In addition, violation of the HIPAA rules can carry expensive penalties.

18.2.3 Patient Data

Before any data can be communicated, it is important to determine by whom the data will be received. Will the data be communicated to an employee of the company with valid clearance? If the data is to be communicated to a consultant or external party, have they agreed to abide to the HIPAA rules and regulations? If the data is to be communicated to an authorized party, it is generally acceptable to provide the raw information. If there are any uncertainties as to who may receive the data, or if the data is for testing purposes or may be submitted to the federal government [Rozovsky, Bellamy and Woods 2005], any patient-identifiable information should be removed or de-identified. Any patient names, addresses, and identification numbers will need to be replaced. Because of the commonality of this process, there are tools that can be used to perform these transformations on bulk loads of data.

The process in which the data is communicated is also very important. Secured communications must be present at all times. Transmission of data over a local network is generally accepted as long as the network itself is protected using some form of encryption [Freire, Chemouil and Lorenz 2004]. Because this data will not be traveling over the Internet, but a local intranet, the chance of data spying is far less. When data must be communicated outside of the local network, the transmissions must be performed over a more tightly secured and encrypted network.

It is a common practice in health care to exchange patient data between resources when working on new projects. Often times, the data has been marked as a sample message but will still contain unique patient identifying information. The transmission of this type of data to external

resources is under almost no circumstance acceptable behavior. Many e-mail systems will require that a message travel over the Internet for it to reach its final destination. At many points during the message transmission it can be intercepted and parsed. If an outside resource demands sample messages, or if an employee of a hospital would like to provide you messages with patient information, ensure that the lines of communication have been secured. The best rule of thumb is to treat the data as if it were your own, because there is always a chance that it is.

18.2.4 Health Level 7

The international standards organization known as Health Level 7 (HL7) sets standards for the exchange of electronic health information. The standards defined require only voluntary compliance, as there are no formal government-required mandates. Of the standards, the most predominant is the HL7 v2.x standard, which is a set of messages and communication protocols. These messages are used to communicate information across the entire health care organization from patient administration/registration, discharge or transfer (ADT) data, queries, orders, results, clinical observations, billing, master file update information, health records, referrals, scheduling, and patient care [Lima, Johns, and Liebler 1998]. Due to the wide scope of the standards, almost any health-care-centric application will have the ability to generate or consume HL7 messages. The goal of HL7 is to provide support for exchanges across systems in technically diverse environments. HL7 may also be communicated in a range of formats including TCP/IP, also commonly known as M/LLP, point-to-point RS-232C interconnections and various batch media [Lima, Johns and Liebler 1998].

18.2.5 Independent Verification and Validation Vendors

Due to the large and generally complicated nature of IS programs, many times an independent verification and validation (IV&V) vendor will be brought in to evaluate the success and risks of the project. An IV&V vendor typically assists with verification of program planning, assessments of technology, assessment of risk and compliance [Craig and Jaskiel 2002]. In short, the IV&V vendor aids in insuring that the project proceeds according to plan. The IV&V vendors will work with the IS staff to ensure that the documentation standards are followed by all contractors and vendors. This will ensure that, although there may be many groups contributing to the project, the documentation will be of the same caliber and format. The IV&V vendor may also request that any program documentation, such as use case diagrams, design documents, or user guides, be provided. This may force the contractors to provide these documents earlier in the project's life cycle than anticipated, but the IV&V vendor will not always be looking for a final version. Providing draft versions of design documents during a project allows the IV&V vendor to know that the resources have planned their decisions and are following sound engineering progress [Stewart, Wyskida and Johannes 1995]. The IV&V vendor will also have a firm grasp of the governmental mandates and policies that must be followed. Providing this knowledge, early in the process, to all contractors and vendors will help ease them into the environment and make certain that compliance issues are caught sooner than later.

18.3 Team Management

18.3.1 Team Members

Due to the number of disparate systems involved in most health care projects, smaller groups of project members are broken into teams. These teams are generally determined by the specialties

of each of the individual members. The teams are then broken down into at least two categories: management and resource staff. Management's role is to ensure that the team's tasks are completed successfully and timely. Management must ensure that they communicate any notifications to other teams and their resource staff. Management must also work with the resource staff to plan tasks, and coordinate efforts and identify issues. Resource staff's role is to implement the tasks assigned to the project team. The resources will have the unique skills and knowledge required for accomplishing the tasks presented to them. Resource staff can include both internal employees and contracted resources. Depending on the complexity of a project, a team may be further divided to include hierarchies within each group, such as senior and junior management.

18.3.2 Daily Meetings

Because of the complexity of most health care projects, regular meetings with project teams are needed. It works well to coordinate these meetings as early as possible. Planning the meetings about an hour after the business day works best for most, allowing everyone to catch-up on messages and gather their thoughts. Because technology allows teams to work in many disparate locations, time considerations must be taken when planning the meeting time.

The meeting length and format will usually float as deadlines approach or issues arise. Although some meetings will only last a few minutes, the team will still have been presented the opportunity to interact. It is better to have a single scheduled meeting than multiple meetings throughout the course of a day. The meeting should, at minimum, address these points:

1. High-priority issues [Kimmons and Loweree 1989]
2. Project status
3. Upcoming activities

Team meetings allow managers to plan and distribute development tasks for the day. Managers are presented with a forum to receive feedback from the team. Team members can report task status and completion ratio [Phillips 2004]. Because updates are received in one-day intervals, it facilitates an easy way for management to track progress through tasks. A spreadsheet with the project deliverables provides management a simple interface for tracking and maintaining task progression. As team members report their updates, management staff can record these updates and have real-time insight into the project's completion status. If a task is falling behind schedule, management can quickly address the situation. Alternatively, if tasks are being accomplished ahead of schedule, management can use this information to reassign resources [Wysocki 2007] or readjust delivery dates. A minor change to a system can dramatically enhance the ability of the team to progress [Pyzdek 2003]. Tracking tasks at this level of granularity will make it easier for management to manage budgets and time without having to review resource time and map it back to tasks. Because management will not have to calculate task progression—but will be provided with figures from the resources—the figures for task completion will be more accurate.

Because most health care projects involve multiple departments, management can be hit with similar or identical information from multiple sources throughout the course of the day. The meeting will allow management to aggregate the information and distribute it to the correct destination without repetition.

The resource staff also benefits from the meetings. Often times, a resource staff member will be working from task-to-task and may not have a clear view of the entire project. Learning about the other tasks that the resource teams are working on will provide insight to the entire scope of the

project. Interacting with management will provide contextual information as to how the project will be used. In many cases, this type of knowledge transfer is neglected. Having a clearer insight into the application of a project will enable resource staff to make more informed decisions that may lead to better user-interface design or providing a better design pattern [Grey and Larson 2002]. Team meetings also allow resources to work collaboratively to troubleshoot issues and provide feedback. Because resource teams will have various schedules and deadlines, it is not always possible to meet during the regular business day, so the team meeting should be held at a time that will not interfere with schedules and tasks. The key to these discussions is that they provide insight that management can use for further planning.

18.3.3 Allocating Resources

Resource teams will, in general, contain individuals who have varying amounts of experience and skills. In IS, the general categories fall under architect, analyst, and engineers. When planning task allocation, the selection of resources will be vital [Pennypacker and Dye 2002]. Architects are capable of designing project components and defining standards. Architects provide strategic insight as to how IS projects will interact and function within the organization. This knowledge will allow them to manage dependencies and take the first steps toward designing the structures of a system [Bass 2003; Clements and Kazman 2003]. Analysts provide project domain knowledge, which can be translated into requirements and specifications. Their skill base will allow them to review data and parse it for project requirements and also test project components for accuracy. Engineers provide development, testing, and evaluation expertise. An engineer will be the driving force of a project.

When allocating resources to a task, management must take into consideration the roles that each resource provides. For more complex tasks, assigning an architect a greater sum of the resources may be appropriate, ensuring that deciphering and designing the required components provides the engineering staff with a focused direction. Analyst use may be high at the start and end of projects, as they will be gathering resources and then later validating these resources. The distribution of engineering resources will be dependent on the task. For larger tasks, it is advised to mix senior and non-senior engineering resources because non-senior engineers will gain valuable experience and mentoring. Team members know that the success of a project depends on the whole of the team and not individual inputs, so it is important that team members provide each other considerable support [Grey and Larson 2002].

18.3.4 Managing Resources

Just as important as having the right resources and assigning them the right tasks is trust with your resources. If a resource has been assigned a task, they should be given the authority to complete the task. Management must remember that their role is to maintain the progression of the project and to not micromanage resources. The success of the project will be dependent on how the team executes the tasks presented before them. Micromanagement of teams leads to resources that are more insecure and stressed with the decisions they must make. The net result of micromanagement may be an increase in the actual time it takes to complete an activity. Exemplary project managers will place more confidence on their team members, knowing that the processes are in place to ensure plan attainment [Wysocki 2007].

No matter how skilled the resource is, he or she still may fail at a task or become discouraged. Therefore, it is best to check-in with resources individually during the course of the project.

Doing so can bring assurance to both parties that tasks are being accomplished as needed. Most of this information can also be gathered during the internal status meetings. This approach will demonstrate that management is serious about the success of the project and will reduce the need for performance actions [Liff 2007].

18.4 Project Management

18.4.1 Project Meetings

If possible, regularly scheduled meetings should be held between all management staff and project stakeholders. The agenda for these meetings should include reviewing accomplished tasks, discussing outstanding issues, coordinating efforts, and planning. In discussing accomplishments, management will be able to verify if all tasks have been executed properly and performed in total. Discussion of outstanding issues and coordinating effort directly correlate. Discussion of issues, especially in interdependent systems, will allow teams to voice concerns and notify all teams that may require action. Knowing which teams will need to be involved will allow for quicker collaboration on issues and lead to quicker resolutions. Once all issues have been addressed, the project teams should organize the planning of their tasks and ensure that there are not any unmet dependencies or overlapping efforts. The end result of management meetings is to make decisions that will propagate back to the project teams. The decisions made in these meetings should be thoughtful and reasoned, require little rework, and be complete. As a general rule, actions should be taken only if they will make a difference in the success of the project [Tropman 2003]. Finally, the actions should be communicated clearly to all stakeholders.

18.4.2 Status Reports

Status reports are the most significant tool a project manager has. It is the project's historical record and the one place all players, including project sponsors and those who do not attend status meetings, are held accountable for decisions and action items. Projects without status reports may have project management, but they will lack project control [Hallows 1997]. A weekly status report can reassure the client that the project is being properly managed and maintained. Depending on project size, status reports can vary from simple e-mail communications to a formalized document. The status report should be communicated to all project stakeholders. This includes vendors and contractors who may have involvement.

Any project of considerable size or complexity should have a formalized status provided. The following sections are recommended (see Appendix A for a sample):

18.4.2.1 Previous Week's Summary

A bulleted list of descriptions of the tasks and decisions that were made during the week. This section should contain information about progress made against deliverables and any detail of issues that will impede the progress of the project. A subsection for project plan changes should also be included. Descriptions of completed tasks do not have to be overly detailed but should still provide enough information to convey what had been accomplished. Because it is inevitable that there will be decisions made during a disjointed meeting, be it a phone conversation or a management meeting, all decisions will have been documented. This is useful if a disagreement or dispute should arise about a decision that was taken.

18.4.2.2 This Week/Upcoming Week

A bulleted list of descriptions of the tasks that will be accomplished within the next week. This list should include tasks for any non-IS resources and resources not considered to be *on the project*. This includes outside vendors or teams which may need to provide information or documents. Any issues that will be resolved within the upcoming week should be documented.

18.4.2.3 High-Priority Issues

A table or list that contains a description of any high-priority issues and to whom they are assigned to. A high-priority issue can be considered anything that would prevent completion of a task or dramatically alter the scope of the project. The list of items should be derived from the project's shared issues list. Items listed in this section will require immediate attention. New issues listed should be prefixed with the title "New Issue." Any updates made to the items in this list should be shown, and the title should be prefixed with "Updated Issue." If any items in the list are completed, they should be updated. The title should be prefixed with "Completed Issue" and displayed in the status for at least one additional release before removing.

18.4.2.4 Action Items

Contains a table or list that contains a description of issues and to whom they are assigned. The issues in this section usually are based around topics such as setting dates and deploying hardware, among others. The items listed may not prevent the completion of tasks, but are of a notable priority. Any updates made to the items in this list should be shown. If any items in the list are completed, they should be updated and displayed in the status for at least one additional release before removing.

18.4.2.5 Milestones

Contains a table containing all milestones, their projected completion date, and their completion status. If there are no milestones assigned to a project, general tasks or assignments can be placed in this section. The completion status should be displayed as on-track, off-track with notes, and pointers to specific issues or complete.

18.4.2.6 Budget

Contains a simple description of the current budget status of the project. If the project is within budget, simply placing the words "On Track" is adequate. If the project is in danger of going over budget or has gone over budget, this section should contain a clear statement indicating that the budget has been exceeded. Depending on the contract, further development may be halted if the budget has been exceeded, so the text description used in this section will need to be very clear.

18.4.3 Ask the Right Questions

Due to the nature and complexity of health-care-based projects, resources may get so focused on a single aspect of a project that they lose sight of the end goal and the path to that goal. In health care, there are usually many ways to describe the same process depending on which department that you are located in. This happens frequently when describing patient Identifiers. A hospital may have multiple unique identifiers for a patient because of the many software packages used, but it is usually the case that the identifiers from other packages are also stored.

18.4.4 Manage Documents

The amount of documentation generated in a project can be quite substantial. Locating the latest version of a document and communicating back changes can also be a difficult task. Furthermore, there may be a legal obligation for the project to retain a copy of all documents, what changes were made, and who received custody of the documents [Asprey and Middleton 2003]. Fortunately, there are many tools now that allow teams to manage documents in either a repository or even by allowing collaborative editing. Some tools, such as Basecamp (http://basecamphq.com/) allow project teams to work and mange all documents in a single repository with version history. Documents can also be commented on, have tags/meta data applied, or even attached to a particular milestone. Other tools, such as Zimbra Suite (http://zimbra.com) or Google Documents (http://docs.google.com), allow users to collaboratively edit documents in real-time. All of the aforementioned applications are Web-based applications, which means that all of the data exists on a centralized server as opposed to individual machines. The benefit of using such tools include improved staff efficiency and providing all stakeholders, managers, and team members exposure to the processes and materials [Bates and Smith 2007], which can be very helpful when managing multiple teams and outside resources. In health care, there are often vendors providing specialized services (e.g., lab processing, scheduling, image processing), which can be located in various places nationally or internationally. Offering a Web-based portal for document access will ensure that they are able to get the resources that they need when they need them.

18.4.5 Track Issues

Inevitably, issues will arise and, almost as inevitably, they will be forgotten and/or handed off between project resources. The main purpose of the issues log is to keep track of any issues that arise and must be addressed. It is important that issues that will not endanger a milestone or task are not included in this list. It is common for the issues list to become a shared notepad, so maintaining the quality of the issues list is important. Tracking and managing issues both during the project and afterwards will play a major factor into the success of a project.

There are many techniques to managing issues. There are pre-packaged software suites such as Microsoft's Team Foundation Server (http://msdn.microsoft.com/en-us/vsts2008/default.aspx) or Edgewall's Trac (http://trac.edgewall.org/). These types of solutions allow for integration with source code management solutions and custom reporting. An issue tracking application suite can be helpful for large projects, but they will require setup and maintenance. A simple alternative is a shared spreadsheet. In the Manage Documents section, a few collaborative document editors were provided, which can serve as a base for an issue management solution. A simple spreadsheet, that contained the following columns, would suffice for most situations (see Appendix B for a sample):

1. Issue ID
   A unique ID that can be used to identify an issue
2. Issue Description
   A short description of the issue that will provide enough description for the project team to work towards resolving the issue
3. Date & Time Recorded
   Log either when the issue was incurred or reported
4. Issue Logged By (Name or User Account)
   The individual who encountered the issue

5. Action Assigned To (Name or User Account)
   The individual who will be addressing the issue
6. Priority (1–10)
   A scale of importance of the issue with 1 representing the lowest and 10 representing the highest
7. Scheduled/Planned Release Date
   The day where any issues will be addressed
8. Comments
   Any additional comments from the project team which may be useful for resolving or documenting the issue
9. Resolution
   A description of what was performed to resolve the issue

The issues should be made available and editable to all project resources. This will ensure that the issues will remain active and visible as long as they are unresolved. This way, anything that can affect the project's benefits [Hallows 1997] is instantly visible to all project resources and can be addressed immediately. Any issues that are closed should be moved from the list of active issues and archived. Any high-priority issues, issues with a priority of 7+, should be listed on the weekly status report. This will allow all resources to see the highest priority issues documented.

18.5 Conclusion

When health care systems are managed properly, they can produce fantastic projects that will benefit not only the project stakeholders, but also the community at large. Efficient management of health care information systems will provide opportunities for further expansion of services and features to patients. The challenges presented by managing multi-departmental projects must not be underestimated, though. The complications associated with ensuring that all teams are striving toward and achieving goals can be quite challenging. With this in mind, incidents, such as the summer 2008 outbreak of salmonella, which was tracked back to tainted peppers, were able to be collaboratively tracked between states because of the systems set into place by health care projects. In this incident, the state of New Mexico was able to communicate information to the Centers for Disease Control and Prevention in Atlanta [Aubrey 2008], a feat that may not have been possible only a few years earlier. The collaborative efforts of multiple management teams were able to produce a system that spanned multiple departments and systems. Teams using various technologies were able to integrate and communicate. In the end, lives were saved, which exemplifies how effective health care management can result in, not only the success of a project, but the preservation of health.

Acknowledgment

The assistance and mentoring provided by Lee Prosch, Managing Partner with Prosch Consulting, to participate and provide managerial insights is acknowledged.

References

Asprey, Len and Michael Middleton. *Integrative Document and Content Management: Strategies for Exploiting Enterprise Knowledge.* Hershey, PA: Idea Group Inc., 2003.

Aubrey, Allison. *How Salmonella Investigation Shifted to Jalapeno.* July 22, 2008. http://www.npr.org/templates/story/story.php?storyId=92768085 (accessed November 15, 2008).
Bass, Len, Paul Clements, and Rick Kazman. *Software Architecture in Practice:* Second Edition. Boston: Addison-Wesley, 2003.
Bates, Seth, and Tony Smith. *SharePoint 2007 User's Guide: Learning Microsoft's Collaboration and Productivity Platform.* New York: Apress, 2007.
Craig, Rick David, and Stefan P. Jaskiel. *Systematic Software Testing.* Norwood: Artech House, 2002.
Freire, Mário Marques, Prosper Chemouil, and Pascal Lorenz. *Universal Multiservice Networks: Third European.* Berlin: Springer, 2004.
Grey, Clifford, and Erik Larson. *Project Management: The Complete Guide for Every Manager.* New York: McGraw-Hill, 2002.
Hallows, Jolyon. *Information Systems Project Management: How to Deliver Function and Value in Information Technology Projects.* New York: AMACOM Div American Mgmt Assn, 1997.
Kimmons, Robert L., and James H. Loweree. *Project Management: A Reference for Professionals.* New York: Marcel Dekker, Inc., 1989.
Liff, Stewart. *Managing Government Employees: How to Motivate Your People, Deal with Difficult Issues, and Achieve Tangible Results.* New York: AMACOM Div American Mgmt Assn, 2007.
Lima, Sara N. Di, Lisa T. Johns, and Joan Gratto Liebler. *Practical Introduction to Health Information Management.* Gaithersburg, MD: Jones and Bartlett Publishers, 1998.
Pennypacker, James S., and Lowell D. Dye. *Managing Multiple Projects: Planning, Scheduling, and Allocating Resources for Competitive Advantage.* New York: Mercel Dekker, Inc., 2002.
Phillips, Joseph. *IT Project Management: On Track From Start to Finish,* Second Edition. Emeryville: McGraw-Hill, 2004.
Pyzdek, Thomas. *The Six Sigma Handbook: A Complete Guide for Green Belts, Black Belts, and Managers at All Levels.* New York: McGraw-Hill Professional, 2003.
Roach, William H., et al. *Medical Records and the Law.* Sadbury: Jones and Bartlett Publishers, 2006.
Rozovsky, Fay Adrienne, Maree Bellamy, and James R. Woods. *The Handbook of Patient Safety Compliance: A Practical Guide for Health Care Organizations.* San Francisco: Wiley, 2005.
Stewart, Rodney D., Richard M. Wyskida, and James D. Johannes. *Cost Estimator's Reference Manual.* Wiley-IEEE, 1995.
Tropman, John E. *Making Meetings Work: Achieving High Quality Group Decisions.* Thousand Oaks, CA: Sage, 2003.
Wheeler, Neil, and Diana Grice. *Management in Health Care.* London: Nelson Thornes, 2000.
Wysocki, Robert K. *Effective Project Management.* Indianapolis: Wiley Publishing, Inc., 2007.
Linda E. Swayne, W. Jack Duncan, Peter M. Ginter. *Strategic Management of Health Care Organizations.* Malden: Blackwell Publishing, 2006.

Appendix A: Sample Status Report

Client A Project Pilot: Project Status 12/21/2009–12/28/2009

December 26, 2009

Summary

1. Proof of Concept development is complete and has been verified on 12/18/2008
2. Proof of Concept application has been uploaded and configured on the BizTalk Production environment
3. Uploaded the Proof of Concept Support Document
4. Uploaded the Source Code documentation
5. *Use case changes*
   - None this week

6. *Project plan changes*
   - None this week
7. *POC design document updates*
   - None this week

This Week

There are no expected updates for this week

High-Priority Issues

ID	*Issue description*	*Next Action*
100	We do not have a complete month of data. The POC cannot be fully evaluated without it. Project schedule could be compromised if data is not obtained by 1/2/2009.	Action #17 below

Action Items

ID	*Action Item*	*Next Action*
14	A test HL7 result needs to be filed into the application.	Client A Resource
17	Client A will follow up with Vendor to request a full month of data.	Client A Resource
18	Schedule meetings (ensure hardware and personnel are available) POC functional demo Tentatively Scheduled for December 18th December 30th is the alternate date POC validation and acceptance Knowledge Transfer Production Requirements gathering	Complete

Milestones

Due Date	*Task*	*Status*
10/6/2008	**Requirements Analysis, on site analysis and POC Plan**	
	Use Case document	Complete
	POC development plan	Complete

Milestones (continued)

Due Date	*Task*	*Status*
11/24/2008	**POC Design, BizTalk setup review, existing design review, test procedures**	
	Recommendations for BT setup	Complete
	Recommendation to design docs	Complete
	POC design document	Complete
	Test Procedures document	Complete
1/5/2009	**POC Dev, collaborate with staff, environment setup, demo, support doc, source code**	
	POC dev and support document	Complete
	Assist in environment setup	Complete
	POC functional demo	Complete
	POC source code	Complete
1/19/2009	**POC validation and acceptance, test, troubleshoot, checklist**	
	System testing and troubleshooting	On Track
	Checklist document	On Track
	Final system installed and configured	On Track
2/16/2009	**POC docs, knowledge transfer, support plan, final source code, all related files**	
	updated requirement and use case doc	On Track
	updated POC design doc	On Track
	updated POC dev and support doc	On Track
	updated testing documentation	On Track
	2 copies of updated final source code	On Track
	On site knowledge transfer	On Track
	Support plan	On Track
2/28/2009	**Final Report, Retainage release**	
	closeout report summarizing all deliverables	On Track

Appendix B: Sample Spreadsheet for Tracking Issues

Issue/Task	*Date opened*	*Issue Raised By*	*Next Action By*	*Priority*	*Scheduled release*	*Status (Open, Closed)*	*Comments*	*Resolution*
Log when the interface was first started and stopped	2/23/2009	MTS	KO	6	3/16/2009	Closed		Done
For MLLP Receive, allow to write received messages to the file system	2/23/2009	MTS	KO	8	3/16/2009	Closed		Now the user has the ability to save the messages wherever they want
For Mllp submit, allow capture of received acknowledgment	2/23/2009	MTS	KO	8	3/16/2009	Closed		The user can now choose the directory where they want the Acks saved to. This functionality has been added to both the regular mllp and sqlmllp. It has yet to be tested in sql mllp
Document all Classes	2/23/2009	MTS	KO	5	4/6/2009			
Document all Methods	2/23/2009	MTS	KO	5	4/6/2009			

Log output inefficient, freezes user interface while getting contents	3/13/2009	KO	KO	8			The log tab seems to freeze around the time it is trying to display the data	
For MLLP Receive, capture all received messages into a buffer; may need to truncate to N (5 KB max) bytes for size	2/23/2009	MTS	KO		4/6/2009	Closed	Isn't this the same as writing them to the filesystem?	

Chapter 19

Management Applications of Statistical Analysis Software

T. R. Carr

CONTENTS

19.1 Management and Statistical Software

The use of statistical software packages has the ability to provide public managers with a valuable tool when making decisions concerning the effectiveness of policies and programs within their agency or department. Managers are afforded the opportunity to record data, engage in analysis, and document specific areas of effectiveness or areas in need of improvement. The ability to assess and demonstrate program effectiveness is especially important during periods of fiscal stress accompanied by competition for limited financial recourses.

Effective communication of results is an integral component of policy analysis or program evaluation activities. The graphing capabilities of packages such as SPSS and SAS allow results to be presented in a variety of visual formats. This provides managers with the ability to indicate not just the results of an analysis, but how those results were obtained. Perhaps one of the greatest strengths of statistical software packages is their ability to extract information from data and to present that information in a format that can be readily communicated to others.

Statistical software provides managers with the ability to handle information necessary for a variety of functions such as evaluation, planning, and control. Consequently, it is helpful to note that a distinction exists between data, information, and intelligence. Data is best defined as the raw material that is mined and refined to produce information the manager can use and apply in the decision-making process. Intelligence can then be defined as the result of combining information from a variety of sources (such as quantitative analysis, organizational goals and mission, political values, and legislative or executive mandates) to arrive at appropriate policy decisions.

This means that statistical software is best viewed in the context of a decision support system (DSS) as opposed to a management information system (MIS) [Phillips-Wren et al., 2009; Thierauf, 1993]. A DSS is characterized by flexibility and adaptability appropriate for specific situations. The emphasis tends to center on planning and effectiveness, with models that focus on logic, judgment, and probability. DSS applications have been documented in a wide range of applications [Keffer et al., 2002]. Energy applications include such areas as environmental risk, production strategies, and technical choices. Medical applications include decision-tree analysis in the selection of treatment protocols for patients. Military applications include development of models for the "best mix" of various weapons systems in developing requests for proposals in the acquisitions process. Potential applications of DSSs in the field of public policy are both varied and wide-ranging.

DSSs are validated by the "appropriateness" of the analysis that is produced. An MIS is characterized by a structured flow of data, with models that focus on a fixed logic and a standardized general format designed to produce standard reports. MISs tend to focus on exactness and have what might be described as a classical systems approach to inputs, and outputs [Edwards and Finlay, 1997; Heeks, 1998]. In terms of the relationship between an MIS and a DSS, a DSS may often utilize data from an MIS to generate information for managers. As a DSS, a statistical software package is related to an organization's MIS but has a unique function concerning data analysis.

Spreadsheets also serve to function for managers as a DSS. Spreadsheets are subject to a wide range of errors. Two of the most common involve errors in data entry and errors with computational formula. These types of errors have the potential to produce both financial losses as well, and degrading the quality of decision making. Managers with a desire to improve the operations of their agency and enhance their decision making ability should understand the nature and extent of potential weaknesses associated with spreadsheet analysis [Powell, Baker, and Lawson, 2008].

19.2 Managerial Activities

The role of statistical software in the administrative process is influenced by the managerial environment in which it will be used. The environment is important because it provides a framework for insights into the potential inherent in statistical software as an aid in the decision-making

process, as well as an awareness of the limitations of their use for public managers. This preliminary discussion has two primary goals. The first is to acknowledge that the use of statistical software in the context of the activities in a manager's life is relatively limited. The second is to indicate that statistical software does have an important role in the administrative process, and that the effective manager adopts and adapts this software into the wider context of managerial activities [Finlay, 1994; Edwards and Finlay, 1997].

Most managers do not conduct statistical analyses but are consumers of the research and analysis conducted by specialists within the organization [Meier, Brudney, Bohte, 2009]. How does technical analysis such as that produced by a statistical software package fit into the decision-making process of managers? Much of the work of executives is *ad hoc* in nature [Buckholtz, 1995]. Traditionally, MISs have been applied to tasks that are repetitive and routine in nature. While this type of information is helpful, managers also need access to analysis that is not routine in nature. Managers also display a receptivity to information that is both verbal and visual or graphic in nature. This is where statistical software has the ability to enhance the decision-making process through flexible analysis and the capability to generate high-quality graphs that can clearly communicate information to the manager.

Accuracy and trustworthiness of information enhance the decision-making process. Statistical software allows analysts to present measures of uncertainty, such as standard deviation or confidence intervals, as an integral component of the analysis. This allows managers to understand limitations associated with the data analysis and to evaluate the overall trustworthiness of the analysis.

Meltsner [1976] developed a typology for understanding the roles and orientation of policy analysts in the public service. He stated that not all individuals classified as "analysts" possessed the necessary desire and skill to actually engage in analysis. In his typology, individuals were divided into categories based on the level of political and technical skills they possessed. Relatively few individuals were classified as "entrepreneurs," individuals with both high political and technical skills. Accordingly, most analysis is produced by "technicians," individuals with low political skills and high technical skills; or "politicians," individuals with high political skills and low technical skills; or "pretenders," individuals with low political and low technical skills. Meltsner's typology provides a cautionary note for managers: Know and understand the abilities of the analyst providing the information used in decision making. The output from statistical software may be impressive, but if it is the product of a "politician" or "pretender," the manager faces significant risks when relying on that analysis for decision making.

19.3 Statistics and Decision Making

Managers in the public sector are expected to engage in effective decision making. This means that managers are faced with a need to gather and analyze extensive information. For example, assume that a city manager is considering whether or not to recommend that a new employee training program be implemented in order to improve productivity. The manager needs a wide range of data: demographic information, indicators of employee productivity in the past, information on the costs of implementing the program (in both financial and human resource terms), as well as developing measures of the actual impact of the training program on productivity. Acquiring, compiling, and analyzing this type of information is the challenge faced by this manager. Statistical software packages can assist managers with these challenges as they engage in the decision-making process.

Statistics can be defined as the science and art of using quantitative data to make inferences that improve the quality of decision-making. The scientific component involves the mathematics associated with computation and with probability theory. The artistic component refers to the ability of the analyst to apply the scientific component to a real-world situation in which not all of the mathematical assumptions can be met and that is characterized by uncertainty and a persistent degree of "fuzziness."

The steps involved in using statistics for decision making generally adhere to the following pattern. As these steps are detailed, the relationship between the manager as decision maker and the analyst is revealed.

Formulate the Question — All statistical evaluations begin with questions to be answered. These questions must be directly related to the management issue of interest and have the ability to be operationalized, that is, structured into researchable terms. It is at this point that the decision maker and the analyst engage in discussions that allow questions to be structured in such a way that the needs of the manager can be met and at the same time be within the capabilities of the analyst.

Design the Study — At this phase of the analysis, issues relating to research design are addressed. What kind of data will be gathered, what will be the source of the data, what kind of data collection instrument will be used, what statistical tests will be used, what kinds of comparisons will be made, and to what extent will the results be generalized to the larger setting are the issues examined by the manager and the analyst?

Collect the Data — At this phase, the research design is implemented and data are collected for analysis.

Analyze the Data — Statistical software is used at this point to compute the specified statistics and develop a graphic presentation to accompany the analysis. At this stage, the results of the analysis are summarized for presentation to the decision maker.

Make Decisions — The manager as decision maker answers the original question in the context of the statistical analysis that has been conducted. It is at this point that the manager determines the level of confidence in the results of the analysis by formulating a plan for implementing the study.

Implement the Decision — This is the point of divergence between traditional academic research and applied research. In applied research, the manager makes appropriate decisions concerning the research results: whether or not to spend the resources to implement the program or policy. Applied research implies that a course of action is being considered, and that action will or will not be taken. It is at this point that budgets and professional reputations are placed at risk.

The application of statistical methods allows managers to reduce but not completely eliminate uncertainty in the decision-making process. The goal is to provide managers with the ability to make

an informed decision in the context of the results of a specific analysis. Statistical methods are then intended to facilitate disciplined decision making within the parameters specified in the research process itself. Statistical methods do not lend themselves to the discovery of absolute truths but, rather, to the discovery of a sufficient level of confidence that can be applied to the decision-making process.

19.4 Guidelines for the Use of Statistical Packages

Statistical software packages—SPSS and SAS are two examples—have the potential to serve as a valuable DSS for public administrators. Spreadsheets such as Excel have traditionally been characterized as being better tools than statistical packages for such functions as data entry, data editing, and printing [Grafton and Permaloff, 1998]. That advantage is not as great as in the past, with the advances made in the more recent releases of SPSS and SAS. Data entry and editing are in the form of a spreadsheet, with columns representing variables and rows representing cases. This structure brings more of an intuitive feel to the process than with early SPSS/PC versions with their formidable batch processing format. In fact, this ability to clearly and easily label variables and values within statistical software packages exceeds the capacity of spreadsheets, even though printing of data files remains somewhat cumbersome.

19.4.1 Characteristics and Capabilities of Statistical Software

With SPSS, for example, the analyst can supply a brief eight-character variable name (such as: jobsat), a longer descriptive variable label (such as: "Respondent's reported level of job satisfaction"), value labels to clearly identify the meaning of data entered (such as: 1, low; 2, moderate; 3, high), as well as indicate the level of measurement (nominal, ordinal, or interval/ratio) for future reference.

Data analysis with major statistical packages is now menu-driven with the advantages of point and click mouse operations. On the positive side, it is no longer necessary to remember complex syntax commands and formula to obtain output. The software package now performs these routine tasks through the use of the mouse. On the negative side, it is now very easy for a beginning-level analyst to engage in rather sophisticated statistical analysis without fully understanding the options and selections used to create the analysis. Ease of use, by definition, facilitates potential misapplication of statistical techniques.

Today, desktop statistical software packages are relatively fast and efficient programs. Satisfactory performance can be obtained from any most relatively inexpensive desktop computer. With this type of system, an analyst can analyze a virtually unlimited number of variables and cases. Statistical software packages can be linked easily with other data formats, such as spreadsheets or databases, to either import data for statistical analysis or export data for inclusion into a different format. This means that significant managerial flexibility exists in the use of statistical software packages.

One potentially important capability of a statistical software package is its ability to generate random samples from large databases. Both simple random and stratified random samples can be drawn from large databases with a few clicks of the mouse.

Perhaps the greatest advance in recent versions of most statistical software packages is the nature, quality, and ease with which publication-quality graphs can be created. Data analysis is enhanced through the use of appropriate charts and graphs.

19.4.2 Guidelines for Selection and Use of Statistical Analysis Software

Polhemus [2009] identified factors to guide managers in the selection of statistical software packages for their organizations.

- Background of the operator/analyst. The level of analytical sophistication and programming skills affects selection. High levels of skill in these areas allow the selection of a package with significant opportunities for program manipulation. Programs such as Stata and SAS are just two such statistical software options.
- Type of data utilized. Managers in the public sector encounter different types of data: survey data, financial data, engineering-related data, as well as production related data. The type of data required for the analysis has an impact on the optimum type of software package. Not all packages provide the same capabilities.
- Type of analysis desired. Determining in advance the type of analysis impacts on software selection. Varying packages have differing strengths in terms of producing descriptive statistics and accompanying charts and graphs as compared to needs for either advanced multivariate statistical techniques or more exploratory approaches such as data mining from large databases.
- Presentation of results. Determining, in advance, the target audience, the most appropriate format for presentation of results, and the level of sophistication of the intended recipient impact on software selection. Managers will enhance their effectiveness by understanding that statistical packages have differing strengths in terms of presenting output.
- This means that managers should adopt statistical software that is specific to their own unique situation and needs, and avoid the pitfall of believing that one single package will always be appropriate for their needs.

Finlay [1997] developed a series of guidelines for the use of software in managerial decision making. These guidelines can also be applied to the use of statistical software, with only slight modifications.

As the importance of the issue under investigation increases, so does the value of statistical software. When a problem or an issue has the potential to consume significant resources of an agency, the benefits to management of statistical analysis expand significantly. When the issues are relatively small, the benefit of statistical analysis as a management tool decreases considerably.

As the number of actors involved in the decision-making process increases, the value of statistical analysis also increases. Statistical analysis provides managers with a disciplined framework for asking questions, gathering data, and arriving at decisions. Statistical analysis serves as a mechanism for creating structure for debate over the policy options under consideration and establishing a common framework for evaluating options.

As the complexity of an issue increases, the value of statistical analysis increases. Statistical analysis serves the crucial function of reducing large numbers of variables into a limited number of factors in order to increase comprehension. Statistical analysis has the capability of identifying the underlying structure of a large array of data. This characteristic increases the value of engaging in statistical analysis.

The greater the value placed on analysis within an agency, the greater the value of statistical analysis. Agencies have differing values concerning the analytic process. If an agency lacks a commitment to quantitative analysis, the value of statistical analysis decreases significantly. An agency or manager that understands and values quantitative evaluation will derive a greater benefit from statistical analysis.

The greater the impact of political factors, the less the potential value of statistical analysis. Statistical analysis has a much lower value when policy or management issues are determined or are heavily influenced by political pressures than when political values have less influence. Statistical analysis serves to structure the debate surrounding policy or management options in the context of an established framework of analysis. The political process may be contrary to this rational framework, which acts to minimize the utility of statistical analysis.

19.5 Significance Levels

In the context of applied public administration research, tests of statistical significance provide one criterion against which the validity of findings can be judged. The proper interpretation of statistical significance ought to be a major concern for both analysts and administrators. This is especially true as statistical software packages are widely utilized in program evaluation and policy analysis efforts. Applied research is intended to improve the decision-making process by providing insights and guidance to both administrators and elected officials [Quade, 1982]. Consequently, decisions to adopt programs, terminate programs, and the selection of optimum program levels are based on statistical significance tests.

19.5.1 Significance Tests

Statistical significance is a measure of the willingness of the analyst to make a type I, or alpha error, which involves the rejection of a true null hypothesis that either "no difference" or "no relationship" exits. The .05 alpha level indicates that the analyst is willing to incorrectly reject a true null hypothesis and indicate that a difference or relationship exists in error of up to 5 out of 100 times. A type II, or beta error, occurs when the analyst fails to reject a false null hypothesis. An inverse relationship exists between the two types of errors. As the probability of making a type I error is decreased (by the selection of a lower alpha level such as .001), the probability of making a type II error is increased. For managers, the selection of a specific level of statistical significance involves the evaluation of the trade-offs between the consequences of a type I and a type II error. The use of significance tests allows analysts to eliminate sampling error in explaining differences observed in sample statistics. These tests are most appropriate when applied to data generated by true experimental research designs.

In the social sciences, .05 emerged as a "sacred" alpha level [Skipper et al., 1967; Labovitz, 1968]. This alpha level is the product of human cognitive processes and the evolutionary process in the development of inferential statistics [Cowles and Davis, 1982]. Before the development of standard deviation, the notion of probable error (PE) was widely used. PE was used to indicate the range, above and below the mean, which contained about half of the observations in a distribution. The standard of three PEs was widely used as an appropriate guide to determine chance occurrences. Because one PE is about two-thirds of a standard deviation, three PEs are approximately two standard deviation units. This translates into roughly 95% of the area under the normal curve, which is consistent with the .05 alpha level. Even though the standard deviation replaced PE, a continuity remained with the widespread adoption of the .05 alpha level.

The .05 alpha level is also consistent with the cognitive process of living in a base-10 math system. Being 95% confident seems to be a reasonable standard. A desire for higher levels of confidence is easily expressed as 99% or 99.9%, which is equivalent to the .01 and .001 alpha levels, respectively. Consequently, the .05 level is easily complimented by .01 and .001 alpha levels.

There is something that is not cognitively appealing about other levels of confidence such as 87% or 97.6%. The convention of .05 and its extension to .01 and .001 seem more acceptable to the cognitive process.

Because these three alpha levels are the product of convention and a need to be cognitively consistent with a base-10 math system, they are probably quite arbitrary standards against which differences are to be judged. Managers should remember that analysts using statistical software tend to rely on conventional alpha levels of .05, .01, and .001 and that these may not be the most appropriate for making informed decisions.

19.5.2 Misinterpretations of Significance Tests

Statistical tests produced by software packages are subject to a number of inaccurate interpretations. Managers need to be aware of these misinterpretations as they receive statistical output for use in the decision-making process.

"The Hypothesis Is Proved" Misinterpretation — It is not accurate to state that a significance test proves a hypothesis. It is only one step in a process of gathering evidence to assess support for a hypothesis [Winch and Campbell, 1969]. It is tempting to interpret significance tests as *P* (HE), that is, the probability that the hypothesis is true given the evidence. Yet this is an incorrect interpretation. The correct interpretation is *P* (EH), that is, the probability that the evidence would be produced if the null hypothesis of no difference were true. The focus of the test is on the probability of the evidence, not of the hypothesis [Carver, 1978].

"Degree-of-Significance" Misinterpretation — When a given alpha level is interpreted as providing information on the degree of significance, this error is made [Gowger, 1984]. An example is stating that a difference statistically significant at the .05 level is "significant," at the .01 level is "very significant," and at the .001 level is "highly significant." Managers are advised to remember that a difference is either significant or not significant at any given alpha level. Alpha levels measure the probability of making alpha errors, not the degree of significance. When this misinterpretation is made, the fact that the probability of a type II error increases as alpha level decreases is ignored.

The "Measure of Association" Misinterpretation — This is similar to the degree of significance error and occurs when a conclusion concerning the strength of a relationship is made by comparing alpha levels. Statements that a relationship significant at the .01 level is "stronger" than one at the .05 level are a misapplication of statistical significance tests. A range of statistical tests exists for measuring strength of relationship after statistical significance is evaluated.

The "Substantive Significance" Misinterpretation — Substantive significance implies that a relationship is important for policy or program evaluation. Statistical significance in itself is not a complete guide to practical importance. Managers are cautioned to remember that substantive significance is assessed by examining the magnitude of the relationship, the strength of the relationship, and the relevance of the issues to the research questions under investigation. It is possible to find that a statistically insignificant finding may be of substantive importance to decision-makers.

19.5.3 Guidelines for Managers

The proper interpretation of statistical tests produced by statistical software is essential if the research findings are to be of genuine value to managers. A number of guidelines exist that enhance the ability of managers to use the results of significance tests in applied research efforts.

Evaluate Assumptions — Significance tests require that certain assumptions be met for their proper use (such as level of measurement, population distribution, nature of sampling). When these assumptions cannot be met, analysts are often willing to relax assumptions and still use the statistical test. With the relaxation of assumptions, potential threats to the validity of the findings are introduced. The robustness of the test statistic becomes an issue. Robustness is a measure of the ability of a statistic to maintain its validity when assumptions are relaxed. It may be possible to relax one assumption with little impact, but when two or more assumptions are relaxed, a marked decrease in robustness will probably result [Labovitz, 1967].

Statistical Power and Sample Size — The power of a test is the measure of the ability of the test to reject the null hypothesis. Power is a function of the class of the statistic (parametric or non-parametric), sample size, and level of statistical significance. One method to increase statistical power is to increase sample size. If a sample is sufficiently large, small differences become statistically significant. In smaller samples, the magnitude of the difference must be greater to achieve statistical significance. Managers are advised to evaluate the impact of sample size on statistical significance.

Use Descriptive Statistics — Descriptive statistics have the ability to summarize the data and provide an understanding of the underlying structure in the data. A cursory discussion of the mean or standard deviation does not permit a thorough understanding of the distribution of the data. Greater emphasis on a variety of descriptive statistics would probably be useful. Managers are advised to rely on inferential statistics only after the structure and patterns within the data are clearly understood.

Evaluate Consequences of Type I and Type II Errors — The manager should evaluate the managerial and policy consequences of both rejecting a true null hypothesis and failing to reject a false null hypothesis. This will involve an evaluation of the consequences of acting after having made either error. Alpha levels should be selected after the consequences of making a beta error are evaluated and understood.

Evaluate the Magnitude of the Relationship — Even if a relationship is statistically significant, the magnitude of the relationship requires evaluation. Relationships that are small in magnitude may be judged as having no real importance for managers.

Evaluate the Relevance of Academic Standards to Applied Research Efforts — Applied research is targeted to a different audience with a different objective than traditional academic research. A study investigating quality of life for publication in an academic journal illuminates our understanding of human values. The same study conducted for a city council may

result in changed spending patterns and other policy impacts. Consequently, academic standards may not be relevant.

Managers are advised to remember that the goal of applied research is to improve the quality of decision-making and that the decision to employ significance tests and the selection of alpha levels merit extensive consideration. The guidelines presented in this section help provide a framework for the appropriate application of significance tests.

19.6 Applications of Statistical Software Programs

Public managers have collected large volumes of data and have access to a range of data sources that have the potential to improve operating efficiency and effectiveness. Applications of statistical software have expanded as additional analytic techniques have been integrated into the software. This has led to a range of creative applications that have improved government operations. One such application involves aligning government resources and capabilities with adopted policies and programs in order to improve government operations [Goren et al., 2008]. Four areas of application suitable for the application of statistical software were identified. These include resource misalignment, in which personnel, finances, equipment, and existing program operations may be misaligned with adopted agency policy and strategy; outside-influence misalignment, in which government agencies have become out of sync with their constituents due to possible inappropriate accommodation with external groups that resulted in mission shifts; financial misalignment, in which internal budgeting priorities are in conflict with adopted agency strategies; and strategic misalignment, in which individual units within the agency or department are pursuing policy and program options that are inconsistent with agency strategy.

Applications of statistical software expand as additional analytic techniques are integrated into the software. The increased integration of "data mining" techniques into statistical packages such as SPSS and SAS has increased the capability of public managers to improve decision making as patterns in existing data are identified. One such example is the adoption of SPSS Clementine data mining module to predict property crimes and reduce the risk of an escalation to violent crimes against individuals. Data mining procedure, developed by SAS, allows financial institution to monitor transactions in order to identify potential money laundering activities that might violate the Patriot Act as enacted by Congress [SAS, 2002; Callaghan, 2003].

Applications of statistical software packages continue to expand as managers require more information on program and policy decisions. One such example is activity-based management (ABM) as developed by SAS [Fabian, 2002]. ABM involves the integration of financial, operational, and performance data in order to improve planning, budgeting, and operational decision making. As demands on public-sector managers increase with the expectation of providing more services at a reduced cost, there continues to be an evolution of the capacity of statistical packages to incorporate more analytic techniques. At the same time, statistical analysis packages are being increasingly merged with decision support systems as managers ask increasingly complex questions [Babcock, 2001].

Data mining statistical techniques have significant utility to administrators in higher education [Luan, 2002]. Administrators can avoid being tied to conventional wisdom and answer with increased confidence questions relating to: Which students will take more credit hours? Which students are likely to complete their degree program? Which alumni are more likely to contribute?

What courses or degree programs are more likely to attract students? As these and other questions are answered, administrators can more effectively allocate financial and academic resources in order to achieve their goals.

Statistical software applications include the ability to address issues of fraud and waste within government [Mariana and Dorrington, 2005]. Specific applications include analysis of: payment patterns to detect fraud; collection patterns in order to optimize revenue; and internal control policies and procedures in order to minimize the possibility of fraud and abuse while improving efficiency.

Operation of the court system can be improved through the application of statistical techniques [Coyne, 2006]. Areas in which operations have been improved include: case management, optimization of court dockets, improved utilization of technology, and the ability to asses outcome impacts on court operations.

Managers in the public sector today find that funding is increasingly tied to measurable, quantifiable results. At the same time, public agencies are collecting and warehousing more and more data that can be utilized in a variety of statistical routines and procedures. Statistical software has the potential to allow managers to improve the quality of decision making and to increase the level of confidence in those decisions. Some typical applications might include:

- Public safety: crime incident analysis, court sentencing analysis
- Revenue: property taxation assessment
- Public health: epidemiological studies investigating distribution of diseases, Medicare service utilization
- Fraud: use of data mining to detect Medicare misuse
- Environment: water and air quality analysis
- Strategic planning: economic forecasting and analysis, labor force utilization

Given the ability of statistical software packages such as SPSS and SAS to import data from a variety of formats, in-depth analysis can now be achieved without engaging in expensive data conversion tasks.

A basic reason for engaging in statistical analysis is to reduce uncertainty in the decision-making process. Through the use of statistical software, managers have a tool that will allow them to assess program performance and make appropriate responses.

19.7 Comparison of Statistical Software with Spreadsheets

Given the fact that spreadsheets provide managers with the ability to conduct statistical analysis, should managers consider adopting a statistical software package to engage in analysis? The answer to this question is yes, because of additional data analysis capabilities possessed by statistical software:

- Statistical software now typically has an array of graphs available to illustrate the underlying structure of the data. In addition to traditional bar, scatter, and pie charts, statistical software includes other options such as boxplots, control charts, Pareto charts, etc., to facilitate communication of results to others.
- Statistical software programs provide managers with a wide array of statistical tests, which allow them to asses what is really important. The statistical tests available with spreadsheets may be sufficient for financial analyses but many managerial questions are not financial

in nature and require statistical analysis of a variety of demographic, attitudinal as well as financial data.

- Statistical software packages such as SPSS and SAS have significant data management capabilities not found in spreadsheets. Data files can be merged, separated into smaller files, and aggregated with minimal effort. One significant advantage is the ability of software packages to recode data into different values when categories are combined or scales are created. With the ability of software packages to include extensive variable labels and value labels, confusion about the interpretation of numerical data is minimized or eliminated completely.
- Statistical software packages have a greater flexibility in handling missing data than do spreadsheets. Missing data typically fall into a range of responses from non-response, to "don't know," to "not applicable." Statistical software allows managers to differentiate between these categories and to identify cases with missing data for follow-up analysis if necessary.
- Statistical software packages such as SPSS have built-in statistical glossaries and tutorials to provide the manager with information with the click of a mouse button. This feature saves time and provides essential statistical information quickly and easily.
- Statistical software has the capacity to expand as data analysis needs expand. This is an important feature in that managers can purchase additional statistical modules only as they are required, a feature that contributes to financial savings. Through the use of add-on modules managers can reduce the financial cost of the software by acquiring only those that are actually necessary for the evaluation effort.
- An increasing number of statistical analysis "add-ons" are available for spreadsheets programs such as Microsoft Excel. These additional modules have somewhat reduced but not eliminated the difference in the capabilities between spreadsheets and dedicated statistical software packages.

Statistical software will not, and should not, replace spreadsheets for managers but serve as an effective complement to them. Spreadsheets are very effective for financial analysis and other similar tasks. Statistical software provides managers with a significantly expanded capability to engage in analysis of a wide range of types of data that can reduce uncertainty in the decision-making process.

References

Babcock, J., 2001. *Best practices approach to government technology solutions*, Cary, NC: SAS Institute.

Buckholtz, T.J., 1995. *Information proficiency: Your key to the information age*, New York: Van Nostrand Reinhold.

Callaghan, D., 2003. Law enforcement: Analytic detective work, *EWEEK*, September 1:30–31.

Cowles, M. and Davis, C., 1982. On the origins of the .05 level of statistical significance, *American Psychologist*, 37, 553–558.

Coyne, R., 2006. *Current trends in American courts—Leveraging technology to overcome challenges and advance opportunities.* Cary, NC: SAS Institute.

Edwards, J.S. and Finlay, P.N., 1997. *Decision making with computers*, Washington, DC: Pitman.

Fabian, A., 2002. *Activity based management in the public sector*, Cary, NC: SAS Institute.

Finlay, P.N., 1994. *Introducing decision support systems*, Cambridge, MA: Blackwell.

Gloudemans, R. and Almy, R., 2002. *More defensible values with statistics*, Chicago: SPSS, Inc.

Gold, D., 1969. Statistical tests and substantive significance, *American Sociologist*, 4, 378–399.

Gowger, C.D., 1984. Statistical significance tests: Scientific ritualism or scientific method? *Social Science Review* 4: 358–372.

Goren, B., J. Lemon, G. Bamford and L. Durham., 2008. *Aligned Government.* Cary, NC: SAS Institute.

Grafton, C. and Permaloff, A.,1998. The software toolkit approach for public administrators, in *Information technology and computer applications in public administration*, Garson, G.D., ed., Hershey, PA: Idea Group.

Heeks, R., 1998. Management information systems in the public sector, in *Information technology and computer applications in public administration*, Garson, G.D., ed., Hershey, PA: Idea Group.

Keefer, D.L., Kirkwood, C.W., and Corner, J.L., 2002. *Summary of decision analysis applications in the operations research literature, 1990–2001*, Technical Report, Department of Supply Chain Management, Tempe, AZ: Arizona State University.

Labovitz, S., 1968. Criteria for selecting a significance level: note on the sacredness of .05, *American Sociologist*, 3, 220–222.

Luan, J., 2002. *Data mining applications in higher education*, Chicago: SPSS, Inc.

Mariani, G. and Dorrington, P., 2005. *Combating improper payments, fraud, waste and abuse.* Cary, NC: SAS Institute.

Meier, K.J., J.L. Brudney, and J. Bohte. 2009. *Applied statistics for public and nonprofit administration.* Belmont, CA: Thompson.

Meltsner, A.J., 1976. *Policy analysts in the bureaucracy,* Berkeley: University of California Press.

Mintzberg, H., 1975. The manager's job: Folklore and fact, *Harvard Business Review*, July–August, 49–61.

Phillips-Wern. G., M. Mora, G.A. Forgionne, and J.N.D. Gupta. 2009. An integrative evaluation framework for intelligent decision support systems. *European Journal of Operations Research.* 195: 642–652.

Polhemus, N., 2009. Selecting statistical software for six sigma, *Quality*, 48, pp. 62–64.

Powell, S. G., K Baker and B. Lawson. (2008) A critical review of the literature on spreadsheet errors. *Decision Support Systems*. 46: 128–138.

Quade, E.S., 1982. *Analysis for public decisions*, 2nd ed., New York: Elsevier, New York.

SAS, Inc. 2002., *Anti-money laundering solution*, Cary, NC: SAS Institute.

Selvin, H.C., 1957, A critique of tests of significance in survey research. *American Sociological Review*, 22, 519–527.

Skipper, J.K., Guenther, A.L., and Nass, G., 1967. The sacredness of .05: A note on the uses of statistical levels of significance in social science, *American Sociologist*, 2, 16–18.

Thierauf, R.J., 1993. *Creative computer software for strategic thinking and decision making*, Westport, CT: Greenwood.

Winch, C.F., and Campbell, D.T., 1969. Proof? No. Evidence? Yes, the significance of tests of significance, *American Sociologist*, 4, 140–143.

Chapter 20

Public Safety Information Systems at Work: A Case Study of the Capital Wireless Integrated Network

Shaoming Cheng, Marc A. Thibault, and Roger R. Stough

CONTENTS

20.1 Introduction

In Hollywood movies, it is often portrayed that public safety officials and first responders in fire, police, emergency medical response, and transportation agencies, can communicate and share information with each other by simply using phones, radios, or computers. In reality, however, public safety officials and agencies have not always been able to communicate with each other effectively and, in some cases, they cannot communicate with each other at all. This communication difficulty results from a lack of institutional coordination and a lack of interoperable public safety communications systems. This inability to effectively communicate is a major national challenge because the United States, like the rest of the world, has come to rely on complex interdependent systems whose performance can affect the welfare of more then one political jurisdiction. This chapter studies the Capital Wireless Integrated Network (CapWIN) project in order to identify institutional conditions that may contribute to the successful deployment of similar public safety information and communications systems. CapWIN is the first multi-state and multi-agency public safety integrated wireless network in the United States. It responds to an increased public demand for improved coordination and information sharing between regional law enforcement, fire and rescue, emergency medical services, transportation agencies, motorist assistance services, and information service providers. The U.S. National Capital Region, also referred to as the Greater Washington Region, is described to provide an overview of the region in which CapWIN is being deployed. Recent major public safety events that demonstrated the importance of public safety interoperability in the National Capital Region are described to demonstrate how public safety incidents combined with the lack of interoperable public safety communications can hamper government efforts to respond to both major and minor public safety incidents. The CapWIN project is examined in greater detail to show how it has addressed the governance and technical challenges associated with developing an interoperable, multi-state and multi-agency public safety information and communications system.

20.2 National Capital Region and Its Major Public Safety Incidents

20.2.1 About the National Capital Region

The U.S. National Capital Region consists of the District of Columbia and 21 political jurisdictions in Virginia and Maryland* (Figure 20.1). The region's total area is 5,000 square miles, and it had an estimated population of 6.2 million by the end of 2007. Federal, state, and local governments employ about 750,000 U.S. National Capital Region residents while the private sector employs about 3.2 million [Greater Washington Initiative 2003]. The region specializes in Government services, Federal Contracting, Information Technology, Biotechnology and other professional services. The majority of the region's residents and jobs are found in the central jurisdictions and major edge cities of the U.S. National Capital Region. The U.S. National Capital region has experienced significant economic and population growth in the last 20 years. Between 1982 and 2002, it gained 1.15 million jobs and led the nation in job growth for this 20-year

* The central jurisdictions of the U.S. Capital Region include the District of Columbia and the following Maryland and Virginia counties: Montgomery, Prince George's, Arlington, and Fairfax. The edge cities include City of Alexandria, City of Falls Church, City of Rockville, and Fairfax city.

Figure 20.1 Political components and their jurisdictional boundaries in the region.

period, and between 1997 to 2007, the Region witnessed 721,000 net new jobs, which was the second largest growth in absolute terms following New York. The National Capital Region has one of the highest median household incomes in the nation. According to the Census Bureau's 2006 ranking of all 3,000+ counties in the nation, 11 of the top 25 jurisdictions are in the National Capital Region, and all counties in the Region are in the top 100.

There are several national transportation systems with their major links in the U.S. National Capital Region. Interstate I-95, I-70, I-66, U.S. 1, 301, and 50, and portions of the Eastern U.S. rail systems pass through the U.S. National Capital Region (see Figure 20.2). These surface links not only connect the New England and Mid-Atlantic states with the Southern U.S. states and with Mexico and Canada, but they also provide access to the Midwestern and Western states. In addition, there are several regional and local critical nodes in the Greater Washington's transportation infrastructure. The Capital Beltway (or "ring road," in European terms), I-495, serves as the primary link between the region's major roadways, including I-66, I-295, I-395, I-270, and I-95.

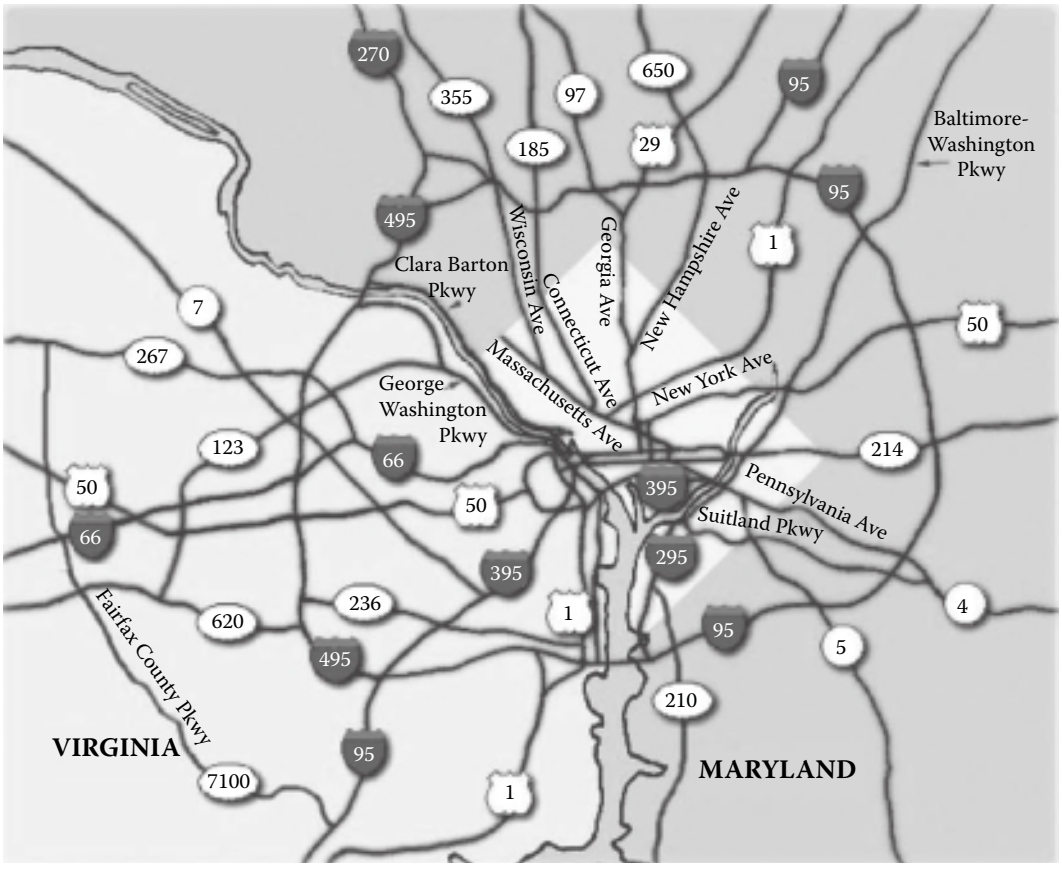


Figure 20.2 Transportation infrastructure in the National Capital Region.

The Region's northern road system and its southern road system are connected by six bridges. The Region has one metropolitan commuter rail system, Metro, and three suburban commuter rail systems, MARC, VRE, and AMTRAK. Further, the Region has three major airports, Baltimore Washington International, Washington Dulles International, and Reagan National Airport, which provide access to the rest of the United States and the world, and several private airports that serve aircraft up to Boeing 737 status.

The National Capital Region highway infrastructure improvements have not kept pace with the region's economic and population growth.* As a result, traffic congestion is a major policy issue. The percentage of congested freeways increased from 40% in 1982 to 70% in 2001.† Similarly, the percentage of congested principal arterial streets increased from 60% in 1982 to 75% percent in

* The U.S. Capital Region's first transportation plan included several transportation projects that were cancelled due to public opposition: an outer Washington beltway, a highway that linked Northwest DC to I-270 and a highway that connected Northeast DC to I-95, and a bridge that connected I-66 to the Georgetown section of the District of Columbia [Feaver 1999]. There is still intense opposition to major transportation projects in the region.

† The Federal Highway Administrations has indicated the Insufficient Capacity/Bottlenecks 40%, Incident Crashes 25%, Weather 15%, Construction 10%, Poor Signal Timing 5%, and Other nonrecurring events 5%, (*Washington Post* 2003)

2001. The average hours of travel delay has increased from 10 hours in 1992 to 34 hours in 2001. It is estimated that the annual cost of traffic congestion in the National Capital Region and the nation was $2,490 million [Schrank and Lomax 2003]. Elected officials, business leaders, and the general public have recognized the need for additional transportation infrastructure improvements, demonstrated by daily traffic congestion and in several public safety incidents, but have not been willing to fund them.

20.2.2 Woodrow Wilson Bridge Jumper Incident

CapWIN was originally inspired in 1998 when a Virginia resident threatened to jump into the Potomac River on the Woodrow Wilson Bridge. On November 4, 1998, at 1:07 PM, a 32-year-old Alexandria man stood on the edge of Woodrow Wilson Bridge and threatened to jump to his death. Due to the concern that he may have had a gun (and also that he may have been mentally unstable), the Bridge was closed for over 5 hours. The closing of the Bridge (190,000 vehicles pass over it every day) eventually caused traffic backups for 20 miles on the Capital Beltway. Within an hour, Beltway traffic leading to the bridge was backed up 8 miles in both directions. Police then closed all the entrance ramps to the Beltway's outer loop between the Bridge and Interstate 395 to clear the jam on the Virginia side, but that caused gridlock on other parts of the highway and secondary streets. By evening, Beltway traffic was stalled in both directions from Gallows Road to College Park and along much of I-395, I-295, and Route 50. Much of the National Capital Region was brought to a standstill with frustrated commuters stuck in the traffic for hours.

What made the incident even worse were the fragmented communications systems of first responders and consequently inadequate coordination during the incident. Police and transportation responders from the District, the states of Maryland and Virginia, the counties of Alexandria and Prince George's, and some federal agencies responded due to the Bridge's vital geographic location and, more importantly, the complex jurisdictions over the Bridge. The Woodrow Wilson Bridge spans the Potomac River, connecting Alexandria County, VA, and the Prince George's County, MD. The Bridge itself is federally owned and jurisdictionally belongs to the District of Columbia. The Potomac River under the Bridge, into which the jumper was jumping, falls under the jurisdiction of the State of Maryland (as well as the U.S. Coast Guard, depending on the action or activity); however, the jumper was on the portion of the Bridge closer to the State of Virginia. As a result, both transportation and police crews from federal, state, and local agencies responded and were on the scene. "[But] no one could talk with those from other agencies," the CapWIN Director, George Ake later recalled. He explained that "at that time, a message can only be transmitted from a responder of one agency to one of another agency through their respective dispatch centers" [personal communication, September 18, 2002]. Such fragmented, incompatible, and indirect inter-agency and inter-jurisdiction communication takes a tremendous amount of time and often creates considerable delays, particularly in cases like the Bridge-Jumper when every responder at the scene tried to contact his/her dispatch center in order to link up with their counterparts in other agencies and jurisdictions.

20.2.3 The Pentagon Attack

Although public safety and transportation agencies of the National Capital Region realized that shared communications needed to be improved among the various and sometimes

incompatible voice and data information systems run by local, federal, and state agencies, the Pentagon attack intensified the urgent needs for interoperable communications systems across agencies and jurisdictions. In the morning of September 11, 2001, American Airlines Flight 77 took off from Washington Dulles International Airport (IAD) to Los Angeles at 8:10AM. At 9:43AM, however, this routine and normal flight had been hijacked by terrorists and was deliberately used as a "missile" to hit the Pentagon. The airliner crashed low and diagonally into the limestone wall of a recently renovated wedge of the Pentagon. The impact of the direct hit and the fire caused by the fuel created a catastrophic structural failure of the wedge. Within minutes, the upper floors of the wedge collapsed and resulted in a 100-foot-wide gap.

After the Pentagon was struck, the Emergency Operations Center (EOC) of Arlington County, Virginia, where the Pentagon is located, immediately directed fire, police, and medical units of Arlington County to race to the scene. In accordance with the existing jurisdictional arrangement, Arlington County Fire and Police assumed scene command in the Pentagon rescue efforts. At the same time, EOC contacted its surrounding jurisdictions to request mutual-aid response based on pre-existing contingency plans and agreements. Numerous response units then headed toward the Pentagon and the Arlington County. The Arlington Police crews also started to re-route traffic in order to allow access for the arriving emergency response units from its nearby jurisdictions. It was estimated that 50 public safety agencies responded to the attack and were present at the scene.

The coordination and communication among these first responder units and crews, however, was far from satisfactory. One of the biggest issues was a dangerous lack of interoperability between the communications systems of emergency response agencies due to the traditional agency- or jurisdiction-based communications infrastructure. In other words, each agency or jurisdiction focused primarily on communication within its own agency (or jurisdiction boundary) in terms of what equipment, communication technology, and even radio frequency should be adopted. Since the technological configurations and radio frequencies are often different across agencies and jurisdictions, fire fighters, rescue workers and police could not always communicate on the same radio channel or frequency, and direct communication among different agencies and between agencies from various jurisdictions was extremely limited. For example, rescue teams from adjacent counties were unable to receive timely instructions from the Arlington Police on which road had been shut down or had been reserved for incoming first responder teams. As a result, many rescue vehicles had to wait at the Arlington County border for further instructions. Even worse, the first responder teams from adjacent counties, which managed to get to the Pentagon, could not communicate with Arlington County Fire and Police commanders, let alone be coordinated and effectively deployed into the ongoing rescue at the scene.

20.3 CapWIN Project History and Milestones

CapWIN evolved and developed as one of the solutions, if not the most important one, to the interoperability challenges faced by the public safety community of the National Capital Region. Interoperability is the ability of public safety personnel in different agencies or jurisdictions to communicate with each other by radio or other media on demand, in real time. Interoperability capability is critical because, in many cases, the impacts of a public safety incident are not confined within a single jurisdiction, nor can they be coped with by a single

agency. Instead, impacts often "spill over" into one or more neighboring jurisdictions and across agency disciplines. This spillover or externality effect, also described as a sense of "shared fate" or interdependence, is particularly relevant in the National Capital Region because federal, state and local jurisdictions and agencies are geographically in close proximity in this region. Cross-state interdependence in this context is the fundamental justification not only for the participation of the federal government, but also of fostering interstate cooperation in the region and the region-wide deployment of CapWIN. Communication interoperability that greatly facilitates cooperation and collaboration between jurisdictions and agencies is therefore a prerequisite capability for public safety agencies to effectively deal with incidents and mitigate their consequences.

CapWIN is one of the first multi-state and interagency integrated wireless communication networks in the United States. It was initiated in 1999 to integrate transportation and criminal justice communication networks, with initial funding from the Maryland State Highway Administration and the Virginia Department of Transportation to the University of Maryland Center for Advanced Transportation Technology (UMD-CATT). The primary goal of CapWIN is to develop a communications network that allows public safety officials and workers to communicate directly with each other regardless of their location or type of communications equipment. This goal, which CapWIN is rapidly approaching, represents a major advance in how public safety agencies operate in routine and emergency situations and has demonstrated its potential to help resolve the aforementioned interoperability challenges. Since its inception, CapWIN has been readily accepted by most of the local, state, and federal agencies in the National Capital Region in light of previous significant public safety incidents. Like other wireless network projects throughout the country, the CapWIN project allows data (and in the future, the possibility of voice and video imaging) communication between individual law enforcement and public safety vehicles responding to incidents or emergencies, or for law enforcement purposes. In addition to the vehicle-to-vehicle communications capability of CapWIN, the system also allows remote access to various national criminal and other databases, from vehicles in the field. Neither vehicle-to-vehicle communications nor database access requires that the user connect through a central dispatch facility. CapWIN is the first project of this sort to envisage a multi-jurisdictional, multi-discipline, and massively scaleable system.

During the strategic planning phase, priorities and needs of public safety agencies in the Region, particularly the transportation and law enforcement agencies, were first identified. The University of Virginia (UVA) and the International Association of Chiefs of Police (IACP) were asked respectively to survey transportation and law enforcement responders about the critical information they can and would like to have from their existing and future communications systems. At the same time, UVA and IACP were also asked to look at best practices nationwide in using wireless technologies in the transportation and law enforcement communities respectively. Those successful projects and wireless technologies were viewed as a likely foundation and as benchmarks for CapWIN, but with a clear intention to establish one of the first inter-agency and multi-jurisdiction integrated and interoperable communications networks in the United States. In March 2001, CapWIN released its request for a proposal (RFP) for a systems integrator to develop and set up its own necessary infrastructure. In August 2002, IBM was awarded the system integration contract, in the amount of $6.4 million, for CapWIN infrastructure and technology development.

In 2001, the CapWIN project was designated by the U.S. Department of Transportation (USDOT) as a program of national significance and selected as one of nine projects nationwide

for thorough evaluation.* USDOT has placed great emphasis on the dual promises of "integration" and "interoperability" that these projects may enable. All nine projects,† and particularly CapWIN, if built and managed properly, exhibit characteristics that will increase the capacity of technology systems to work together across multiple groups/jurisdictions. USDOT considered the nine designated projects as the most promising for filling information gaps on the benefits and costs of emerging and existing ITS technologies or for documenting newer, successful ways of doing business. It is hoped that the national evaluation effort will provide significant guidance for other related transportation and communications projects as they are designed and deployed across the country.

An early pilot deployment of CapWIN including more than 20 in-vehicle removable laptop units started in June 2001 and formally concluded in June 2002. It was expected that inferences could be drawn from the pilot evaluation for a broader evaluation of the larger network deployment in the multi-jurisdictional context. The pilot system evaluation offered an initial examination of several of the "ex-ante" evaluation issues (already in play) for the region-wide full deployment of CapWIN. The School of Public Policy (SPP) at George Mason University (GMU) was asked to conduct the pilot evaluation study and policy analyses for CapWIN deployment, along with providing institutional and governance recommendations for the CapWIN organization. From the outset, George Mason University had been deeply involved and had been an integral part of CapWIN efforts.

With regard to the governance structure of CapWIN, Maggio and Stough [2002] at SPP examined 12 governance options, including models and examples from across the country, along with their institutional, constitutional, organizational, and financial characteristics and dynamics. The forms of governance evaluated for the potential CapWIN governance structure fell into four general categories: government agencies (local, state, or federal), public authorities, corporations, voluntary consortiums, and cooperative agreement. There are several institutional factors that CapWIN is taking into account as it considers its future governance structure. CapWIN political membership consists of a federal district, two states, and over 20 local jurisdictions. CapWIN's governance structure should preserve the political decision making capabilities of each level of government. Otherwise, CapWIN, in effect, may become an un-elected policymaking body or its decision making may become dominated by one level of government. Either of these outcomes could have a detrimental effect on regional cooperation. In addition, CapWIN's potential users come from public agencies representing the federal, state, and local public safety agencies. Therefore, CapWIN must also ensure that it meets the institutional and technical needs of these different agencies. A failure to do this may also have a negative effect on the regional public safety cooperation that CapWIN is attempting to create. However, there is no organizational model that is directly applicable to CapWIN. Public safety is not a market good that can be assigned a market price. Therefore, this precludes organizational structures, such as a Transit Authority or Private toll agency, which charge the general public for their services. In addition, CapWIN's membership includes all 3 levels of U.S. government. It would be problematic for CapWIN to be a local, state, or federal organization, while preserving the political decision making responsibilities of the three levels of government. CapWIN has assumed the technical role of resolving the institutional and technical interoperability issues among public safety agencies. Therefore, CapWIN must be more than a regional planning organization.

* See: http://www.fhwa.dot.gov/pressroom/fhwa0124.htm, FHWA 24-01, June 26, 2001.

† Delaware; Idaho; National Capital Region, including D.C. and parts of VA and MD; Greater Yellowstone in WY/MT/ID; South Tahoe CA; Portland OR; Grand Forks ND; Port of New York/New Jersey; Houston TX.

It must also be organization that can deploy resources to meet the institutional and technical challenges associated with promoting regional public safety cooperation and communication [Maggio and Stough 2002].

An interstate compact among the District of Columbia, Maryland, and Virginia emerged as a viable organizational structure, meeting all of the CapWIN requirements for institutional stability, regional cooperation, funding potential, and technical integrity [Maggio and Stough 2002]. Maggio and Stough further recommended that Congressional approval, though not necessary, be sought for the CapWIN interstate compact. This, it was argued, would strengthen the agreement and provide for an appropriate federal role. The interstate compact is a form of hybrid organization that occupies a unique position in the U.S. federal system. Such organizations indicate agreement among sovereigns (the States) and at the same time, the Constitution requires federal government approval when compacts operate in areas affecting the national interest[*] and especially when the service or geographical areas of concern are multi-state in nature and create or respond to benefit or cost spillovers across state borders. The CapWIN interstate compact and its by-laws were agreed upon by the CapWIN Executive Leadership Group (ELG) and are in the process of being signed by the District and the States of Maryland and Virginia. In the interstate compact agreement, four members are to be assigned to each State[†]. Among the four members, one would be appointed directly by the mayor and the governors and would have veto power, representing primarily the State interests. The rest of the members of each State would then be selected by its local government entities and organizations, representing primarily the interests of local participants. Four members would be assigned to the federal agencies. Among them, two would be selected from the U.S. Department of Justice, the U.S. Department of Transportation, and the U.S. Department of Homeland Security. The other two would be selected from federal governmental entities that are organizational participants in CapWIN and eligible for connection to the CapWIN system, e.g., Federal Bureau of Investigation, National Security Agency, U.S. Park Police, or U.S. Capitol Police. In addition, one member would represent multi-jurisdictional governmental or quasi-governmental entities in the Virginia, Maryland and the District of Columbia, such as the Washington Metropolitan Area Transit Authority or the Metropolitan Washington Airports Authority (see Figure 20.3).

20.4 Two Interoperability Challenges

The U.S. National Capital Region and the United States face two major communication-related public safety and homeland security challenges: (1) public safety agencies have difficulty communicating with each other; and (2) they have difficulty communicating across political boundaries. These difficulties result from the lack of a uniform set of standards for communications equipment and the lack of a national organization whose purpose is to integrate and support the communications of different public safety organizations. These constraints limit the ability of public safety to respond to emergency situations. Unfortunately, these communication difficulties can result in a loss of life and property that otherwise would be preventable.

---

[*] *Brooklyn Bridge Park Coalition v. Port Authority of New York and New Jersey*, E.D.N.Y. 1997, 951 F. Supp. 383.

[†] The District of Columbia is treated as a State.

Participants	Representatives	Total Votes	Veto power
State of Maryland	1 State government commissioner	4	Yes
Maryland local agencies	3 Commissioners from local government user agencies		
Commonwealth of Virginia	1 State government commissioner	4	Yes
Virginia local agencies	3 Commissioners from local government user agencies		
District of Columbia	1 DC commissioner (mayor's office) 3 commissioners from DC local government user agencies	4	Yes
Federal government	1 Federal commissioner from USDOJ 1 Federal commissioner from USDOT 1 Federal commissioner from USDHS	2	No
	2 Federal commissioners from federal user agencieses	2	No
At-large participant	1 Regional authority commissioner	1	No
Total		**17**	

Figure 20.3 CapWIN Interstate Compact Commission membership and voting rights.

20.4.1 Institutional Interoperability Challenges

The U.S. National Capital Region consists of two states and a federal district and over 20 local jurisdictions not to mention a variety of authorities and special government organizations. The federal government, states, and local jurisdictions have different laws, regulations, and policy priorities for their public safety agencies. As a result, elected leaders and public safety officials have different objectives, constraints and are accountable to a different set of constituents. In addition, each public safety discipline and organization, as a result of its daily operations and technical and policy constraints, have established their own procedures for interacting and jointly operating with other public safety agencies. Until the establishment of the SAFECOM Program in the Department of Homeland Security in 2002, there had not been a national or federal organization whose purpose was to integrate the communications of all U.S. public safety organizations.*

Political culture is an additional factor that makes achieving public safety interoperability more challenging in the U.S. National Capital region. The Commonwealth of Virginia tends to be a conservative oriented state politically and thus favors limited government. Maryland tends to have a more liberal political culture and has a history of using its political authority for what is perceived to be in the best social interest of its citizens. The District of Columbia government shares it sovereignty with the U.S. Congress so it is constantly struggling to see that its interests are represented. Finally, the federal government has tended not to focus on local and regional matters

* SAFECOM's purpose is to help local, tribal, state, and federal public agencies improve their public safety efforts by improving the interoperability of wireless public safety communications systems. http://www.dhs.gov/dhspublic/interapp/editorial/editorial_0339.xml.

as these are outside its direct jurisdiction with few exceptions under the U.S. Constitution and Statutes. These constraints made it nearly impossible for any one political jurisdiction or public safety agency to take on the type of leadership role required to facilitate the institutional and technical coordination needed to improve public safety interoperability in the U.S. National Capital Region. This is a considerable challenge for the U.S. National Capital Region which has public safety agencies representing all levels of the U.S. government. This is also a considerable challenge for each agency to accomplish its organizational mission and provide more effective and efficient service to the public.

20.4.2 Technical Interoperability Challenges

In addition to institutional challenges, there are major technical challenges associated with making the public safety communications systems more interoperable. There is not a standard set of public safety communications equipment. Each public safety agency, subject to its budgetary constraints, purchases the communication equipment that best meets its operational requirements, and consequently, various 800 MHz and ACU 1000 radio systems have been deployed [National Institute of Justice 2003; see Table 20.1]. These systems allow limited voice communications between public safety workers who have different brands of communications equipment or operate on different radio frequencies. However, the performances of these systems tend to degrade as the number of users increases. These radio systems also do not allow public safety agencies with different communications systems to share data or access databases without the aid of dispatchers (see Figure 20.4).

First responders often do not have the ability to directly communicate with other public safety workers without the use of multiple dispatchers. Current and planned investments in incompatible technologies by local, state, and federal agencies continue to exacerbate the problem. The lack of coordinated guidelines and standards in public safety and transportation communication systems fosters discord and escalates the cost of providing service. Adding to the problem is the fact that public safety and transportation agencies cannot stop implementation of these systems in mid-deployment. Therefore, they continue spending funds for new technology and updating communications systems without focusing on resource sharing and interoperability opportunities. The cost of new technology can be expensive, but through partnerships and resource sharing, strategic planning, each agency can potentially save money.

In sum, interoperability among public safety agencies in the National Capital Region is hindered by both institutional and technical challenges. Each jurisdiction has its own capability and procedures for dealing with public safety incidents. However, the overall public safety of the U.S. National Capital region depends on the ability of all jurisdictions and public safety organizations to effectively communicate during minor and major incidents. The next part of this case study analysis discusses how CapWIN has attempted to address the institutional and technical factors that constrain interoperability in the National Capital Region.

20.5 Institutional and Technical Solutions

20.5.1 CapWIN and Institutional Interoperability Challenges

CapWIN has strived to address the institutional factors that have constrained the cooperation and communication of public safety agencies in the U.S. National Capital Region. While it remains a University of Maryland project, it has informally structured itself as a cooperative regional

Table 20.1 Pentagon Response Agencies and Their Radio Systems

Function	*Agency*	*Frequency Band (Megahertz, MHz)*
Fire	Arlington County, Virginia, Fire Department	800
	City of Alexandria, Virginia, Fire Department	800
	City of Fairfax, Virginia, Fire & Rescue Services	800
	City of Falls Church, Virginia, Volunteer Fire Dept.	800
	District of Columbia Fire and Emergency Medical Services Department	800
	Fairfax County, Virginia, Fire & Rescue Department	800
	Ft. Belvoir, Virginia, Fire Department	On Post 406–420 Mutual Aid 800
	Ft. Myer, Virginia, Fire Department (Provides service to the Pentagon)	On Post 406–420 Mutual Aid 800
	Loudoun County, Virginia, Fire & Rescue Services	30–50
	Montgomery County, Maryland, Fire & Rescue Services	138–174
	Prince George's County, Maryland, Fire Department	490–512
	Prince William County, Virginia, Fire & Rescue Services	138–174
Police	Arlington County, Virginia, Police Department	800
	Arlington County, Virginia, Sheriffs Department	800
	City of Alexandria, Virginia, Police Department	800
	City of Fairfax, Virginia, Police Department	800
	City of Falls Church, Virginia, Police Department	800
	Fairfax County, Virginia, Police Department	800
	Fairfax County, Virginia, Sheriff's Department	800
	George Mason University Police Department	800
	Greenbelt, Maryland, Police Department	450
	Loudoun County, Virginia, Sheriff's Office	30–50
	Virginia State Police	138–174
Federal Law Enforcement Agencies	Bureau of Alcohol Tobacco and Firearms	138–174
	Defense Protective Service	406–420
	Federal Bureau of Investigation	138–174
	United States Capitol Police	138–174

Table 20.1 (continued)

	United States Marshals Service	138–174
	United States Park Police	138–174
	United States Secret Service	138–174
	United States Park Police/Aviation Division	VHF/UHF
Other	Federal Emergency Management Agency (FEMA)	406–420
	FEMA Urban Search and Rescue Teams	406–420
	Metropolitan Washington Airports Authority Fire Department	800
	Virginia Department of Transportation	138–174

Source: Public Safety Wireless Network, *Answering the Call: Communications Lessons Learned from the Pentagon Attack*. Fairfax, VA: PSWN, 2001.

organization. It has an Executive Steering Group composed of CapWIN's government sponsors that provides project oversight. It has an Executive Leadership group consisting of representatives of elected officials and senior public safety officials from all three levels of government, which approves all major CapWIN policy decisions. CapWIN also has an Executive user group composed of public safety officials from all three levels of government, which provides technical oversight

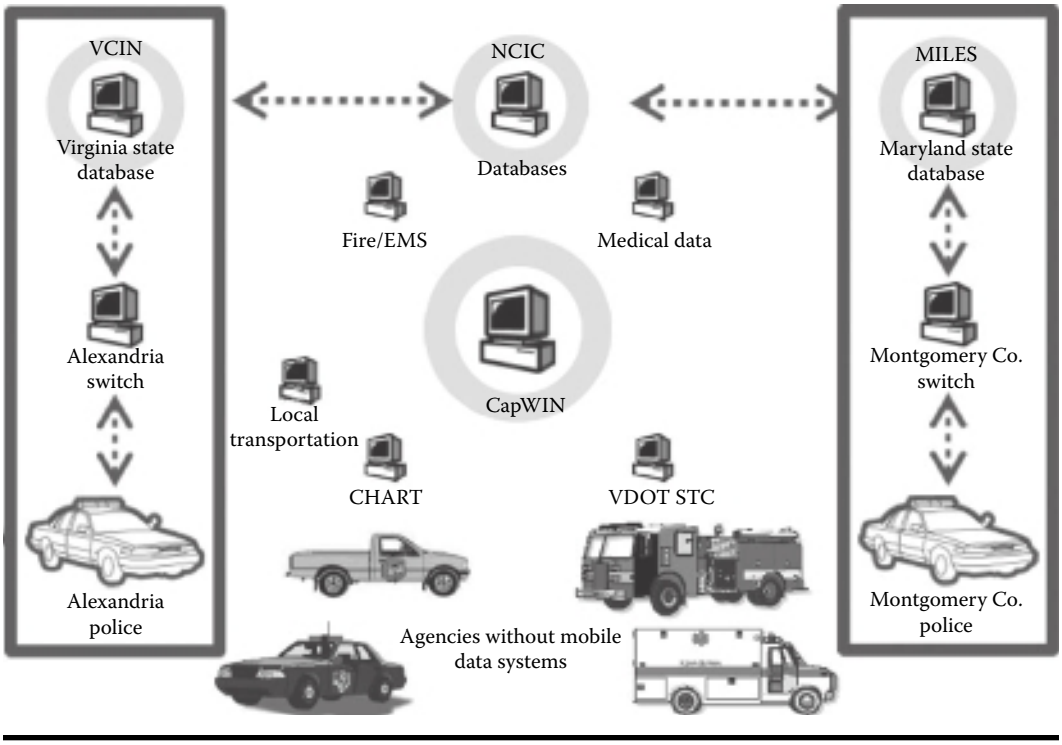


Figure 20.4 Fragmented and indirect communications systems in the region before CapWIN.

of CapWIN's engineering efforts. Furthermore, CapWIN has a Technical and an Operational group, both of which provide more detailed oversight of the technical and operational aspects of CapWIN. Finally, CapWIN has a small professional staff with experience in law enforcement, fire fighting, and emergency medical response. This staff works with contractors that are developing, updating, and maintaining the CapWIN software.

CapWIN has also demonstrated its strong leadership in meeting the institutional challenges of interagency and inter-jurisdictional public safety communications in order to effectively manage multiple governance structures of participant agencies and political jurisdictions. CapWIN, assisted by the School of Public Policy, George Mason University, reviewed alternative governance models, identified and evaluated potential governance solutions, and recommended the formation of an Interstate Compact as CapWIN's governance structure. The Interstate Compact structure is advantageous to preserve the voting rights (and majority rule) for all participating jurisdictions and agencies, to retain state prerogatives, and to ensure Federal participation without creating federal control. This recommendation is currently under consideration by the legislatures of the District of Columbia, Maryland, and Virginia.

CapWIN has shown an ability to motivate and inspire others toward achieving the goal of an integrated public safety communications network in the National Capital Region. Busy elected leaders and senior public officials from all levels of government have taken time to assist CapWIN's institutional and technical development. Public safety non-profit organizations have provided their professional insight to CapWIN. State universities in Maryland and Virginia have also provided CapWIN with technical and policy support. Several local jurisdictions and federal agencies have volunteered their personnel and operational assets for pilot evaluations and beta testing of the CapWIN system. Many public safety organizations have voluntarily sent their personnel to attend CapWIN training sessions. Finally, the Federal government and the States of Maryland and Virginia have provided financial support to CapWIN's operations.

20.5.2 CapWIN and Technical Interoperability Challenges

CapWIN, technically, is software and the supporting soft infrastructure that connects via wireless communication the jurisdictions and agencies in the National Capital Region regardless of their existing communications equipment and technical standards. In so doing, CapWIN provides first responders with an array of communication capabilities and direct access to a variety of databases. The communication capabilities accomplished through CapWIN include instant messaging, e-mail, and soon voice communications. Authorized CapWIN public safety users can access two national criminal justice databases, the National Crime Information Center (NCIC) and National Law Enforcement Telecommunications System (NLETS), and three state criminal justice ones, Maryland Interagency Law Enforcement System (MILES), Virginia Criminal Information Network (VCIN), Washington Area Law Enforcement System (WALES).* In addition, CapWIN also allows first responders to directly communicate with each other and to access specialized databases, such as HazMAT and ChemTrec (see Figure 20.5). As a result, CapWIN has provided public safety workers with the ability to communicate and share information in ways that were once technically infeasible.

CapWIN has assumed a regional and national leadership role in reducing the technical barriers that hinder public safety communications. It has developed an open architecture communications

* CapWIN fully meets and even exceeds the requirements of NCIC National Security Policy.

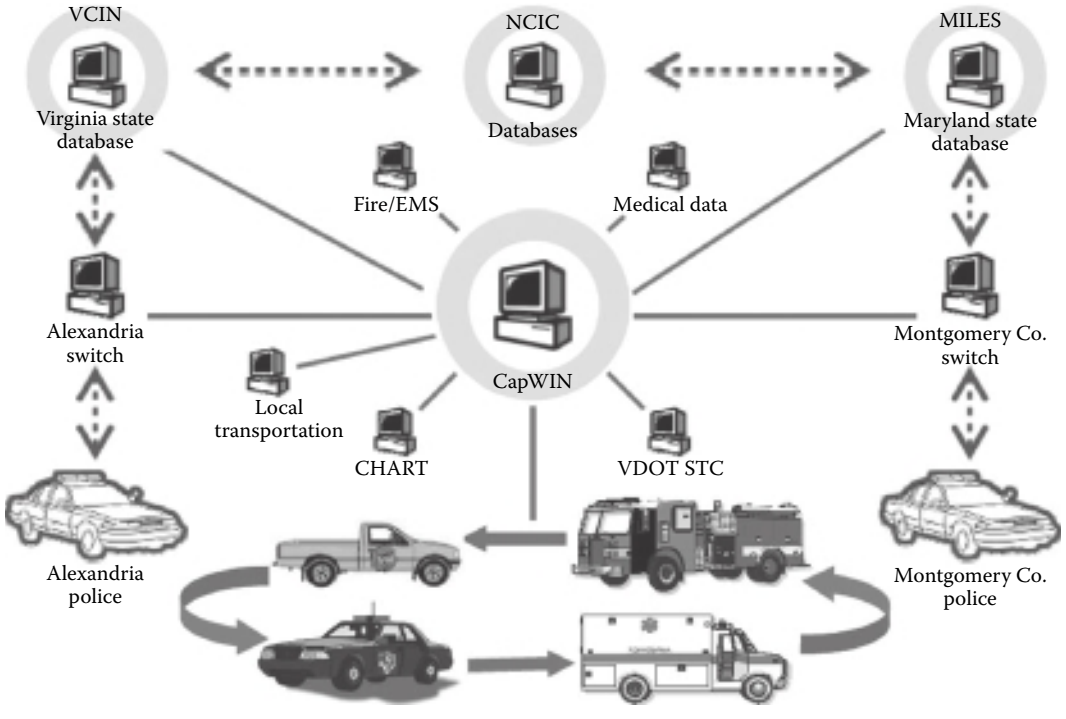


Figure 20.5 Interoperable and integrated communications systems in the region with CapWIN.

system that not only allows any public safety officers on patrol in the region to communicate with other public safety officers but also allows them to directly access multiple public safety databases. CapWIN's open architecture system minimized impacts on existing systems, allowing any interested agency or jurisdiction to participate in CapWIN without duplicating their purchasing efforts or abandoning their existing systems. It has identified and developed communications methods, based on evolving voice and data communications technology, that have provided public safety workers with low cost access to public safety information that was previously unavailable to them. It has also developed a network infrastructure that is expandable to serve more agencies in Virginia, Maryland, the District of Columbia, and other states. Finally, it has educated transportation, law enforcement, fire, emergency medical services, and legislative leaders on the importance of improving public safety communications.

20.5.3 CapWIN Functionality

CapWIN is a multi-state, multi-jurisdictional wireless public safety system. This partnership of communities and agencies serving Washington, DC, and Maryland, and Virginia parts of the region, is working to develop an Integrated Mobile Wireless Public Safety and Transportation Network that will enable public safety and transportation officials from over 40 local, State, and Federal agencies to communicate with one another in real time. CapWIN is and will increasingly provide firefighters, law enforcement, transportation officials, and other authorized emergency personnel with wireless access to multiple government databases during critical incidents, giving first responders and other public safety officials pertinent information to make critical decisions.

CapWIN is designed specifically for a mobile environment to provide public safety officers across jurisdictions and disciplines two critical capabilities: communications and information access. The communication subsystem provides a powerful directory of users as well as instant messaging, email, and incident management support functionality. The Information Access subsystem provides access to law enforcement data through Maryland Interagency Law Enforcement System (MILES); Virginia Criminal Information Network (VCIN); and Washington Area Law Enforcement System (WALES); and through those systems, National Crime Information Center (NCIC) and National Law Enforcement Telecommunications System (NLETS). These applications are currently available on mobile computers, hand-held devices, and desktop computers. CapWIN is also able to serve agencies either without or with mobile date computing capabilities. For agencies without mobile systems, CapWIN instantly provides them low-cost, reliable, and integrated wireless communication and information access. For agencies with mobile systems, CapWIN, instead of replacing their legacy systems, compliments and enhances the existing capabilities by providing a gateway to a wide range of public safety databases and by connecting an array of first responder agencies.

The existing CapWIN applications will continue to improve both in terms of enhancing existing core functionality and adding new functionality. New functions and enhancements to be added to the existing capabilities may include an interface to a Computer-Aided Dispatch/Records Management System (CAD/RMS) System, implementation of a voice-recognition interface, implementation and enhancement of a geographic information system (GIS) mapping capability, and interfaces to medical, hazardous materials, and additional transportation data sources. Future versions of the CapWIN System will also allow public safety officials to communicate directly with the Chemical Transportation Emergency Center (CHEMTREC) and access to the National Emergency Response Guide. This broad range of communications capabilities allows public safety officials to obtain information in a timely and efficient manner in order to better save lives and property.

20.5.4 Deployment Strategy

The CapWIN system was developed by the IBM Corporation under a contract to the University of Maryland on behalf of the participating CapWIN agencies. This contract included the up-front purchase of 10,000 concurrent end-user licenses. These licenses for the CapWIN software application, which includes both communications and information access capabilities, will be provided to participating agencies at no cost for use on their mobile or desktop computers.

The initial focus for CapWIN deployment is on the National Capital Region, including portions of Maryland, Virginia, and all of the District of Columbia. The target includes more than 100 fire, transportation, law enforcement, and emergency medical services throughout the Region. In October 2003, the first production-ready "Beta-Test" CapWIN application began implementation involving 20 participating agencies (see Figure 20.6). The test allowed for assessment of the application by support staff, and valuable feedback from emergency first-responder end-users provided for application improvements, modifications, and adjustments to enhance system technical performance. The Beta-Test concluded in late spring 2004 as the system moved into its first phase of limited production and general deployment.

In terms of geographic coverage, the goal of the CapWIN Program is to successfully implement an initial deployment in the National Capital Region and then gradually expand as interest and demand drives the need and additional resources become available. There has been interest

District of Columbia	Maryland	Virginia	Federal agencies	Other agencies
Washington Metropolitan Police	Prince George's Co. Police Department	Alexandria City Police Department	United States Park Police	International Association of Chiefs of Police
Washington Fire and EMS	Prince George's Co. Fire and EMS Department	Alexandria City Fire Department	United States Department of Justice/National Institute of Justice	International Association of Fire Chiefs
Emergency Management Agency	Montgomery Co. Department of Police	Arlington Co. Fire Department	United States Department of Transportation	National Institute for Missing Children
D.C. Public Works	Montgomery Co. Fire & Rescue Service	Arlington Co. Police Department	Public Safety Wireless Network	
Washington Metropolitan Transit Authority	Maryland State Police	Fairfax Co. Police Department	Federal Bureau of Investigation	
Metropolitan Washington Council of Governments	Maryland State Highway Administration	Fairfax Co. Fire and Rescue Service	United States Capitol Police	
	Maryland Emergency Management Agency	Virginia Department of Transportation		
	Maryland Institute for EMS Systems	Virginia State Police		
	Prince George's Co. Department of Public Works	Virginia Department of Emergency Management		
	Montgomery Co. Department of Public Works and Transportation	Virginia Emergency Medical Services		

Figure 20.6 Current CapWIN participants.

in expanding the CapWIN application and services to the Baltimore, Maryland, and Richmond, Virginia, metropolitan areas. CapWIN has developed a "phased-in" approach for expanding services and adding users that will include projections of anticipated system demands based on the number of users added during each phase of deployment. Data will be gathered to identify the number of potential system users as well as the anticipated level of system usage. This information is critical for determining staffing levels, allocating personnel within the CapWIN organization, and determining the proper utilization of resources for the most effective delivery of services to system users. Further, there has been Federal interest in seeing CapWIN replicated in other metropolitan areas across the United States and preliminary discussions for doing so have taken place.

20.6 Conclusion

In the National Capital Region, the lack of interoperability between various agencies and jurisdictions is a serious problem hindering the ability of first responders to effectively and efficiently save lives and property. The urgent need for improved interoperability has been further demonstrated by daily severe traffic congestion and a series of public safety events, including the Woodrow Wilson Bridge jumper incident, the ammunition truck overturn incident, the September 11th Pentagon attack, and the Washington Metropolitan area sniper incident. To satisfy the urgent public safety information-sharing and communications needs facing the U.S. National Capital Region, CapWIN has evolved from a "grassroots" concept and effort to an informal regional organization of federal, state, and local public safety agencies, and has

demonstrated that it can turn the goal of an integrated wireless public safety communications system into a reality.

CapWIN is a vision of a seamless public safety and emergency information network that would span the entire National Capital Region. The fundamental barriers to achieving interoperable public safety information sharing and communications are the lack of institutional and technical coordination between political jurisdictions and public safety agencies. These challenges are compounded in the National Capital region as it has a wide diversity of political jurisdictions and public safety agencies. CapWIN has demonstrated its strong leadership in meeting the institutional challenges of inter-agency and inter-jurisdictional public safety communications in order to effectively manage multiple governance structures of participant agencies and political jurisdictions. CapWIN has also assumed a regional and national leadership role in reducing the technical barriers that hinder public safety communications. It has developed an open architecture communications system that not only allows any public safety worker on patrol to communicate with other public safety workers, but also allows them to directly access multiple public safety databases. The case of CapWIN holds lessons for other regions, specifically for facilitating relations between the federal government and the states, and for improving public safety communications networks and policies.

References

Arlington County Virginia (2002). *Arlington County After-Action Report on the Response to the September 11 Terrorist Attack on the Pentagon*. Retrieved on April 18, 2003 from http://www.911investigations.net/document793.html

CapWIN (2001). *CapWIN Strategic Plan*. Retrieved on March 28, 2004 from http://www.capwin.org/documents.html.

Gluckman, S and J. Mechling (2003). *Capital Wireless Integrated Network (CapWIN): An integrated transportation and public safety information network*. E-Government Executive Education (3E) Project. John F. Kennedy School of Government, Harvard University.

Greater Washington Initiative (2003). *Greater Washington 2003 Regional Initiative*. Retrieved on April 18, 2003 from http://www.greaterwashington.org/forms/thanks.htm

International Association of Chiefs of Police (2000). *A Study of Best Practices in Information Integration Projects*. Retrieved on March 28, 2004 from http://www.capwin.org/extras/reports/Study_of_Best_Practices.pdf

Jones, K. (1999). *Recipe for Disaster*. Retrieved on April 18, 2004 from http://firechief.com/ar/firefighting_recipe_disaster/index.htm

Lund, D. (2002). *Learning to Talk: The Lessons of Non-Interoperability in Public Safety Communications Systems*. Retrieved on April 18, 2004 from http://www.justiceworks.unh.edu/justiceworkspub.pdf

Maggio, M.E. and Stough, R. R. (2002). *CapWIN Governance Options*. Report provided to CapWIN Ad-Hoc Executive Committee and the Department of Transportation, School of Public Policy, George Mason University.

National Institute of Justice (2003). *When They Can't Talk, Lives Are Lost: What Public Officials Need to Know About Interoperability*. Retrieved on April 18, 2004 from http://www.agileprogram.org/ntfi/ntfi_brochure.pdf

Potomac Conference (2001). *2001 Potomac Index Measuring Progress in the Greater Washington Region*. Washington, DC: Potomac Conference.

Public Safety Wireless Network (2001). *Answering the Call: Communications Lessons Learned from the Pentagon Attack*. Fairfax, VA: PSWN.

Reid, A and P. Davis (1998). Jumper on bridge causes gridlock. *Washington Post*, November 5, 1998. Retrieved on April 18, 2004 from http://www.washingtonpost.com/wpsrv/local/longterm/wilson/wilson110598.htm

Schrank, D and T. Lomax (2003). *The 2003 Annual Urban Mobility Report*. College Station, Texas: Texas Transportation Institute.

University of Virginia (2000). *Best Practices White Paper: Transportation Management and Public Safety*. Retrieved on April 18, 2004 from World Wide Web: http://www.capwin.org/extras/reports/Best_Practices.pdf

U.S. Department of Transportation, Federal highway administration, U.S. department of transportation (2001) *Designates Nine ITS Projects for National Evaluation*. Retrieved on April 18, 2004 from World Wide Web:http://www.fhwa.dot.gov/pressroom/fhwa0124.htm

ORGANIZATIONAL RESEARCH

V

Chapter 21

Implementing Virtual Collaboration at the Environmental Protection Agency

Julianne Mahler and Priscilla M. Regan

CONTENTS

21.1 Introduction

Over the past decade, we have seen an upsurge of computer-mediated tools for communication, collaboration, and information sharing in organizations in every sector. Intranets, now a feature of virtually all large organizations, make it possible to disseminate an array of important

information such as agency news, services, libraries of procedures and regulations, and widely used data sets. E-mail and common word processing platforms make it possible to communicate and share documents asynchronously, an asset in large multidivisional and geographically dispersed organizations. More recently, other communication platforms such as Instant Messaging (IM) and chatrooms have appeared in organizations to foster often informal information sharing and communication. Monitored and unmonitored chatrooms, for example, offer a site for organization members to share ideas, register complaints, and solve problems, and their advent was greeted with expectations about their use in the public sector [Mahler and Regan 2002]. Blogging, a more recent Internet feature, may be supported by intranet platforms or practiced more informally as a way to discuss obstacles, explore problem interpretations, and generate virtual "Communities of Practice" [Snyder, Wenger, and Briggs 2003-4; Mahler and Regan 2009]. Joint-authoring technologies such as wikis may be supported to encourage collaborative work, especially in organizations devoted to knowledge work [McAfee 2006]. These tools, too, show great promise for allowing members of widely distributed organizations to work together on documents and projects.

In this chapter, we examine the adoption and implementation of some of these computer-mediated tools for communication, collaboration, and information sharing in one federal agency. We explore the use of targeted, personalized virtual networking channels, such as e-mail and instant messaging, and the implementation of organization-wide platforms such as intranets and portals along with newer platforms for blogs and wikis, seen as especially useful for managing collaborative work and enhancing the capacity of members for self-organizing. However, our prior research [Mahler and Regan 2002] suggests that even well-designed new technologies may not be well received or readily used by agency staff. By comparing results of interviews in 2002 and 2007 at the U.S. Environmental Protection Agency (EPA) and examining 2008 reports on Web 2.0 technologies by that agency, we begin to identify factors that thwart and advance the adoption and use of these technologies. We find that, as with earlier technological innovations, top-down implementation proves less successful than allowing smaller units some room for experimentation both in terms of specific technologies and in terms of incorporating applications into work processes.

We have selected the EPA for this in-depth examination for several reasons. The EPA has been on the forefront of the design and introduction of collaborative information-sharing technologies and offers a rich case study of the implementation of these new technologies. It is a large, multi-divisional and dispersed governmental organization where face-to-face communication is difficult and costly, especially among regional offices. In addition, because the agency was created from separate elements of other agencies, it has retained distinctive divisions and has often been characterized as "stovepiped." The effort to overcome these divisions led to earlier experiments in creating an agency-wide intranet and the more recent adoption of broadly accessible collaboration and data-sharing platforms.

21.2 Advantages of Computer Mediated Communication and Information Sharing

Computer-mediated communication and information sharing tools encourage and capitalize on the creation of useful lateral linkages, particularly in complex agency settings such as EPA. Recent studies and reports of government agency efforts suggest that the creation

of virtual organizational networks provides "opportunities to collect and efficiently analyze unprecedented volumes of information, gain enhanced buy-in for organizational goals and policies, and engage new audiences to produce original solutions to complex problems" [DiGiannarino and Trudeau 2008, p. 9]. Well-designed and easily navigated virtual networks allow like-minded members engaged with similar problems to find each other and work together. These networks offer a way to overcome the geographic and disciplinary fragmentation and lack of cohesion characteristic of some of large, multi-divisional governmental organizations.

There are a wide range of computer-mediated tools to accomplish these objectives. McAfee [2006] considers the tools that members can use to share not just data, but to create and share their work collaboratively on projects. He argues that Web 2.0 technologies such as blogs, and joint authoring tools, such as wikis, offer major advantages over e-mail and intranets for meeting the demands of collaborative knowledge work. He distinguishes between two types of information-sharing technologies: channels and platforms, each of which has some advantages and some drawbacks. Channels, like e-mail and IM, offer a place to write and share ideas but are not accessible to all who potentially may be engaged in the issues in other parts of the organization or outside the agency. In addition, many in information intensive organizations feel overwhelmed by the volume of e-mail traffic. Platforms, such as intranets or portals, allow organization members or publics to access existing information in a static environment. But while intranets, Internets, and information portals offer information to all who may be interested, they do not provide real-time updates and do not allow creative personalized messages.

The capacity to author proposals and to observe the exchange of ideas online is a significant advance offered by newer platforms that support interactive technologies such as blogs, virtual meetings, joint authoring tools, podcasts, social networking sites, or syndicated Web feeds. Blogs are online conversations in which the posted comments are cumulative and can be observed by all who enter the site, which may be open to the public or restricted to organization members. On wikis, authors can work jointly on a document and can revise each other's work. Meetings tools similarly can be established to allow a defined group to work together, converse, and exchange comments or drafts in real time online. Tagging entries and sites makes it possible for content experts to establish categorization systems and taxonomies, which enable users to initiate more effective searches. In some systems these categorizations are created from the bottom up by users, generating a folksonomy, "a categorization system developed over time by folks" [McAfee 2006, p. 25]. McAffe argues, "When authoring tools are deployed and used within a company, the intranet platform shifts from being the creation of a few to being the constantly updated, interlinked work of many. Evidence from Wikipedia shows that group authorship can lead to convergent, high-quality content" [2006, p. 24].

Government agencies are adopting these innovations in increasing numbers. The Collaboration Project supported by the National Academy of Public Administration is working to advance Web 2.0 applications in government. The Project offers an "independent leadership forum to jump start the cause of collaborative technology to drive innovation and change in Government" [DiGiannarino and Trudeau 2008, p. 7]. The Project holds forums in which agency information officers and staff from a wide range of federal agencies meet to exchange best practices and brainstorm (http://www.CollaborationProject.org). There is a fast growing body of experience with these technologies in the public sector. Many federal agencies have established official blogs to communicate with the public (see the U.S. Government Web site: http://www.usa.gov:80/Topics/Reference_Shelf/News/blog.shtml). Public education and policy feedback are some of the reasons most often cited for initiating the blogs [Mahler and Regan 2009]. Within agencies,

virtual information networks are being constructed to allow information sharing across subdivision boundaries. The "Intellipedia" wiki site of the Office of the Director of National Intelligence has made it possible for the agents from many intelligence organizations to input and share data securely [DiGiannarino and Trudeau 2008, p. 6]. In Chicago, blogs have been used to communicate directly with citizens complaining about transit cutbacks, and wikis have found a place in communicating with citizens for disaster response. In both cases, communication with citizens was direct without the intervention of the press or government Webmasters (except for moderators). These networking sites offer advantages over e-mail efforts as well. "E-mails have to be sent, forwarded and continually passed along to the right people, and e-mail addresses have to be known. Wikis, on the other hand, mobilize and bring together a 'mini-governance structure' so people can reach agreement and work together" [Perlman 2006].

These developments suggest that Web 2.0 technologies are capable of making valuable contributions to the ever-present coordination and collaboration requirements of public organizations. But how are these new systems being accepted within agencies, and how are these tools building on already established platform and channel technologies such as intranets and e-mail systems? We know from our earlier research [Mahler and Regan 2002] that many agency members may be reluctant to use new virtual collaboration technologies because of what they perceive as steep learning curves or a lack of fit between what they believe the tools offer and what they need for their work. Elaborate "dog and pony shows," launched to generate interest and understanding of the new systems, accompanied the more successful efforts.

Others have also found impediments to implementation. Dawes and Prefontain [2003] conducted research on collaborative projects supported by advanced information technology (IT) including geographic information data-sharing, e-filing for taxes, and public-private partnerships to launch jobs portals. They found that successful collaborative projects were characterized by trial-and-error experimentation, feedback, and learning. The results of these interactions were seen to directly affect the levels of trust and the level of success in the projects. Pardo, Gil-Garcia, and Burke's research also underscores the importance of trust [2006]. But behind these organizational processes, the availability, adaptability, and affordability of information technology resources and choices had consistently important effects on the participants and the results.

Fedorowicz, Gogan, and Williams [2006] also offer lessons from research on a set of e-government collaborations that identify some of the impediments created by incompatible information systems and mixed motives for cooperation. The issues that were overcome to achieve collaboration are instructive for large, complex organizations such as the EPA. Problems of resource competition, unified leadership, motivation, and legacy systems were encountered and usually overcome in these successful cases. They report that gaining a critical mass of supporters and participants was a lengthy process requiring political skill and negotiation to overcome the constraints and differing priorities of participants. Accomplishing these things in large, multi-organizational networks required not just one, but many effective "Champions" (p. 23). Also administrative challenges included accommodating differences in readiness of participants to make the changes needed to achieve collaborative work or information sharing and recognizing the need to make the project effort attractive to participants so that the value of collaboration for the organization is seen to exceed costs. Finally, technical factors affected the success of the collaborations. Fedorowicz, Gogan, and Williams found that in such information-based collaborations, agreements to permit the originators of information to share their data rather than cede possession to a central authority avoided problems of ownership and control as well as increased the accuracy and timeliness of the data. Legacy data systems and incompatible formats limited the effectiveness of collaboration efforts, and efforts to create new data standards were effective when organizations were allowed full participation.

Our prior research on the EPA is expanded here to understand how more advanced versions of earlier online collaborative tools and the newer Web 2.0 platforms are being developed and introduced. Are the promotional efforts that achieved some success with the earlier technologies being put to use with the newer tools? And with what results? The EPA is a founding member of the Collaboration Project [DiGiannarino and Trudeau 2008, p. 8] and thus an especially good site for a study of how the new technologies are being introduced and the difficulties of gaining member support and use.

21.3 Methods

For purposes of this chapter, we draw on our prior work, conducted during 2001–2002 [Mahler and Regan 2002 and 2003], and more recent interviews in 2007 [Mahler and Regan 2007] to investigate the evolution of computer-mediated tools in EPA. This work allows us to compare EPA activities in these two time periods, focusing on which technologies are being used, for what purposes, with what success, and also on the factors that have shaped the implementation of these technologies. In effect, this gives us a longitudinal case study of EPA.

During both time periods, our research proceeded in three steps. First, we began with an examination of pages on the EPA's Intranet and Internet Web sites to ascertain what e-government activities were currently occurring with the agency, what electronic information sharing activities could be gleaned from a review of available online activities, and who appeared to be the key people involved in these activities. We began our searches with the chief information office in each agency but in both cases quickly branched out into other areas of the agency. Next we searched Government Accountability Office (GAO) reports to identify online collaborative activities that the GAO had mentioned in its review of the EPA's activities. Finally, we conducted more than 15 face-to-face detailed interviews with EPA personnel involved in the development, support, and use of online collaborative tools. These included middle managers at the division level and program managers. Our interviewees were in IT positions, in general management, in public affairs, and in programs. At the end of each interview, we asked whom else in the agency we should interview.

In our first set of interviews [2002], the focus was very much on the development and use of the EPA Intranet, which was widely viewed in the agency as the platform for future online collaborative work based on shared data and access to moderated and unmoderated chatrooms. In the second set of interviews [2007], we posed questions about: current use of computer mediated communication and information-sharing technologies; examples of centralized, data-sharing platforms; forms of decentralized, informal, and lateral communication and joint-authoring tools; use levels and patterns for each; and evidence that these technologies are contributing in concrete ways to efforts to coordinate and integrate work in large, multi-divisional governmental organizations. In both sets of interviews, the factors advancing or limiting the implementation of the technology were major areas of discussion.

21.4 Results

The results from our comparison of managers' views on these technologies over time are sobering and indicate the incremental character of technology adoption and use. On the other hand, we do see a steady trajectory of applications as members become more comfortable with technologies. This suggests, however, a considerable lag between the introduction of a new tool and widespread

acceptance. Perhaps our most interesting finding, however, relates to the ways in which the newest tools are being designed and introduced.

21.4.1 The Pattern in 2002

In 2002, the prime emphasis on the use of communication and data-sharing technologies within the EPA was on the agency's new Intranet, a platform technology, and the collaborative tools it supported. The idea behind the Intranet, called EPA@Work, was to put information that is important to EPA employees at their fingertips: "multiple sources of information to help EPA employees effectively do their jobs are just a click away" [Mahler and Regan 2002]. The first EPA Intranet resulted from a realization that other agencies were beginning to use Intranets and that there would be value from an EPA-wide Intranet available across the relatively stovepiped divisions of the agency. A team of three, operating from the Office of Information Resources and Management but with support from the top of the agency, developed the prototypes of the Intranet and its initial agency-wide deployment in January 1998. The members of the team all had some computer and technical background but were basically interested in information applications. In developing applications, team members interviewed managers of various programs to identify areas where the Intranet might offer new opportunities. The Intranet did not have a separate budget; instead funding came from the Internet budget.

At that time about 70% of the EPA@Work was designed to enhance access to facilities including activities such as cleaning, copying, and parking. One function that employees consistently found valuable, and that was regularly used, was the "EPA locator" by which staff could find contact information for other employees and contractors. This function was prominent on all iterations of EPA@Work. Another function that was popular involved forms and information on travel. Forms could be downloaded and printed but could not yet be completed and submitted online.

The 2002 EPA Intranet also offered the capability of creating online work groups, chat rooms, and collaboration through its license for Lotus Notes and Lotus Notes Mail. It was hoped that these technologies would spur real cooperative projects and problem solving. Members might join a chatroom to comment or even just to complain, but over time, solutions and projects might emerge. However, these more interactive functions were not yet being used widely in the agency because of training requirements, firewalls, and expense. We found that the EPA used formal group collaboration software that required some training, and although this seems like a small impediment, participants seemed to be reluctant to confront this hurdle to explore what was only a potentially useful collaborative opportunity. We found that staff were disinclined to use even labor-saving work applications if the software was unfamiliar and required an investment in training [Mahler and Regan 2002]. The Intranet team had demonstrated the People Soft Portal, which they hoped would allow customization and more collaboration and flexibility. There was an expectation that this might constitute the next iteration of EPA@Work.

Several factors help account for the mixed record of success from these implementation efforts. First, managers saw the early successful developments of the agency's Intranet as the result of its having been led by administrative staff and program managers rather than by technical staff. This ensured that decisions were made based on what employees were likely to want and use and what functions were important to the agency as a whole. The Intranet team reasoned that if decisions are driven by what is technically possible or innovative, employees will need to readjust their work habits to suit the new technology. To be useful to the agency and staff, our EPA informants indicated, the Intranet technology should accommodate the needs and conventions of the employees

and organization. Moreover, if management and staff needs drive development, new technical features may be created. Managers can challenge technical people to find appropriate solutions that may not be part of standard technologies.

Second, we found that marketing of the Intranet to employees was critical throughout all the early stages of development and deployment. At various points, "Intranet Weeks" were held when the Intranet team held a "dog and pony" show to illustrate the benefits and capabilities of the Intranet. Although attendance tended to be low at such events, the Intranet team thought that these were important for publicizing the Intranet.

However, other factors acted to constrain the success of these efforts. Resources for this kind of development were very limited. The EPA Intranet team believed that it was important to expand the Intranet as the technology and resources became available to do more on it. Money was a limitation and affected what the team was able to develop; for example, portal technologies were too expensive at that time. The team tended to improvise where needed, developing its own software so that it was not restricted to what was available "off the shelf." Likewise, we found a mixed record of upper management support for and interest in the agency's Intranet. We found that management, though supportive in principle, was slow to actively encourage employees to use the Intranet. Perhaps most importantly to its overall success, management did not act to limit the availability of information to the agency-wide Intranet only. The EPA agency-wide Intranet co-existed with other, earlier Intranets at the division, program, and regional or field office level. Smaller-scale online collaborative innovations could and did emerge at those levels earlier than at the agency wide level. In 2002, it appeared that most of the online work within the EPA occurred in such smaller units, and those Intranets were more valuable to staff on a day-to-day basis. We found that even three years after the creation of the agency-wide Intranet, many employees were still not aware that there was an EPA headquarters Intranet.

Trust and the learning curve for the interactive online tools were also important to early adoption. Resistance to the use of collaborative functions appeared to be based on the unwillingness of staff to undertake the training needed to use these relatively cumbersome online tools, but there were also concerns about privacy and the possibility of reprisals for unauthorized content.

21.4.2 Five Years Later

By 2007, we see a number of advances in virtual collaboration tools, including elements of Web 2.0. Although much was hoped for from EPA-wide Intranet when it was launched, in general

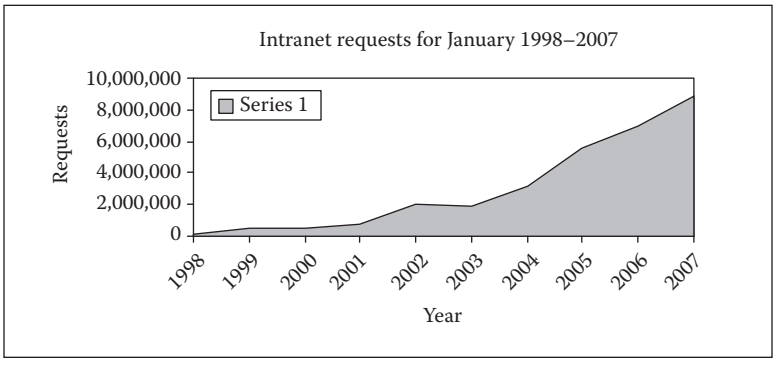


Figure 21.1 EPA Intranet requests.

administrators have been somewhat disappointed in the response. One of our interviewees said that the Intranet site had become "static" and costly. It should be noted, however, that despite the concerns of designers, the number of requests and the number of sites linked through the Intranet have risen rapidly since 2002 (see Figure 21.1). Employees appeared to be using the agency-wide Intranet for their employee administrative functions, such as travel and pay, rather than for collaboration.

The Intranet site provided access to Lotus Notes and Quick Place, a meeting tool that could be used for real-time collaboration. Like Lotus Notes, however, employees found Quick-Place to be overly complex and not user friendly, and consequently it was not much used. Instead, a popular interactive technology with capacity for joint authoring was the commercial application, "Go-to-Meeting.com." This application was not supported by the agency Intranet, but several of the offices we visited were subscribing to the user-friendly technology. It reportedly did not require nearly as much training as the agency-supported virtual meeting application. One user reported keeping the application open all day to carry on complex conversations with colleagues near and far and to share files for discussion.

21.4.2.1 Data-Sharing Platforms

By 2007, several platforms for data sharing and the dissemination of agency information were in various stages of development, use, or decline. Top-level support continued for experimentation. Directly or indirectly, however, these tools also provided opportunities and resources for collaboration among working groups. One iteration of an online collaboration space was part of an effort to design a shared or common environmental data repository termed "Enterprise Portal." One example of the potential of the system was a space that was used by the Office of Air and Radiation and the Research Office to provide for easier collaboration on the permit process. In designing this space, users were asked about what data sets they looked at every day and designers then tried to populate the portal with the information that was used most frequently. This space was championed by a former Chief Information Officer who had seen the need for such an online space, but in practice, its creators were less clear about specifically how to make it valuable to potential users. As a result, anything that could conceivably be beneficial was put up on the Enterprise Portal, rendering it less functional than what might have been the case if it had been more targeted. In addition, because of system architecture, it required high levels of expertise to add or update the online information, adding to the expense and difficulty of maintaining the site. Access to data also became a problem as there was no single sign-on procedure and different security protocols complicated collaboration. Finally, the idea behind the Enterprise Portal was primarily to make the individual's job easier rather than to facilitate real collaborative work. As a result, the Enterprise Portal turned into a static tool rather than a broadly collaborative space.

A second generation platform for data sharing and collaboration from which much was expected was the Environmental Science Connector. The project is a product of Office of Environmental Information, a liaison office established to foster collaboration across the agency and to help resolve issues of data ownership and responsibility for the approval of data use. This platform was designed to overcome long-embedded incompatibilities in the data of some of the divisions within the agency to create a platform that features "deep integration" of data along with several collaborative tools. When complete, the system should allow search for data on toxic substances across media such as air, water, or food. The new data-sharing function was the result of a great deal of investigation by Office of Environmental Information to determine needs and uses of data across the offices of the agency that had traditionally been characterized as fragmented.

The Environmental Science Connector has a universal tool bar with links to instant messaging, instant meeting, Lotus Notes, blogs, and wikis. This was envisioned as a shared "workbench," where people could work on documents, discuss priorities, solve problems, and designate who would do what next. The Connector also offers an "instant meetings" function, which allows agency staff to go immediately to a shared space for a meeting; this was generally done so that they could look at a document simultaneously and even share control of the cursor. The Connector has some advantages over the Enterprise Portal. First, the Connector has a more defined audience, and so designers had a better idea of what kinds of information would be useful. For example, it provides information for the Office of Research and Development, with about 3,000 members, and its Environmental Information Management System, which posts research updates in specific areas with links to the public-access Internet. At the time of our interviews, there were six to eight scientist groups reporting peer reviews on the Connector. Thus, it can be customized to provide access to shared documents for a specific community of practitioners, such as the Geospatial team. In addition, the administrative processes were standardized for the groups using the Connector, and it used a single budget system, making it easier to fund and manage.

The manager of this project made a low-key launch of the new platform, demonstrating it to user groups at Headquarters and in the regional offices. As of February 2007, this was still in the pilot stage, with the formal launch spring, in 2007. Different work groups were being invited to sign on to try out the space. Site designers were evaluating how people used that site and what was needed to store and share documents on which staff were collaborating.

21.4.2.2 Web 2.0 Applications

According to our 2007 interviews, the record for the adoption of Web 2.0 tools was mixed. Our headquarters informants said they had not seen the use of blogs. They believed that staff would be hesitant to use them, and they themselves were not convinced that the technology would actually be useful for collaboration. They thought blogs would more likely be used for comments by individuals on issues of common concern rather than for collaborative work. Another respondent characterized blogs as "open journals." Similarly, they were not aware of the use of chatrooms for collaboration but thought they were being used instead for answering direct questions. Most did, however, believe that in a decentralized agency such as the EPA, there were likely to be wiki applications. They could see value in them as a tool for online collaboration, although they did not believe that their use had been fully explored yet within the agency.

In our visits to the EPA, however, we did indeed see evidence that wikis were being used by some workgroups, especially among those working on data-sharing applications. One EPA staff member, a sophisticated user of online applications, characterized wikis as a searchable repository of comments, drafts, and papers, like a "communal closet." There was an Oracle wiki program that was available from the EPA Intranet; but it was not simple to either use or to install. It appeared that some were using other easier and more flexible wiki-type applications that were not supported by the agency so-called "rogue sites."

Since our 2007 interviews, other developments of these technologies have emerged. The Web 2.0 Workgroup, a volunteer subgroup of EPA's Web Workgroup had, according to its 2008 White Paper, grown to over 40 members. The group offered an "overview and cases for the use of the following Web 2.0 technologies: blogs, wikis, video-sharing, photo-sharing, audio and podcasting, virtual worlds, social networking sites, syndicated Web feeds, mashups, widgets, webinar/webcasts, and social news sites. In addition to an explanation of how each technology could be

applied in the context of work at EPA, each section presents obstacles, recommendations, and, wherever possible, federal examples" [EPA Web 2.0 Workgroup 2008, p. v].

The group's purpose has been to educate members about the potential uses of the Web 2.0 technologies for EPA's work, in part, by showing examples of the use of the tools in other agencies such as National Oceanic and Atmospheric Administration (NOAA) and National Air and Space Administration (NASA). They also hoped to open a discussion about the barriers to the implementation of the technologies, such as agency Web content approval requirements, issues with the Freedom of Information Act (FOIA), and policy issues with posting information and comments on blogs or social networking sites. They noted, "While EPA's priority will always be on the delivery of high quality, accurate and authoritative information from its own sites, content stewards should be aware that non-EPA, socially-created sites may play a prominent role in how the public obtains information about EPA's policies and programs. And as we move forward, we must begin to consider where and how we can contribute information to third party sites" [p. 33].

A number of factors seem important in accounting for the implementation of these applications based on our findings in 2007 and the start of 2008. First, small-scale experimentation was important for innovation. For example, the wiki program that was available on the agency-wide Intranet was neither easy to use nor simple to install, so some employees were experimenting with other applications. Our interviewees underscored the importance of such "rogue sites" in allowing for experimentation with different programs and groups of people. These trial applications were revealing valuable insights into the optimal size for a wiki, the best way to organize the material on wikis, and the best way to manage the evolution of a wiki. But because the agency supported applications were seen as cumbersome, informal personal trials with alternative kinds of software were emerging quietly and informally.

Second, during this time period, what support we found for blogs and wikis seemed to be coming from mid-level managers in the Office of Environmental Information and volunteers to the Web 2.0 Workgroup. But we did not hear reports of strong upper-level institutional support for these kinds of tools. Managers at the EPA are rather trying to consolidate progress with the existing portal project and the new Environmental Science Connector.

Third, collaboration was not easily gained regardless of the ease of communicating complex information. "We are lowering the barriers to good communication, but that does not mean good communication will result," noted one manager. The issue appeared less to be one of concern for official disapproval than the learning curve for the new applications and inertia about using new technologies, and the importance of establishing trust among members of the collaborative group. One manager who had been using joint authoring tools like wikis with a work group reported that few in the agency were actively interested in these tools. His efforts to model their use with subordinates had only mixed results.

21.5 Discussion and Conclusion

Developments in 2007 and 2008 suggested an interesting pattern of implementation of these virtual collaboration technologies, especially in light of the agency's earlier experiences. First, the more exciting and advanced cases of adoption of virtual collaboration technologies, especially the Web 2.0 tools, that we identified were occurring in relatively small groups that initiated the online activities on their own in order to more efficiently and effectively conduct their work. These were very much bottom-up activities that were begun at the initiation of one or two individuals

who were technologically savvy and very comfortable in the online environment. Much of the real innovation in computer mediated communication and collaboration appears to begin very informally with individuals who are at ease with the technologies and take the lead in initiating similar uses in the workplace.

The approach of smaller groups initiating change is in some sense a departure from the agency's approach to the innovation of the agency-wide Intranet. The large, organization-wide publicity and educational approaches to gaining users in the early time frame has given way to a mix of formal and informal methods, with person to person buy-in through the all-volunteer and ever-expanding Web2.0 Workgroup [EPA Web 2.0 Workgroup 2008, p. ii]. Room for experimentation appears to be important for the development of informal collaboration technologies, but this may be a product less of a purposeful policy than of "benign neglect." Regardless of its roots, the value of such flexibility permits the trial-and-error process, identified by Federowicz, Gogan, and Williams [2006] and Dawes and Prefontain [2003], to occur, allowing participants time to work through their different priorities and through any technical challenges.

In addition, much of the collaboration at this point was occurring within technical teams and offices rather than across divisions or agency-wide. And it may well be the case that online collaboration occurs more easily in such a small unit because the necessary trust, common leadership, shared expertise and intellectual concerns, important factors noted earlier in our research and by Pardo, Gil-Garcia, and Burke [2006], are most often found there. This pattern has great value if sub-units of a large department are relatively autonomous in their work, but it is a less favorable, at least in the short term, for achieving collaboration across multi-divisional organizations or across organizational boundaries. This parallels the earlier Intranet experience within EPA in that division Intranets were actively used by employees while they were reluctant to embrace the new agency-wide one. And it also underscores the point that technology does not provide "fixes" to organizational problems or dysfunctions unless technological innovations are accompanied by other organizational changes as well.

Finally, we found that the support of top management was necessary for the design and successful implementation of the Intranet-based data-sharing platforms, such as the Enterprise Portal and Environmental Science Connector. However this high-level support is not only unnecessary, but may even be counterproductive for the implementation of Web 2.0 technologies. At this stage a more open implementation pattern that encourages exploration of the potential uses of these new technologies, for example virtual worlds and social networks, seems more appropriate and more likely to be successful. In the EPA case, these groups are composed of volunteers who share an interest in and facility with the technologies. This pattern offers lessons for future implementation efforts with Web. 2.0 tools.

References

DiGiannarino, Frank and Lena Trudeau. 2008. Virtual networks: An opportunity for government. *Public Manager* 37, 1 (Spring):5–11.

Dawes, Sharon and Lise Prefontaine. 2003. Understanding new models of collaboration for delivering governmental services. *Communications of the ACH* 46, 1 (January):40–42.

EPA Web 2.0 Workgroup. 2008. Environmental protection agency web 2.0 whitepaper. U.S. Environmental Protection Agency. http://intranet.epa.gov/webgroup/meetings/02-08/presentations/web20/web20whitepaper.pdf (accessed January 29, 2009).

Fedorowicz, Jane, Janis Gogan, and Christine Williams. 2006. *The E-Government Collaboration Challenge: Lessons from Five Case Studies*. Washington, DC: IBM Center for the Business of Government.

Mahler, Julianne, and Priscilla M. Regan. 2002. *Federal Intranet Work Sites: An Interim Assessment*. PricewaterhouseCoopers Endowment for The Business of Government, Arlington, VA: E-Government Series.

Mahler, Julianne, and Priscilla Regan. 2003. Federal agency intranets: worksites for management problem solving and collaboration. In *Managing IT in Government, Business & Communities*, ed. Gerry Gingrich, 28–42. Hershey, PA: IRM Press.

Mahler, Julianne, and Priscilla Regan. 2007. Using virtual collaboration in complex government organizations. Paper presented at the Conference of the American Society for Public Administration, Washington, DC, March 23–27, 2007.

Mahler, Julianne, and Priscilla Regan. 2009. Agency-related blogs as policy networks. Paper presented at the meetings of the American Society for Public Administration, Miami, Florida, March 20-24, 2009.

McAfee, Andrew. 2006. Enterprise 2.0: The dawn of emergent collaboration. *MIT Sloan Management Review* 47, 3:21–28.

Pardo, Thesesa A., J. Ramon Gil-Garcia, and G. Brian Burke. 2006. Building response capacity through cross-boundary information sharing: The critical role of trust. In *Exploiting the Knowledge Economy: Issues, Applications, Case Studies*, ed. Paul Cunningham and Miriam Cunningham. Amsterdam, The Netherlands: IOS Press.

Perlman, Ellen. 2006. The missing link: Using weblogs to give out opinions to public officials. *Governing* 19, 6 (March):50–54.

Snyder, William, Etienne Wenger, and Xavier De Sousa Briggs. 2003–2004. Communities of practice in government: Leveraging knowledge for performance. *The Public Manager* (Winter):17–21.

Chapter 22

E-Government Competencies: Looking beyond Technology

Tino Schuppan

CONTENTS

22.1 E-Government: The Challenge of New Competencies

In recent years, not only has the work of public administration been increasingly penetrated by information technology (IT), but new forms of collaboration and interorganizational public service networks have emerged. These require new skills and techniques for all civil servant groups in public administration. To date, in practice, the topic is still being addressed in a very IT-dominated fashion. The same is true for the scientific community in public management and in administrative sciences, which often very unilaterally still perceives e-government as an IT subject. Nevertheless, in practical projects and in the everyday work of public administration, it is becoming increasingly apparent that new competencies are required that go beyond the simple use of an IT application, or even IT specialist and tool knowledge. A comprehensive change of competency requirements for all civil servant groups can be expected—and is already becoming apparent.

In the practice of public administration, new demands on staff are nothing new; for instance, New Public Management requires managerial knowledge and related methods in particular. Nevertheless, e-government sets new standards in this respect because it demands a new kind of interdisciplinary knowledge. This means that it is no longer sufficient to only possess specialist knowledge of management or IT, knowledge that often exists in public administration. Rather, because of new service structures, new interdisciplinary knowledge and additional social and other competencies are often required. The objective of this article is to identify and specify these new competencies, especially as they relate to non-IT experts.

Until now, these new competencies have hardly been discussed in the academic debate. Only a few academic articles addressing e-government-related competencies or skills exist, and even these often lack the focus of this article. The methodology of this article includes the use of the instruments of competency research, which themselves are oriented on the general methods of the social sciences. In this chapter, competencies are derived from newly arising e-government structures and processes, and are incrementally specified and validated through literature evaluation, semi-structured interviews, case analysis, and case observation, which includes a roles-related determination of competency requirements.

The article will be structured as follows: to begin, the competency concept and its methods will be briefly presented and, using its transformative perspective, the basic outline of new e-government-related competencies will be derived. Second, existing literature will be evaluated against the background of these new requirements in an e-government context. Third, because of the limited academic debate, the results of qualitative interviews with government representatives and experts will be presented in order to determine new competencies. Fourth, competencies will be more exactly specified through the use of two case analyses in which the competencies of different roles within government are explored. To conclude, the results will be summarized and further requirements for e-government and e-government related competencies will be given.

22.2 Basis of E-Government Competencies

In the following section, the competency concept is first clarified so as to distinguish it from related concepts such as qualifications, knowledge, or skills. On this basis, an initial classification of e-government-related competency needs is derived. Such an initial classification is necessary because few research results exist that are usable for the purposes of this article, as the literature evaluation carried out below will show.

22.2.1 The Competency Approach

Because of the increasing importance of lifelong learning, the competency approach is enjoying a worldwide boom, as it can make learning that has taken place outside of formal education processes more visible [Gnahs 2007, p. 16; van der Klink, Schlusmans, and Boon 2007, p. 231]. In Europe in particular, the competency concept has become important in establishing comparability between educational degrees issued in different countries [Winterton, Delamare-Le Deist, and Stringfellow 2006]. When applied in professional life, the competency approach takes into account what a person really can do in a working context, regardless of how this knowledge was acquired. Instead of paying attention exclusively to formal qualifications and degrees, which differ throughout Europe, skills, techniques, expertise, and know-how are becoming more important [European Institute for Public Administration 2005; Winterton, Delamare-Le Deist, and Stringfellow 2006]. In other words, the qualification concept is input-oriented, while the competency concept is output-oriented, i.e., regardless of formal degrees.

However, despite increasing interest in the competency approach, the term itself is multifaceted, complicating its application. In particular, the terms competency and competence are often used inconsistently [see Hoffmann 1999, p. 276; Rowe 1995, p. 12]. While the term "competence" is defined as the ability to fulfill a task to a certain, often specifically defined standard, in comparison competency designates the underlying attributes of a person, such as knowledge, skills, and abilities needed to fulfill competence standards [Hoffmann 1999, p. 276]. Core elements of the competency concept include not only competence, competencies, knowledge, skills, and abilities, but also personal qualities (such as disposition) as well as values and motivations [Cooper 2000; Gnahs 2007, p. 24, Murray, Clermont, and Binkley 2005, p. 36]—indicating that skills are only a subset of competencies [Rowe 1995, p. 15]. For clarification, an overview of the definition of competence, competency and their related concepts and terms is provided in Table 22.1.

Table 22.1 Terms and Concepts Related to Competence and Competency

Term	*Definition*	*Example*
Competence	A standard of performance, usually specifically defined.	Competence as a project manager
Compentency	The knowledge, skills and abilities required of a person to carry out a task or set of tasks to a degree of competence.	Technical competencies
Skill	Proficiency in successfully carrying out a specific skilled task.	Skill in programming in C++
Ability	The ability to do something, which may be skilled or unskilled, learned or intrinsic.	The ability to think in abstract ways.
Knowledge	An understanding of a subject on an intellectual level.	Knowledge of the history of computing.

Basic types of competencies include technical, social, personal, as well as methodological elements that (as will be shown) are all relevant for e-government in different forms [see Winterton, Delamare-Le Deist, and Stringfellow 2006, p. 52]. Technical competencies include essential organizational and process techniques and knowledge as well as techniques and knowledge specific to a workplace or task. Social competency has gained in general importance during the last few years and means the ability to act appropriately in a given situation, especially to work in a team and to cope with conflicts, but also to possess communicative abilities. Personal competency includes qualities such as being able to evaluate and organize oneself and to be proactive. Finally, methodological competencies include being able to independently find solutions to complex working tasks and to apply and to reflect about them; and on the other hand, the ability to independently gain appropriate new knowledge, skills, and techniques [Riedl 2004, p. 16; Kauffeld and Grote 2002, p. 32; Gnahs 2007, p. 27]. In addition to the mentioned competency types, numerous partial competencies exist, which, when taken together, result in a complete competency profile required for a particular workplace. Furthermore, different competence levels (e.g., novice to expert) or learning steps (e.g., knowing something, understanding it, applying it or evaluating it) can be distinguished [Balzert 1999; Dreyfus and Dreyfus 1986].

With regard to e-government competencies, not only is new knowledge necessary, but also new skills and techniques, which are methodologically difficult to determine. Determining these competencies in a way that is closely tied to real-world working conditions is methodologically difficult, and this is even more so the case when attempting to draw conclusions about future competency requirements. Paradoxically, although an early determination of future competency requirements is generally methodologically difficult, there is a great need for such an effort so that public administration can anticipate these developments and incorporate them in its human resource planning.

The methods used to determine competencies include workplace analyses and observations as well as expert surveys [see Lantz and Friedrich 2003; Schaper 2003]. The final method is most appropriate for future-oriented requirements and was therefore employed for this chapter. Future-related competency statements can be also derived from new production and service structures as well as processes, at least to a certain extent. These are then complemented and made more specific through case analyses of innovative projects. This means that no "best method" exists for the deduction of competency requirements.

In administrative practice, the competency concept often still has only a modest importance. In particular in German administration, as well as in other continental-European administrations dominated by a legalistic tradition, formal qualifications and degrees play a predominant, central role. In cases where necessary competencies do not exist, or exist to an insufficient degree, external expertise in the form of consultant expertise or external service providers is purchased. However, just in consideration of the rapid changes in working work—not least caused by IT itself—the further development of competencies within public administration is as imperative as ever. This is because outsourcing, for example, does not mean that fewer competencies are required internally, but rather that a higher level of or different competencies are required, owing to the requirements of purchasing and management of the (outsourced) services [Farneti and Young 2008; OECD 2005, p. 130 and 136]. In other words, missing internal expertise can only be compensated for by externally acquired competencies to a limited extent.

22.2.2 E-Government Requirements

New competency requirements are not only based on the increasing degree of IT penetration of public administration work in and of itself, but also on further potential in the application

field [Lenk 1998; Lenk 2002]. At the same time, it is important that, when compared to a more traditional use of IT, e-government has transformational potential for governance and administration [see O'Neill 2008]. In particular, new IT enabled organizational forms are possible. These organizational forms can be seen to some extent in public service provision, which require new competencies. Furthermore, through extensive data exchange, the informatization of working processes and new IT functions enable new forms of task execution. Both of these possibilities and the new competency requirements that arise from them are explained in more detail in the following.

New organization forms are possible in particular because processes can be designed in an interorganizational way that questions previous principles of organizational design. Specific organizational concepts are, for instance, the division of the provision of public services into a front and back office to improve accessibility, or the establishment of shared service centers in order to achieve economies of scale [Lenk and Traunmüller 2001; Schuppan 2009]. Also, outsourcing and insourcing questions can be answered in new ways, because improved tracking and control possibilities and reduced transaction costs mean that expanded outsourcing and insourcing possibilities exist [Schuppan 2008; Culbertson 2005, p. 103]. Regardless of the type of new service structure, implementing these new, more networked organizational forms in light of various technical, institutional, and legal requirements increasingly requires so-called mixed competencies. These competencies draw on knowledge in several different areas (information technology, interorganizational process design, and, if necessary, the corresponding law). However, not only are technical knowledge and the corresponding methodological knowledge required, but social and personal competencies also play a role, because with increasing networks and interlinkages, the number of social interactions increases. In other words, these new forms of collaboration and cooperation with other persons and institutions require qualities such as being able to work in a team or to cope with conflicts to a greater extent than previously was the case. Personal competencies, which refer to the personal characteristics of the individual, as for example his or her organization and abstraction ability, are also closely connected to this development.

In the same way, new technical as well as social competencies are necessary to work within the new service structures because they are accompanied, for instance, by more division of labor. Thus, the front office staff must cover a broad range of activities, while the operations in a shared service center or in the back office are more narrowly specified. Job responsibilities change, and new competency requirements do not just arise in connection with organizational-institutional changes. Increasing informatization means that a change in the understanding and execution of technical tasks can be expected. This is due to the fact that the penetration of public administration by IT has brought with it with new functions such as the calculation, analysis, combination and exchange of data, which have increasingly changed the content and character of work in public administration. This had led to a change in the kind of technical knowledge that is necessary to conduct a task, as in the case of using geographic information systems for police criminal investigation work, for example [Willis, Mastrofski and Weisburd 2003]. Through the combination of data about committed offenses with geographic data and mobile data (so-called crime mapping), analyses can be automatically conducted, which makes it possible to dramatically limit the circle of possible suspects. New prevention possibilities are also possible through crime mapping, in turn changing the content of police work. Analogous examples can be also found in other fields and are dependent on the branch of public administration in question (e.g., environmental management, justice management, urban planning with 3D maps, etc.).

Following this basic exploration of areas in which tasks and therefore competency requirements are changing within the context of e-government, an evaluation of existing literature will be undertaken. Thereafter, competencies that are relevant for e-government will be empirically tested and further specified.

22.3 Literature Evaluation

The literature evaluation will examine public management and public governance literature, because it is likely that such literature will include indications of competency requirements, which are also relevant for e-government. This applies to methodological knowledge and competencies related to various networks, which are topics in the public governance debate. Nevertheless, in fact, only meager indications of specific competency requirements are to be found in the general public management and public governance literature. Often, the authors suggest that general economic thinking and knowledge of certain management instruments are required [see Kaul 2000, p. 169; Finger and Uebelhart 1998, p. 29]. IT is understood in public management (if at all) predominantly as a mere tool, which, according to the understanding of these authors, simply supports management instruments. As a consequence, in regard to IT, the public management literature emphasizes competencies that relate to the usage of IT applications.

Aspects related to networks that cut across agencies and organizations, something that is especially relevant for transformational e-government, receive the most attention in public governance literature, but without reference to IT and its repercussions for working processes. Here, social and personal competencies are discussed under the concept of leadership, but in rather general, unspecific terms [see Löffler 2003, p. 243 and 259; Broussine 2003, p. 179], with emphasis on aspects such as presentation ability, new attitudes, thinking in networked structures and so forth. Competency requirements are also considered in the context of networked structures, including how they relate to outsourcing decisions. Reference is made to the necessary competencies associated with tendering, purchasing, and the management of operations.

Articles that specifically address competencies relevant to e-government have only been published since about 2000. However, to date the subject has, for all intensive purposes, not been present in international academic conferences. An evaluation conducted for this article of more than 400 conference contributions from 2003 to 2008* has shown that merely one article [see Leitner 2006] was presented on the subject. This article is based on a previously published study conducted by the European Institute for Public Administration and commissioned by the EU, which is referenced below. The majority of the articles often focus very one-sidedly on pure IT competencies [e.g., Elovaara et al. 2004; Kaiser 2004; Mundy, Kanjo, and Mtema 2001]. Nevertheless, these articles also stress that executives, too, increasingly need this kind of knowledge. A portion of articles specify non-technical competencies, emphasizing process management, owing to the fact that executives often lack a sufficiently detailed understanding of processes [see Parrado 2005]. Only a few contributions address e-government competencies related to interorganizational collaboration, as they were specified at the beginning of this chapter. In these instances, emphasis is placed, in a rather general way, on team leadership skills, informal communication and network skills beyond organizational borders, and the ability to work in interdisciplinary teams and projects [Gupta 2003].

Only a few authors consider new interdisciplinary knowledge or mixed competencies. For instance, Parrado stresses implementation skills combined with integrated, design-oriented knowledge of the interplay between IT and organizations; knowledge of analysis of technical requirements for IT systems; and the ability to apply IT solutions to organizational problems [Parrado 2005]. Similarly, a 2005 study by the European Institute for Public Administration (EIPA) argues that executives must possess the ability to strategically assess IT trends and to evaluate their

* Conferences examined included the International Research Symposium on Public Management (IRSPM), the European Group of Public Administration (EGPA), the Hawaii International Conference in System Sciences (HICCS), and the International Conference on Database and Expert Systems Applications (DEXA).

implications for organizational strategies [European Institute for Public Administration 2005]. Similar results for the United States were found by Settles who especially emphasizes strategic competencies [Settles 2005].

All in all, it can be stated that there are only a few contributions that address the issue of competency requirements for e-government, especially in its transformational dimension. At most, some indications can be found that are limited mainly to executives, even though networked collaboration leads to a high degree of changes at the working level. A consideration of competencies that are closely related to workplace demands and work processes, such as that which is standard in the manufacturing and commercial professions (like the automobile industry), effectively does not yet exist [see e.g., Schaper 2003]. Such a consideration also is not the focus of the mainstream public management or public governance literature, which concentrates more on upper management than on the working level.

Because of the limited nature of the literature, it is clear that e-government, in particular in respect to the networked perspective indicated, requires further inquiry and specification of competencies. Toward this end, in the following section, empirical findings will be presented on which further deductions will be based.

22.4 Survey Results

22.4.1 Methodological Considerations

In the survey conducted for this article, civil servants from a German state (*Land*) and selected external e-government experts were questioned. Interviewing civil servants at the state level is particularly sensible because, according to the division of labor within the German federal structure, the state level is responsible for administering and implementing policies, meaning that they are also the focus of e-government. A total of 28 interviews were carried out in state administrations between September 1, 2006, and October 15, 2006. Nine department heads responsible for e-government and eleven e-government project managers responsible for the implementation of concrete projects were interviewed. Eight so-called e-government ombudsmen, who were created to promote the subject in their respective sphere of activity, were also interviewed. Furthermore, so as to gain an external view of the subject, 12 experts from academia and business consultancies with at least five years of experience in the subject area, as well as recognized e-government experts from public administrations in other states, were interviewed. Thus, the results of the survey of experts can be also used as a frame of reference for the evaluation of the results of the survey of the public administration personnel. All in all, a total of 40 interviews lasting between 60 and 90 minutes were carried out. Semi-structured interviews were conducted using standardized interview guidelines. The content of the questions addressed the following topics:

1. Assessment of existing skills: How do you assess the existing e-government skills in your department or for external experts in public administration in general?
2. Assessment of existing training and continuing education offerings: How do you evaluate the existing e-government offer of education for the civil servants?
3. Estimation of future qualification requirements: What kind of e-government skills and knowledge are necessary in order to face the actual and future challenge of implementing e-government?

An overview of the civil servants and experts interviewed is presented in Tables 22.2 and 22.3.

Table 22.2 Civil Servants Interviewed

Organization	*Department Heads*	*Project Leaders*	*e-Government Ombudsmen*
Ministry of Justice	—	—	1
Ministry of Finance	1	—	—
Ministry of the Interior	2	6	1
Ministry of Labor, Social Affairs and Health	1	1	1
Ministry of Education, Children and Sports	—	1	1
Ministry of Infrastructure and Planning	1	1	1
Ministry of Rural Development, Environment and Consumer Protection	1	—	1
Ministry of Economics	1	1	1
Ministry of Science, Research and Culture	1	1	1
State Chancellery	1	—	
Total	**9**	**11**	**8**

22.4.2 Selected Results

In respect to the current state of competencies within public administration, the survey revealed a heterogeneous picture. The experts and civil servants were predominantly of the opinion that multimedia competency and the level of technology-related knowledge in the administration are, in general, good and sufficient. Extensive internal training courses were frequently offered in recent years, in which almost all civil servant groups participated.

Nevertheless, all of the experts surveyed maintained that a lack of competencies exists at the executive level, a view that is not shared by the department heads questioned. In particular, in the opinion of the experts, the executives are deficient in knowledge of processes, in strategic competencies, and in the ability to think in a networked context as well as the ability to assess the interplay between technical and organizational developments. This was, to a degree, also recognized by the department heads questioned but applied by them to all civil servants. They were of the opinion that the topic of e-government has barely penetrated public administration on an intellectual level. Large deficiencies are especially seen in the ability to develop strategies for

Table 22.3 Overview of Experts Questioned

Position	*Other Public Admin.*	*Private Sector*	*Academia*
Department Head	2	—	1
Lecturer	—	—	1
Manager	—	3	—
Professor	—	—	3
Project Manager	1	1	—
Total	**3**	**4**	**5**

e-government. A lack of understanding of interorganizational processes was specifically named. Furthermore, the project managers also responded that IT related competency is very high in the project teams, while methodological and technical competency in organizational change in the context of e-government is rather less developed.

In respect to necessary technical and methodological competencies, the experts referred in particular to the executives, who need skills to develop and implement e-government strategies and who, at the same time, must possess knowledge about processes at the working level. Experts also called for new management competencies in order to plan and orchestrate services, processes, and IT resources in a public service network. Furthermore, the department heads questioned mentioned the ability to assess new IT trends and related potentials and to derive organizational possibilities from them. In respect to social competencies related to e-government, all interviewees mentioned communication skills, new leadership abilities, and the ability to work in team structures. The civil servants considered the following competencies to be necessary: the ability to follow technological change and to independently acquire new knowledge about these changes, so as to keep up with these highly dynamic changes in the e-government era. Finally, the project managers mentioned methodological knowledge as being important; in particular, knowledge of methods of how e-government projects can be better planned and steered in light of their complexity. A list of all competencies cited by the different groups as relevant to e-government questioned can be found in Table 22.4.

22.4.3 Reflection

The survey results have shown that, to some degree, considerable competency gaps exist. While IT competency in the use of office applications is generally considered to be good, if not always sufficient, considerable gaps exist in the areas of strategy, organizational behavior, and processes. With regard to new competencies in particular, the executives were mentioned as a relevant target group that requires strategy and design competencies more than anything else. In particular, the integrative understanding of IT and processes (i.e., mixed competencies) were estimated to be important. Thus, it becomes apparent that executives also need knowledge about the possible applications and opportunities of IT architecture and operational process knowledge, so as to understand coming changes and make strategic decisions. The governance-related leadership literature especially neglects this aspect, either ignoring it or assuming, more or less explicitly, that operational knowledge is not necessary for strategic skills.

It is apparent in the survey results that, as in the literature, the interviewees hardly address changes for the working-level civil servant, even though this is where changes in connection with

Table 22.4 Competencies, Skills, and Abilities Cited as Relevant to E-Government

Department Heads
Fundamentals of e-government; privacy protection; data security; the ability to follow technical change; the ability to independently acquire and adapt new knowledge; the ability to gain an overview of the specific solutions available on the market; an understanding of the interrelationship between IT and organization; a recognition of the added value and opportunities of IT; methodological knowledge; organizational skills; theories of organization; project management skills; strategic perspectives; technical competencies; the ability to convey ideas, concepts and motivations; knowledge of workflows
Ombudsmen
Management accounting; assessment of framework conditions for e-government; the ability to estimate potentials; flexible thinking; process optimization; the application of IT in general; marketing; customer orientation; planning skills and knowledge; problem-solving skills; project management; strategy development; teamwork; vision; economic considerations
Project Managers
A general "expansion of horizons"; general media competencies; analytical abilities; management accounting; leadership abilities; thinking in terms of processes and workflows; IT Infrastructure Library (ITIL); IT Service Management (ITSM); IT fundamentals; knowledge of IT, esp. for the leadership level; knowledge about the handling of knowledge; knowledge about increasing logical thinking and memory skills; knowledge about working creatively; knowledge of methods of knowledge transfer; cost-benefit analysis; monitoring new technologies and e-government developments; project organization; project management tools; process modelling; structured thinking; technical competence and understanding of the possibilities of applying technology; economic considerations
External Experts
Project budgeting; developing business plans for e-government; IT fundamentals for managers; feasibility training; management skills; the ability to work within a network; network technologies; organizational competencies; outsourcing competencies; project management, including project financing; an understanding of working processes and process management; risk management in projects; strategic planning; strategic IT management; contract management; electronic workflow management

e-government first occur. One explanation could be that, in practice, many new IT-based service structures are still in their beginning stages and have not yet become fully operational. The survey also shows that, in practice, a well-developed awareness of the coming and now-emerging changes exists, and that e-government is no longer just a topic for experts within public administration.

22.5 Case-Related Evaluation of Competencies

In order to more exactly specify competency requirements, a perspective that is closer to the working level and project activities is necessary, as is a target-group analysis that will be used to conceptualize role-based competencies. Two cases serve as an empirical basis to pursue such an approach: the introduction of electronic vehicle registration in Germany and the introduction of an electronic record management system (ERMS) in a ministry of a federal state. Both

projects were selected because—as it shall still be shown—they are considered in Germany to be outstanding projects, owing to their ambitious objectives and depth of implementation and because of their interorganizational character. Moreover, the two projects are in different phases of implementation: While the first project is still in the concept phase, in the second project, employees are already working with a new system. Therefore, in the first project, more implementation-related competencies were identified, whereas in the second project, more operational and execution-related competencies in respect to e-government could be identified. Competencies will be specified by not only using executives, but also working-level civil servants and project managers as reference target groups. Data for these cases were collected through observation of the project and new working processes, especially through semi-structured interviews with involved civil servants, and competencies were then determined based on observations and further derivations. Additional competencies were derived inductively and through further conceptual-analytic considerations. In the following section, the project is briefly described so that, thereafter, the competencies required for it can be determined using the aforementioned approach.

22.5.1 Online Vehicle Registration in Germany

22.5.1.1 Project Description

The vehicle registration project started in 2006, within the scope of the much larger "Germany Online" initiative, with the purpose to integrate data and processes across different government levels ("Joined-Up Government"). The concrete goal of the project is to make the electronic registration of vehicles possible across administrative levels through networking, jointly-used data bases, uniform electronic access, and wide-reaching, comprehensive automation. In the course of the project, back-office processes should also be reformed interorganizationally so as to reduce costs.

Presently, the registration and deregistration of vehicles in Germany is carried out by approximately 10,000 employees in approximately 450 local registration offices. All in all, 26 million transactions take place per year. The most frequent processes are the decommissioning of vehicles (approx. 11 million), change of ownership (approx. 8 million) and the licensing of new vehicles (approx. 3.5 million). Between 2006 and the beginning of 2009, the project passed through numerous concept and consultation stages. In an early variation, online licensing was to take place by means of transaction numbers. Later, an implementation with electronic vehicle documents, such as smart cards, was favored with central Web access and, as much as possible, automated execution. To date, basic features such as the introduction of electronic vehicle documents and the greatest possible retention of the responsibilities of the individual organizations have been determined.

The project is not only challenging because of the technology involved, but also because of the complex stakeholder structure. All administrative levels as well as private stakeholders are involved in different forms and roles in the provision of services. The federal level is responsible for legislation, whereas the states independently and autonomously implement and administer the law. The states, in turn, have passed responsibility for the direct provision of registration services to the counties and municipalities so as to provide services that are close to the citizen. Municipalities are involved to a degree, for instance, in smaller processes, such as name changes in the licensing certificates. Further actors include authorities such as tax offices (due to the vehicle tax); custom authorities (when importing vehicles); and various working groups between the different states and between the federal and the state level that work to improve legal aspects of vehicle registration. Private actors such as license plate producers, vehicle inspection organizations, car insurance companies, and others are also involved.

Due to the huge number of stakeholders and their divergent interests, management of the project is extremely demanding, even if changing the process of the vehicle registration seems simple at first glance, because the smallest process change has numerous subsequent effects (positive as well as negative) for the internal processes of the respective stakeholders. Hence, the competencies necessary for the implementation of the project are especially challenging in this case.

22.5.1.2 Identified Competencies

For the executives who are responsible for the project, it appears that leadership abilities, which most public governance literature generally calls for, are generally necessary, but to a greater extent than called for in the literature. Furthermore, the executives need leadership knowledge, which is much more specific than the general competencies called for in the governance literature, including detailed knowledge of processes and the application potentials of IT so that they are able to understand the design of e-government, to adapt it if necessary, and to communicate with experts in the field. This is particularly evident in the fact that, in critical project phases, it was even necessary for the Deputy Minister to personally communicate reforms to the technical experts in vehicle registration departments at other government levels. This was necessary because in the German federal system, government levels possess a high degree of organizational autonomy so that hierarchy cannot be used to enforce reforms stretching across different levels of government. Therefore, distinct bargaining skills and the skill to convince other decision-makers were also required. Competency in the specifics and design of e-government projects combined with specialist knowledge were needed as well. Without these competencies, it is hardly possible to convince the professional level. High levels of persuasive ability, combined with detailed and specialized knowledge, was essential in the interplay of technical demands, legal requirements, and frameworks and organizational changes.

The project leader had to master some special challenges, because he had to coordinate and reconcile various factors such as the knowledge of the IT specialists, organizational goals, particular technical requirements and legal issues in order to develop a coherent, consistent, and implementable concept. He needed to master different technical fields, sometimes to a very high degree, to be able to understand, incorporate, and integrate the different contributions of the experts involved in the project and be able to communicate these to others.

In regard to competencies required in the implementation of projects, the case study shows that simple "good" project management is no longer sufficient. Rather, due to its complex stakeholder structure, the project requires, to a greater extent than other types of projects, communication abilities, negotiations abilities, and presentation abilities. Certain personality characteristics are also required to an increasing extent, such as the ability to withstand conflicts. This is all compounded by the multi-level nature of the project: To a great extent, it was necessary to bring the different rationalities of the stakeholders, with their respective technical perspectives, into alignment to meet a joint objective. In this process, the technical requirements described above arose in overlapping, staggered waves: IT questions were overlapped by process organizational and juridical questions, or arose at a later point in time, or could only be addressed in an integrated way to a limited extent. This required a well-developed sense of thinking in networks, combined with a mixture of technical competencies. Finally, these waves of IT, technical, and organizational challenges had to be constantly harmonized with political requirements and windows for change in administrative levels involved in the project.

The working level was included in the project in order to give technical inputs regarding the reorganization of working processes. To do this, they required the knowledge necessary, to assess

their own professional processes against the background of IT-generated possibilities (such as Web portals, electronic license plates, e-documents, etc.) and to provide design impulses from a professional view. They needed to reassess their own processes against the background of IT, requiring a new, technical, self-reflection related to their own working processes, in particular in regard to their network-based potential. That means that employees also need mixed technical competencies, in particular if they are involved in project work. With regard to social competencies, the project has shown that, for the operational level, enhanced team-working and cooperation abilities are becoming increasingly necessary, even in the conception phase of a project.

22.5.2 Electronic Record Management System

22.5.2.1 Project Description

An electronic record management system (ERMS) was introduced in the interior Ministry of a German federal state in 2006, and has been continuously improved and expanded since then. The immediate goal of the project was to reduce expenses that arise due to the archiving of paper records, which is required by law, and to reduce paper consumption. Although many documents are already electronically available today, these must nevertheless be printed out and bound in a paper file. Until the introduction of the ERMS, the paper record was deemed to be the legally binding "documentation" of a workflow. Finally, it was hoped that the project would accelerate working processes and reduce processing times.

This project was selected for this chapter because it is considered to be an outstanding example of e-government project in a German ministry, both in regard to its depth and consequences of its implementation, and has received an award in a German e-government competition. Because the system now has about 2,500 users, it is especially well suited to drawing determinations about competencies related to the use of e-government applications in everyday administration work. Since the introduction of the system, all documents belonging to a particular case are generated, retrieved, administered in compliance with auditing standards, and, to a large extent, processed without media discontinuity so that internal ministerial processes (such as obtaining a co- or authorizing signature) are carried out completely electronically.

Although it was not the direct intention of the project, the introduction of the ERMS has, to some extent, fundamentally changed the working processes. To a degree, it is possible to work on cases in parallel. Documents can be easily researched and located, substantially decreasing wait times. A new degree of transparency has also arisen. Employees can immediately see the status of a case and track its progress. Introducing the system required not only a high level of IT investment, but also a large training effort for employees. At first, employees hardly accepted the new system, not only due to insecurity about the use of the new system, but also because of the new ways of working which were tied to the system; something which points to changes in required competencies.

22.5.2.2 Identified Competencies

Because work processes were directly changed by the new ERMS, employees at the working level were initially those directly affected. In addition to the use of the application, new operational working steps such as creating electronic files and entering meta data or determining and following up on new workflows needed to be learned. This demonstrated that the handling and processing of cases or tasks must be understood in a comprehensive working context which crosses department

borders. Specifically, workflows must be conceptualized in advance and the status of a particular case must electronically observed and, if necessary, reacted to. Employees must be able, to a greater extent than currently, to view their own actions in relation to other process steps. In other words, the ERMS has induced a new and higher capacity for abstract thinking and understanding of processes on the part of the working level. In particular, it is necessary to be able to place their own actions into a context that includes the preceding and successive working steps of other authorities or personnel. At this point, new cooperation and team-working skills are also required at the working level, something supported by the introduction of collaborative forms of work also between departments. Thus, it could also be observed that, in contrast to more traditional working processes, self-organization abilities at the working level were increasingly required.

Executives as, for example, department heads or deputy ministers, were also affected to a great extent by the introduction of the ERMS. They have also experienced direct changes, because they too must now use the new system. Working steps such as attaching electronic memos, giving specific instructions in a particular case, or applying an electronic signature to a document must be carried out by the executives themselves, and on their own. Some executives perceived this as being an effective weakening of their hierarchical position. This view is additionally strengthened by the expanded tracking options of the staff members, since they can now instantly track when documents were handled by superiors or were signed. New leadership competencies thereby also arise. A more cooperative leadership style is required. Fewer direct instructions are issued, but more subject-related communication occurs, so that in this respect, new leadership requirements (at least rudimentary ones) can already be observed.

Competency requirements for project leaders during the implementation of the ERMS are comparable to those of the vehicle registration project. To implement the project successfully, it was important that the project leader continued to guide and steer the process after the pilot phase to prevent backsliding into old work patterns. At this point considerable communication and persuasive work is necessary. A high degree of consistency and follow-up was also necessary to achieve the routinization of the new electronic working processes in the everyday work of the organization.

22.5.3 Reflection

The projects have shown that a whole array of new competencies are required in connection with e-government, which are relevant for the implementation of projects as well as for everyday work in the new IT-based service structures that follow. All civil servant target groups especially require, in addition to new "mixed" technical competencies, social and personal competencies which indicate more ability to self-organize, work within a team, cooperate, and use new leadership styles. The following results for different civil servant groups can be derived as a main conclusion from these cases:

- *For executives:* General leadership skills, as often called for in the Public Governance literature, are barely sufficient. Instead, the cases have shown that interdisciplinary specialist knowledge, which is sometimes very detailed, is required in order to be able to successfully perform a leadership role in the course of project implementation. In this respect, design competencies with knowledge about the possibilities of IT were needed, combined with a well-developed sense of feasible reform options. In particular it is necessary that executives be familiar with new IT-based organizational models and are able to strategically plan their implementation in consideration of the existing actor constellations.

- *For the working level:* Even though the public management and governance literature barely pays attention to the working level, aside from the ability to operate applications, massive changes can be expected also for the working level of public administration. This is because IT-based service structures require a new understanding of work, in particular, the ability to place their own work into a larger context. This is of special importance for the working level, so that they are able to understand the purpose of their work despite digitalization and an increasing division of labor. Also, team competencies are needed more than before, because also the working level must increasingly work in an interdisciplinary, inter-departmental, and collaborative way, either in implementation projects or later within the new IT-based organization.
- *For project leaders:* Project leaders must possess high level of interdisciplinary knowledge. IT and organizational knowledge are also necessary, sometimes in great detail, and this knowledge must include how they are related to each other. Communication skills, persistence, and presentation ability are also needed to implement the new and sometimes very complex service structures.

Table 22.5 displays the most important types of competencies according to the role of the civil servant in question.

All in all, the cases show that technical, social, methodical as well as personal competencies are highly interwoven and that their full potential only unfolds in combination. For instance, communication and negotiation skills are quite closely connected with technical questions, which arose in different waves. In this respect, particularly high requirements arose for project leaders and department heads. At the same time, staff members at the working level must be able

Table 22.5 Overview of Competency Types by Role

		Roles		
		Project Leader	*Working Level*	*Executives*
Competency Types	Technical	Detailed design knowledge (legal, technical, organizational)	Critically questioning their own technical working processes	Knowledge of processes and IT knowledge
	Social	Good negotiation skills, persistence	Participation competency, teamwork ability, self-organization ability	"Tolerance" for reduction in hierarchy, cooperative leadership, persuasive power
	Personal	Thinking in terms of networks, stress resistance	More ability for self-reflection	Increasing abstraction ability
	Methodological	Implementation-competencies and design competencies	Methods for the content-based redesign of their work	Design methods

to re-interpret their technical working requirements against the background of the IT possibilities and to translate these into specific project requirements.

22.6 Summary and Conclusion

Drawing on the competency approach, preliminary conceptual-analytic considerations were made, and changes in the competency requirements related to e-government were derived. These reach beyond the mere use of IT applications, encompassing specialist non-IT knowledge. The literature evaluation that followed showed that new competency and competence requirements are still very highly focused on IT, are still too limited to the requirements for executives and also barely refer to e-government in the context of new service structures. Furthermore, the existing literature often names competency requirements based on plausibility criteria, but does not derive them using empirical methods. Thus, a research need exists that also requires a strong empirical-qualitative approach so as to be able to determine competency requirements to the necessary degree of specificity.

The survey confirmed the statement that a high level of IT expertise and knowledge about IT applications exists in public administration, but that the level of knowledge of processes in combination with IT knowledge and design competency is generally insufficient. These statements could be further specified in the case examples through the reference to different employee groups in the administration. In contrast to the existing literature, it was shown that the working level is especially affected in a way that goes beyond knowledge of IT applications. Staff at this level need a new understanding of work processes and self-organization skills. Project leaders face special challenges, because they must possess very profound interdisciplinary expert technical knowledge and increased social competencies. Executives also require specialist knowledge—sometimes in great detail—to be able to push through projects and to ensure the necessary broader political support.

Looking toward future developments, it can be assumed that the relevance of isolated competencies in IT applications will decrease, on the one hand because this knowledge is already present to very great extent, and, on the other hand, because human-machine interactions will continue to improve. It can be expected that technical expertise will gain in importance, because IT will become an integral, self-evident element of work in public administration. Already, every branch of public administration—security, law enforcement, social services and others—utilizes IT. Additional research is required to determine how the work of the individual branches of public administration has changed through the use of IT and what new competency requirements have arisen as a result. Such studies of competencies that are closely related to the workplace also serve an additional purpose: They provide important indications for the (re-)design of workplaces and application systems in an e-government context. It is becoming clear that the change in competency requirements at issue have much less to do with digitalization and much more to do with new procedures and processes of public administration. This also applies for executives. To date, however, there is a lack of consistent management and control concepts which address digital and spatially distributed work forms and the related competencies.

In closing, the conclusion can be drawn that, with increasing informatization of the work of public administration, isolated IT competencies lose their relevance. This, however, only appears to be a paradox, because knowledge of IT acquires new importance as an integral component of professional expertise. In this context it is clear that the public sector is facing a fundamental re-assessment of the professional competencies required at the working and executive levels.

References

Balzert, H. 1999. *Lehrbuch Grundlagen der Informatik*. Heidelberg: Spektrum Akademischer Verlag.

Broussine, M. 2003. Public leadership. In *Public Management and Governance*, edited by T. Bovaird and E. Löffler. London: Routledge.

Cooper, K.C. 2000. *Effective Competency Modeling and Reporting*. New York: AMACOM.

Culbertson, S. 2005. E-government and organizational change. In *Practicing E-Government: A Global Perspective*, edited by M. Khosrow-Pour. Hershey, PA: Idea Group Publishing.

Dreyfus, H. L., and S. E. Dreyfus. 1986. *Mind over Machine: The Power of Human Intuition and Expertise in the Era of the Computer*. Oxford: Blackwell.

Elovaara, P., S. Eriksén, A.e Ekelin, C. Hansson, M. Nilsson, and J. Winter. 2004. Educational programs in e-government. In *Electronic Government. Third International Conference,* EGOV 2004. LNCS 3183, edited by R. Traunmüller. Berlin: Springer.

European Institute for Public Administration. 2005. *Organisational Changes, Skills and the Role of Leadership Required by eGovernment*. Luxembourg: European Institute for Public Administration.

Farneti, F., and D. W. Young. 2008. A contingency approach to managing outsourcing risk in municipalities. *Public Management Review* 10 (1):89–99.

Finger, M., and B. Uebelhart. 1998. Public Management Qualifikationen für öffentliche Unternehmen und Verwaltungen. In *Die Ausbildung zum Public Manager*, edited by K. Schedler and C. Reichard. Bern: Haupt.

Gnahs, D. 2007. *Kompetenzen—Erwerb, Erfassung, Instrumente*. Bielefeld: W. Bertelsmann Verlag GmbH & Co. KG.

Gupta, P. 2003. *Educating the Administrators on E-Governance: The First Step for Success.* Paper presented at International Conference on E-Governance (ICEG 2003), 18–20 December 2003. New Delhi: ICEG.

Hoffmann, T. 1999. The meanings of competency. *Journal of European Industrial Training* 23 (6):275–285.

Kaiser, S. 2004. Qualification requirements in e-government: The need for information systems in public administration education. In *Electronic Government. Third International Conference*, *EGOV04.* Lecture Notes in Computer Science 3183, edited by R. Traunmüller. Berlin: Springer.

Kauffeld, S., and S. Grote. 2002. Kompetenz—ein strategischer Wettbewerbsfaktor. *Personal—Zeitschrift für Human Resource Management* 8 (11):30–32.

Kaul, M. 2000. *An Outsider's Inside View: Management Reforms in Government: A Review of International Practices and Strategies*. Bruxelles: Capam.

Lantz, A., and P. Friedrich. 2003. Learning in the workplace—An instrument for competence assessment. *The Learning Organization* 10 (3):185–194.

Leitner, C. 2006. *e-Government: People and Skills in Europe's Administration.* Proceedings of the 39th Hawaii International Conference on System Sciences. Hawaii: IEEE.

Lenk, K. 1998. Policy execution in an age of telecooperation. A handbook. In *Public Administration in an Information Age*, edited by I. T. M. Snellen and W. B. H. J. van de Donk. Amsterdam: IOS Press.

———. 2002. Electronic service delivery—A driver of public sector modernisation. *Information Polity* 7 (2–3):87–96.

Lenk, K., and R. Traunmüller. 2001. Broadening the concept of electronic government. In *Designing E-Government*, edited by J. E. J. Prins. The Hague: Kluwer Law International.

Löffler, E. 2003. Leadership im öffentlichen Sektor—nicht nur eine Herausforderung für Führungskräfte. In *New Public Service: öffentlicher Dienst als Motor der Staats- und Verwaltungsmodernisierung*, edited by R. Koch and P. Conrad. Wiesbaden: Gabler.

Mundy, D., C. Kanjo, and P. Mtema. 2001. Meeting training needs for information age reform: Shortcomings of current training provision. In *Reinventing Government in the Information Age: International Practice in IT-Enabled Public Sector Reform*, edited by R. Heeks. London: Routledge.

Murray, T. S., Y. Clermont, and M. Binkley. 2005. *Measuring Adult Literacy and Life Skills: New Frameworks for Assessment*. Ottawa: Statistics Canada.

O'Neill, R. 2008. E-government and the future of public management: The "transformation" formula. Paper for IRSPM'08, Brisbane, Australia. Brisbane: IRSPM.

OECD. 2005. *Modernising Government. The Way Forward*. Paris: OECD Publishing.

Parrado, S. 2005. Skills for electronic service delivery in public agencies. In *Practicing E-Government: A Global Perspective*, edited by M. Khosrow-Pour. Hershey, PA: Idea Group Publishing.

Riedl, A. 2004. *Didaktik der beruflichen Bildung*. Stuttgart: Steiner.

Rowe, C. 1995. Clarifying the use of competence and competency models in recruitment, assessment and staff development. *Industrial and Commercial Training* 27 (11):12–17.

Schaper, N. 2003. Arbeitsproben und situative Fragen zur Messung arbeitsplatzbezogener Kompetenzen. In *Handbuch Kompetenzmessung. Erkennen, verstehen und bewerten von Kompetenzen in der betrieblichen, pädagogischen und psychologischen Praxis*, edited by J. Erpenbeck and L. v. Rosenstiel. Stuttgart: Schäffer-Poeschel Verlag.

Schuppan, T. 2008. Leistungstiefengestaltung im Zeitalter von E-Government. *E-Gov Präsenz* 8 (2):52–55.

———. 2009. Structural change through e-government: Local experiences from Germany. In *Handbook of Research on Strategies for Local E-Government Adoption and Implementation: Comparative Studies*, edited by C. Reddick. Hershey, PA: IGI.

Settles, A. 2005. What skills are needed in an e-world: E-government skills and training programs for the public sector. In *Practicing E-Government: A Global Perspective*, edited by M. Khosrow-Pour. Hershey, PA: Idea Group Publishing.

van der Klink, M., K. Schlusmans, and J. Boon. 2007. Designing and implementing views on competencies. In *Competencies in Organizational E-Learning: Concepts and Tools*, edited by M.-A. Sicilia. Hershey, PA: Information Science Publ.

Willis, J., S. Mastrofski, and D. Weisburd. 2003. C*ompstat in Practice: An In-Depth Analysis of Three Cities*. Washington: Police Foundation.

Winterton, J., F. Delamare-Le Deist, and E. Stringfellow. 2006. *Typology of Knowledge, Skills and Competences: Clarification of the Concept and Prototype*. Luxembourg: Office for Official Publications of the European Communities.

Chapter 23

Electronic Governance: Virtual Locals and Cosmopolitans and the Social Production of Segregated Academic Community

Lynn M. Mulkey and William L. Dougan

CONTENTS

23.1 Introduction

Robert Merton's [1959] theory of "locals" and "cosmopolitans" constitutes in the research literature a legacy for understanding the structure of those relationships that define academic community. Traditionally, locals have been described as responsive to immediate primary group pressures compared to cosmopolitans who are sensitive to a wide range of impersonal mandates [Merton, 1959, p. 371–79]. The theory presumes face-to-face interactions in the construction of such governance. This paper is a sequel to two others [Mulkey, Dougan, and Steelman, 2005a, 2005b] that are similarly grounded in the assumption that virtual and face-to-face roles differ in their orientations concerning the social production of governance [Mok, Carrasco, and Wellman, 2009; Carrasco, Hogan, Wellman, and Miller, 2008; Carasco, Miller, and Wellman, 2008; Mulkey, et al., 2005a, 2005b; Barab, 2003; Barab, MaKinster, and Scheckler, 2003; DeCindio, Gentile, Grew, and Redolfi, 2003; Ferber, Foltz, and Pugliese, 2003; Foltz ands Foltz, 2003; Kling, McKim, and King, 2003; Lamb and Kling, 2003; Zucchermaglio and Talamo, 2003; Hampton and Wellman, 2001; Kazmer and Haythornwaite, 2001; Koku, Nazer, and Wellman, 2001; Baker and Ward, 2000; Blanchard, 2000; Kling and Courtright, 2003; Etzioni, 2000; Kling and McKim, 2000; Williams, 2000; Etzioni and Etzioni, 1999; Kling, Teich, Lee, and Frankel, 1999; Haythornwaite and Wellman, 1998; Komito, 1998; Michalski, 1995; Babbie, 1996; Romm and Pliskin, 1996; Turkle, 1996, 1999; Walsh and Bayma, 1996; Wellman and Salaff, 1996]. In both investigations [Mulkey et al., 2005a, 2005b], virtual bulletin board communication constituted academic community by defining and solving the problem of professional requirements for scholarship, teaching, and service. Talk *about* professional role requirements was shown to be as indispensable to the production of the academy as actual published scholarship, teaching evaluations, and records of university service.

The first of these two studies of the values and normative structure of a virtual academic community confirmed that the classical orientations, as set forth by Merton in 1959, continue to be relevant for accounting for virtual relationships [Mulkey et al., 2005a]. Analyses of data from a large state university showed that contrary to expectations, the virtual context of discourse acted to bring divergent orientations together, and electronic governance forged greater differentiation between them. Hence, the study coined the terms "virtual locals and cosmopolitans." To enhance the ability to generalize findings from the first study, the second study revisited virtual locals and cosmopolitans by examining whether these professional role orientations that remained split would operate differently or not at all depending on the nature of the academic community constituted by the communications [Mulkey at al., 2005b]. Results from this study investigate whether virtual communities are characterized by self-selection and exclusivity, thus, instatiating concomitant localism and cosmopolitanism tailored to meet specific academic functions. These functions may reside in each specific community. Our findings are expected to counter claims that rather than segregating users in a virtual world, the virtual medium extends community by connecting individuals through flexible social networks as opposed to "fixed" groups [Wellman, 2004].

Ongoing research can even further enhance generalizability if the electronic venue appears to serve as a platform for manifesting particular local and cosmopolitan configurations. Generalizations about academic electronic governance await this and continued investigation of the local and cosmopolitan divide as it produces various types of academic community.

23.2 Background

The electronic venue of communication is an opportunity for further specification and respecification of the academé as a social achievement of community [Mulkey et al., 2005a; Foltz and Foltz,

2003; Gatz, 2000; Turkle, 1997; Romm and Pliskin, 1997; 1998; Giles, 1996]. Data from virtual archives have supported investigation of how faculty exchange on the electronic bulletin board, as a context for communication amongst and about members of academia, defines and solves the problem of university governance and community [Mulkey et al., 2005a, 2005b]. The electronic bulletin board has been studied as what may be referred to from a social production perspective as a situated context, perhaps as functionally necessary for the construction of higher education governance as formal contexts for exchange, such as faculty meetings. Such governance consists of a set of practices made sense of in the context of disseminating and creating knowledge, both and all affirmations and disruptions to this activity make the academy recognizable as what we all know it to be. Talk "about" the academic community "is" the academic community; it is not found, but is inseparable from, and embedded in the social apparatus that makes it apparent as one. The bulletin board is as much the occasion for normalizing human relations as is the work of formal modes of governance: faculty meetings [Mulkey and Dougan, 1996].

Historically, the normative/organizational structure of the academy has been characterized in the literature as consisting of "locals" and "cosmopolitans"; a classification scheme useful for understanding how faculty meet professional role demands [Merton, 1959]. Previous application of Merton's constructs to face-to-face contexts appears in the literature [e.g., Grimes, 1970, 2000; Berger, 1973; Flango, 1974; Wright, 1997; Goldberg, Becker, and Rubenstein, 2005; Lammers, 1974]. As a body of experts, faculty must meet standards of behavior and evaluation concerning teaching, scholarship, and service. Responsiveness to these demands has led, on the part of faculty, to the production of two normative role structures: localism and cosmopolitanism [Merton, 1959; Gouldner, 1958; Goode, 1960]. Generally, locals have been described as concerned with immediate primary group mandates and are contrasted with the reactivity to a wider range of impersonal demands displayed by cosmopolitans [Merton, 1959; Wright and Larwood, 1997; Flango, 1974]. Gouldner [1957, 1958], for example, has shown that faculty adhering to professional principles less often expressed allegiance to a specific college or university. In the same manner, Blau and Scott [1962] found that persons strongly committed to a local welfare agency were less likely to question agency directives or to consider leaving their present position. Some research extends the conceptual framework to include the cosmopolitan local [Patterson, 1971] or the local cosmopolitan [Rotondi, 1977]. Still, others have investigated how cosmopolitan-local orientation predicts scientific productivity, organizational productivity, and job satisfaction for scientists and engineers [see Stahl, 1979].

While the local-cosmopolitan theory has been advanced through applications outside the academy, it has been missing in the study of virtual academic community (see, e.g., Nelson and Tallman [1969], who examined the utility of the distinction in explaining why individuals align themselves with their father's political view; see also Zvekic, 1984; London and Cheney, 1977; Roof, 1976; Almy, 1975). A preliminary investigation [Mulkey et al., 2005a] hypothesized that the virtual context would erode, or even eradicate, distinctions between locals and cosmopolitans. It reasoned from the point of view that virtual space appears to make it easier for academics to accomplish their professional goals. Broader institutional resources become more easily accessible, making the need for local approaches for achieving these goals unnecessary. Findings were counterintuitive; electronic governance appeared to impede compromise in the approach to completing mandated tasks. Local and cosmopolitan normative orientations persisted. That is, they were "palpable and pronounced." This finding of the local and cosmopolitan split became the basis for further investigation, namely to generalize further the initial findings. This effort considered whether the virtual medium lends itself to the segregation of professional role orientations for accomplishing the functions of academic community. The investigation ultimately introduced the notion of "virtual locals and cosmopolitans," permitting the generalization of Merton's [1959] groundbreaking observations to virtual discourse. To further establish the utility of these newly

proffered concepts, we conducted a sequel study to test whether they were robust with respect to a "local" bulletin board versus a "cosmopolitan" one. Indeed, this subsequent analysis [Mulkey et al., 2005b] revisited the relevance of Merton's [1959] theory of "locals" and "cosmopolitans" for virtual as opposed to face-to-face academic community. Electronic bulletin board data obtained from the earlier study of faculty at a large state university was compared with observations made of a sample of electronic communications among members of the American Society of Public Administration (ASPA). In keeping with the previous research, this study affirmed that virtual bulletin board communication constitutes academic community by socially producing and solving the problem of professional responsibilities. While e-governance can facilitate coalition in the approach to fulfilling academic responsibilities, localism and cosmopolitanism still persist. The online medium seemed to facilitate the construction of local and cosmopolitan bulletin boards. Subscribers produce environments that define and maintain their norms for achieving institutional goals. Cosmopolitans are consumed with living up to the standards of external reference groups and are less attracted to local considerations. Further research is needed to validate the virtual local/cosmopolitan construct by exploring its appearance in academic communities segregated according to discipline. There is reason to believe that faculty work orientations vary as such in the basic physical and social sciences versus an applied discipline [Neumann and Neumann, 1982; Bevis, 1987; Blau, 1974]. This can tell us something of the general structure of electronic governance as it constructs academia. The relevance of localism and cosmopolitanism professional role orientations for defining and solving the problems of academic communities may appear in varying degrees in different communities or in different virtual communities. Through procedures to reveal the differences, they become further evident and delineated.

23.3 Statement of the Problem

Following previous research [Mulkey et al., 2005a, 2005b] the present study is an attempt to further understand the role of local and cosmopolitan professional role orientations in the creation and maintenance of virtual academic community. In line with this previously cited work, but simultaneously extending it, it posits that faculty subscribers with a local orientation are more inclined to view matters in view of their individual and personal relevance and therefore limit the number of reference groups available to them. Faculty with more cosmopolitan values should tend to be less oriented to their immediate milieu, allowing them a broader range of actual or potential reference groups. For example, cosmopolitans may be preoccupied with external and universally regarded standards for their academic discipline. In contrast, locals may find their valued and rightful place in the production of academic community by providing technical support to bulletin board operations. Overall, communications with a cosmopolitan orientation actually dominated 3 of 4 academic bulletin boards, suggesting the declining significance of localism once academic communities are segregated by discipline. This research documents degrees of localism and cosmopolitanism as they construct three types of academic communities, the hard sciences, the applied professional sciences, and the humanities.

23.4 Method

23.4.1 Data

A content analysis allowed us to test the utility of local and cosmopolitan analytical distinctions in a virtual context. A variety of Listserv archives were considered as candidates for investigation.

The archives were selected using a search process that produced the candidate archives; we wanted ones that contained more than a year of data and the entire history of the community *ab initio*. This was important because the data permits the estimation of the relative role of localism and cosmopolitanism in the construction of the virtual community from local to a less plastic set of relationships. The candidate archives, listed below in Table 23.1, comprise numerous academic public access bulletin boards, some for which we include Web site addresses.

While these sources are not exhaustive, they represent the segregated nature of academic community. This means that knowledge bases and discourse constitute disciplines and these disciplines

Table 23.1 Selection of Public Access Bulletin Boards

Bulletin Board Type	*Web Site (Where Available)*
Academic/Non Academic Mix - Political Agenda	
Whales	
Environment, Technology, and Society	
Bulletin Board for Particular Institutions	
AAUP Communications at Texas Christian University (AAUP-1)	
Some Faculty and Staff Communications at U of Iowa	
Faculty Council at OK State Univ. - Mostly Announcements (FC-B)	
Humanities	
ACHE listserv (Determining Authorship of Text)	
Latin Amer. Studies (LACYORK)	http://listserv.yorku.ca/archives/lacyork.html
Victorian Studies (Victoria)	http://listserv.indiana.edu/archives/victoria.html
Folklore	http://listserv.tamu.edu/archives/folklore.html
History of Cyberspace (CyHist)	http://maelstrom.stjohns.edu/archives/cyhist.html
Historical Archeology (HistArch)	http://lists.asu.edu/archives/histarch.html
Bilingual & Bilingual Education (BiLing)	http://lists.asu.edu/archives/biling.html
Natural Languages of Aboriginal Peoples (Nat-Lang)	http://listserv.tamu.edu/archives/nat-lang.html
Archeology (Arch-1)	http://listserv.tamu.edu/archives/arch-l.html
Society for Ethnomusicology (Sem-1)	http://listserv.indiana.edu/archives/sem-l.html

continued

Table 23.1 (continued)

Bulletin Board Type	*Web Site (Where Available)*
Society for History of Authorship, Reading & Publishing (Sharp-1)	http://listserv.indiana.edu/archives/sharp-l.html
Humanities Topics	
Linguistics (Linguist)	http://listserv.linguistlist.org/archives/linguist.html
Psychology of Art (PsyArt)	http://www.lists.ufl.edu/archives/psyart.html
Underwater Archeology (Sub-Arch)	http://lists.asu.edu/archives/sub-arch.html
Professional Fields	
Nursing Research (NurseRes)	http://listserv.kent.edu/archives/nurseres.html
Landscape Architecture (Larch-1)	http://listserv.syr.edu/archives/larch-l.html
Archives & Archivists	http://listserv.muohio.edu/scripts/wa.exe?A0=archives&D=0&H=0&O=D&T=0
Records Management (RecMgmt-1)	http://www.lists.ufl.edu/archives/recmgmt-l.html
Pediatric Emergency Medicine (Ped-Em-1)	http://listserv.brown.edu/archives/ped-em-l.html
Other Topics	
Tree Physiology	http://listserv.okstate.edu/archives/treephys.html
Sea Turtles (Cturtle)	http://www.lists.ufl.edu/archives/cturtle.html
Paleolimnology (PaleoLim)	http://www.lists.ufl.edu/archives/paleolim.html
Cognitive Psychology (CogPsy)	http://listserv.tamu.edu/archives/cogpsy.html
Isotope Geochemistry (IsoGeoChem)	http://list.uvm.edu/archives/isogeochem.html
Analytical Chemistry (PlasmaChem-1)	http://listserv.syr.edu/archives/plasmachem-l.html
Paleolithic Diets and Relevance to Modern Life (PaleoDiet)	http://maelstrom.stjohns.edu/archives/paleodiet.html
Student Bulletin Boards	
Student (Alumni) Physicians from Texas A&M (AggieDoctors)	
Student (Alumni) Lawyers from Texas A&M (AggieLawyers)	

Table 23.1 (continued)

Bulletin Board Type	*Web Site (Where Available)*
Brown University Graduate Students (GsNotice-1)	
Brown University Community Discussion List (GSComm-1)	
Grad Students at U of IL, Chicago (GradList)	
Technology Based	
Nanotechnology (NanoTalk)	http://listserv.sc.edu/archives/nanotalk.html
Computing Theory (TheoryNt)	http://listserv.nodak.edu/archives/theorynt.html
Use of X-Ray Florescence Machines and Techniques (XRF-1)	http://listserv.syr.edu/archives/xrf-l.html
Public Access Computer Systems (PACS-1)	http://listserv.uh.edu/archives/pacs-l.html
Chemical Information Sources (ChMinF-1)	http://listserv.indiana.edu/archives/chminf-l.html

represent confined virtual spaces, bounded so we can recognize them as the hard and soft sciences, other liberal arts areas such as the humanities, and applied and professional fields. Three bulletin boards were selected as representative of these distinctions and include Plasma Chemistry, Applied Pediatric Medicine, and Victoriana. A sample of e-mail messages, composing 5% (in the case of the Victoriana board) or 10% (in the case of the science boards) of the messages in the archives comprised the study sample (n = 2,002 entries). A previous study [Mulkey et al., 2005b] which employed ethnographic and qualitative approaches for making observations, was now superseded by quantified measures.

23.4.2 Measures

23.4.2.1 Independent Variable

"Academic Community" refers to Plasma Physics (representing electronic bulletin board exchanges between subscribers in the "hard" sciences; Applied Pediatric Medicine (representing exchanges between subscribers in the "applied sciences); and Victoriana (representing exchanges between subscribers in the humanities).

23.4.2.2 Dependent Variable

"Professional Role Orientation" refers to the rating of localism and cosmopolitanism on a 5-point Likert-type scale where a rating of 1 indicates sheer cosmopolitanism—the entry pertains only to the science/discipline. A rating of 2 indicates mostly cosmopolitanism with some localism; the entry deals with the science or discipline and maintenance of the bulletin board but more science/discipline. A rating of 3 is indicative of equal degrees of localism and cosmopolitanism; the message pertains both to the science or discipline and to the maintenance of the bulletin

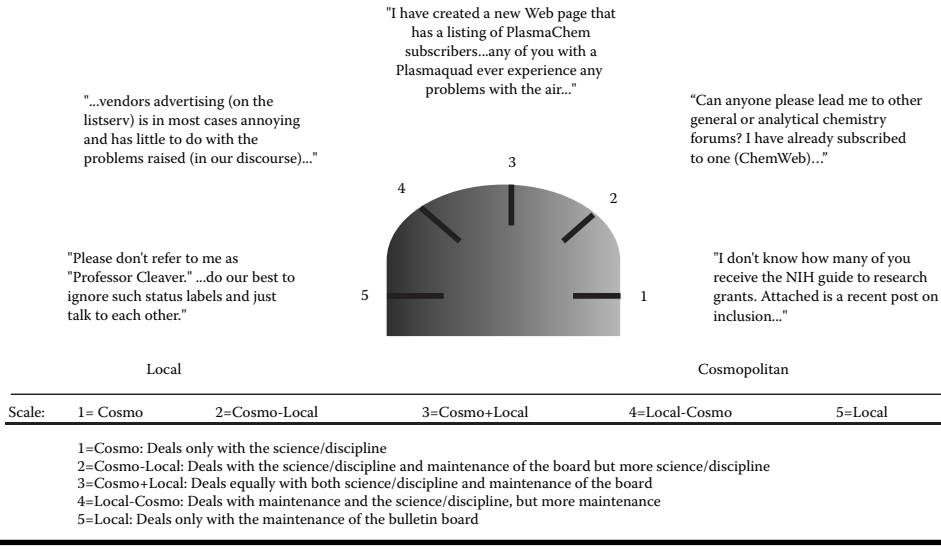


Figure 23.1 This graph displays the intent of the coding scheme through providing specific examples of each numerical category. It is intended to capture on a continuum the degree of localism and cosmopolitanism found in the academic bulletin boards under review.

board. A rating of 4 represents more localism than cosmopolitanism; it corresponds to a message that comprises mostly maintenance of the bulletin board with some reference to the science or discipline. A rating of 5 is indicative of a message that shows only localism, pertaining only to the maintenance of the bulletin board. As a step toward enhanced consistency in coding (reliability) and validity, the operationalization of this variable is more restrictive than in prior research using Thielbar's [1966] early formulations [Mulkey et al., 2005a, 2005b]. Our operationalization is, however, true to and consistent with original formulations where, typically, locals are observed as being responsive to immediate primary group stresses compared to cosmopolitans who are reactive to a broad range of impersonal mandates [Merton, 1959, p. 371–79].

Figure 23.1 shows "shades" of localism and cosmopolitanism by quoting from the bulletin board entries.

Selected entries were coded by independent coders unaware of the hypotheses of the study to obtain a measure of intercoder reliability (r = .78). Further validation of the construct can be established through ongoing research that samples a greater number of academic disciplines.

23.5 Findings and Discussion

Analysis of the three bulletin boards yielded the following results. Table 23.2 presents the mean scores of the messages in the different bulletin boards.

The grand mean was 1.52 with a score of 1.16 for plasma physics, 1.37 for Pediatric Medicine, and 1.71 for Victoriana, respectively. The use of mean scores was useful primarily for showing a degree of cosmopolitanism and localism. Not surprisingly, the proclivity of entries is toward cosmopolitan end of the scale, given that the bulletin board itself may select persons with cosmopolitan professional orientations. Yet, the degree of cosmopolitanism is most pronounced in the applied sciences and least present in the humanities. This pattern suggests the likelihood of less

Table 23.2 Mean Distribution of Professional Role Orientation

Academic Community	*n*	*Mean*
PlasmaChem	367	1.3787
Victoriana	1,166	1.7144
Pediatric Emergency Medicine	487	1.1663
Overall Mean	*n* = 2,020	1.5213

clarity about achieving professional goals in the humanities than in both the applied and hard sciences where knowledge is, relatively speaking, more determinate in nature. Practice requires a substantial amount of precision and formality. To glean a closer look at the dynamics, we present Figure 23.2, which shows results from the cross-tabulation of Professional Role Orientation by Academic Community.

Percentages are graphically represented to reveal a range of cosmopolitan orientation from 78% to 95%, but the variability is further disclosed when one scrutinizes the percentage of

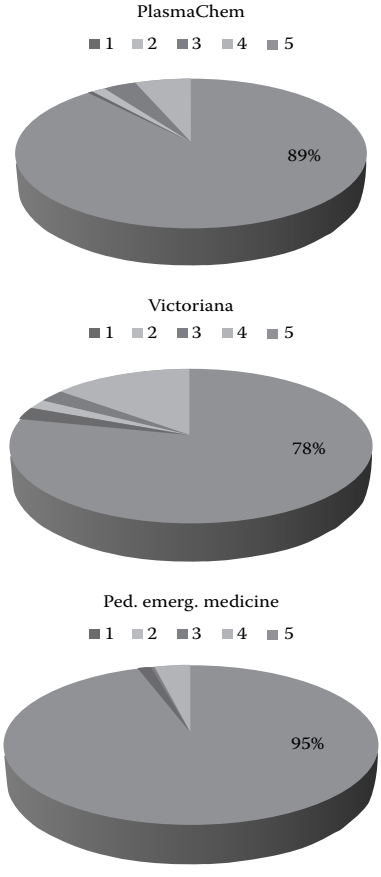


Figure 23.2 Professional role orientation by academic community (in percentages). 1 = Cosmo; 2 = Cosmo Local; 3 = Cosmo + Local; 4 = Local Cosmo; 5 = Local.

purely cosmopolitan orientation versus cosmopolitan orientation with some localism, equal proportions of local and cosmopolitan orientation, localism with some cosmopolitanism, and strict localism. In contrast to findings from prior research [Mulkey et al., 2005a] showing approximately 45% localism, 45% cosmopolitanism, and 10% mixed, the present findings disclose greater degrees of cosmopolitanism. This can perhaps be explained by the former academic community's geographical confinement. The Victoriana bulletin board has a percentage distribution of 14% localism, with 2% to 3%, a mix of both totaling 22% of entries having a non-cosmopolitan orientation. This 22% compares to a 5% non-cosmopolitan orientation for Pediatric Medicine and 11% non-cosmopolitan orientation for Plasma Chemistry. The detection of these differences allows us to understand how various academic communities are produced and maintained.

23.6 Conclusion

This analysis set out to further test the utility of Robert Merton's conceptual distinctions between cosmopolitan and local professional role orientations. Prior research findings lend credibility to the concepts in a virtual venue. In addition to generalizations across academic communities, namely a virtual community geographically situated in a state university [Mulkey et al., 2005a] versus a cosmopolitan community, namely the ASPA [Mulkey et al., 2005b], the present data suggest that localism and cosmopolitanism in professional role orientation more or less persist in all academic communities. Bulletin boards pertinent to the humanities, the professions, and the hard sciences are constructed by varied intensities of localism and cosmopolitanism to meet the academic demands of each respective community. Clearly, virtual community tends to consist of more local than cosmopolitan professional role orientation when the bulletin board is employed by university faculty situated in a particular geographical milieu. When the medium is free from geographical constraints, cosmopolitanism seems to dominate. The variability in and of itself suggests the virtual venue is a means to preserve competing interests of constituent users. The bulletin board does not forge a consolidation of means for achieving professional goals, but rather reinforces discreet boundaries between communities in how they attempt to solve the problems of community. Virtual communities appear to have the need for behaviors that instantiate the community by performing tasks that are largely unheralded but nevertheless essential. Thus, virtual communities need those members who achieve a degree of membership by performing the tasks that enable the cosmopolitans to manifest the more traditionally recognized behaviors constituting academé.

What also follows from the findings is a need for an enhanced conceptualization of Merton's original ideas that distinguishes locals, cosmopolitans, locals with some degree of cosmopolitanism, cosmopolitans with some degree of localism, equal localism and cosmopolitanism, and cosmopolitanism. Ongoing investigation of a larger sample of academic bulletin boards segregated according to discipline can further our understanding. It will confirm or disconfirm the validity of these professional role orientations for the virtual production and maintenance of academic community.

Acknowledgments

The authors would like to thank Fred Leyda and J. Franklin Rutherford for technical assistance.

References

Almy, T. Local-cosmopolitanism and U.S. city managers. *Urban Affairs Quarterly, 10*:243–272, 1975.

Babbie, E. We are a virtual community, *American Sociology, 27*: 66–72, 1996.

Baker, P. and Ward, A. Community formation and dynamics in the virtual metropolis, *National CivicReview, 89:* 203–221, 2000.

Barab, SA. An introduction to the special issue: Designing for virtual communities in the service of learning, *Information Society*, 19, 197–202, 2003.

Barab, SA., MaKinster, J.G., and Scheckler, R. Designing system dualities: Characterizing a web-supported professional development community, *Information Society, 19*: 237–257, 2003.

Berger, P.K. Cosmopolitan-local: A factor analysis of the construct, *Administrative Science Quarterly,* 18, 223–235, 1973.

Bevis, M.E. and Kirchhoff, K. Role development in an applied discipline: clinical nurse researchers, Current *Research on Occupations and Professions,* 4, 69–86, 1987.

Blanchard, A. *Research Report: Sense of Virtual Community in Listservs and Newsgroups* http://personal.uncc.edu/alblanch/researchreportforVCs.htm, 2000.

Blau, J.R. Patterns of communication among theoretical high energy physicists, *Sociometry 31*, 391–406, 1974.

Blau, P.M. and Scott, W.R. *Formal Organizations.* San Francisco: Chandler, 1962.

Carrasco, J.B., B. Wellman and E.J. Miller. How far and with whom do people socialize: Empirical evidence about the distance between social network members, *Transportation Research Record, #2076*, 2008.

Carrasco, J., B. Hogan, B. Wellman, and E.J. Miller. Agency in social activities interactions: The role of social networks in time and space. *Tijdschrift voor economische en sociale geografie, 99* (5):562–583, 2008.

DeCindio, F., Gentile, O., Grew, P., and Redolfi, D. Community networks: Rules of behavior and social structure, *Information Society, 19*: 395–407, 2003.

Etzioni, A. E-communities build new ties, but ties that bind, *The New York Times*, 149 (51294), 2000, p.7.

Etzioni, A and Etzioni, O. Communities: Virtual versus real, *Science 277*, 295–298, 1997.

Etzioni, A and Etzioni, O. Face-to-face and computer-mediated communities: A comparative analysis, *Information Society, 15*, 241–249, 1999.

Ferber, P., Foltz, F., and Pugliese, R. The politics of state legislature web sites: Making e-government more participatory, *Bulletin of Science, Technology, and Society, 23*: 157–168, 2003.

Flango, V. The dimensionality of the cosmopolitan-local construct, *Administrative Science Quarterly,19*, 198–210, 1974.

Foltz, F. and Foltz, F. Religion on the Internet: Community and virtual existence, *Bulletin of Science, Technology and Society, 23*: 321–331, 2003.

Gatz, LB. Academic and social integration in cyberspace: Students and e-mail, *The Review of Higher Education 23*, 2000.

Giles, M.W. From Gutenberg to gigabytes: ScholarIy communication in the age of cyberspace, *The Journal of Politics 58*, 613–626, 1996.

Goode, W.J. A theory of role strain, *American Sociological Review, 25:* 483–400, 1930.

Gouldner, A, Cosmopolitans and locals: Toward an analysis of latent social roles - I, *Administrative Science Quarterly 2*, 281–306, 1957.

Gouldner, A, Cosmopolitans and locals: Toward an analysis of latent social roles - II, *Administrative Science Quarterly, 2*, 444–400, 1958.

Hampton, K. and Wellman, B. Long distance in the network society: Contact and support beyond Netville, *American Behavioral Scientist, 45*: 476–493, 2001.

Haythornwaite, C. and Wellman, B. Work, friendship and media use for information exchange in a networked organization, *Journal of the American Society for Information Science, 12*: 1101–1115, 1998.

Kazmer, M.M. and Haythornwaite, C. Judging multiple social worlds: Distance students online and offline, *American Behavioral Scientist 45*: 510–530, 2001.

Kling, R. The Internet for sociologists (in features essays, the culture of cyberspace), *Contempcrary Sociology, 26*, 434–444, 1007.

Kling, R. Special informatics: A new perspective on social research about information and communication technologies, *Prometheus,* 18.

Kling, R. and Courtright, C. Group behavior and learning in electronic forums: A sociotechnological approach*, Information Society, 19*: 221–136, 2003.

Kling, R. and McKim, G. Not just a matter of time: Field differences and the shaping of electronic media in supporting scientific communication, *Journal for the American Society for Information Science, 51*, 1300–1321, 2001.

Kling, R., McKim, G., and King, A. A bit more to it: Scholarly communication forums as socio-technical interaction networks*, Journal for the American Society for Information Science and Technology, 54:* 47–68, 2003.

Kling, R., Teich, AI., Lee, Y.-C, and Frankel, M.S. Assessing anonymous communication on the Internet policy deliberations, *Information Society, 15*, 79–93, 1999.

Koku, E, Nazer, N., and Wellman, B. Netting scholars: Online and offline, *American Behavioral Scientist, 44*: 1752–1775, 2001.

Komito, L. The net as a foraging society: Flexible communities, *Information Society, 14:* 97–107, 1998.

Lamb, R and Kling, R. Reconceptualizing users as social actors in information systems research, *MIS Quarterly, 27*, 197–226, 2003.

Lammers, C.J. Localism, cosmopolitanism, and faculty response, *Sociology of Education 47*, 129–158, 1974.

London, M. and Cheney, L. The relationship between cosmopolitan local orientation and job performance, *Journal of Vocational Behavior, 11*, 182–195, 1977.

Merton, R.K. *Social Theory and Social Structure*, Free Press, Glencoe, IL, 1959.

Michalski, J. What is virtual community? *New Perspectives Quarterly, 12*, 44–47, 1995.

Mok, D., J. Carrasco, and B. Wellman. Does distance still matter in the age of the Internet?" Forthcoming, *Urban Studies*, 2009.

Mulkey, L.M. and Dougan, W.L. Science as it consists of normalized practices, *American Sociologist*, 27, 56–61, 1996.

Mulkey, L.M., Dougan, W.L. and Steelman, L.C. Electronic governance: Locals and cosmopolitans "in and as" a virtual academic community*," International Journal of Public Administration, 28*: 703–721, 2005a.

Mulkey, L.M., Dougan, W.L. and Steelman, L.C. Revisiting virtual locals and cosmopolitans "in and as" electronic governance: A comparative analysis of the social production of an academic community, in David Garson, editor, *Handbook for Public Information.* CRC Press, 2005b.

Nelson, J.I. and Tallman, I. Local-cosmopolitan perceptions of political conformity: A specification of parental influence, *American Journal of Sociology, 75*,193–207, 1969.

Neumann, Y. and Neumann, L. Faculty work orientations as predictors of work attitudes in the physical and social sciences, *Journal of Vocational Behavior, 21*, 359–365, 1982.

Norris, P. The bridging and bonding of on-line communities, *Harvard International Journal of Press/ Politics,7*, 3–14, 2002.

Paccagnella, L., Getting the real of your pants dirty: Strategies for ethnographic research on virtual communities, *Journal of Computer Mediated Communications, 3,* 1997.

Patterson, J. The cosmopolitan local: A reanalysis of the construct, *Kansas Journal of Sociology*, 7, 70–79, 1971.

Robertson, L.S. Organizational cosmopolitanism and innovativeness, *Academy of Management Journal, 26,* 332–339, 1983.

Romm, C.T. and Pliskin, N. Diffusion of e-mail: An organizational learning perspective*, Information and Management, 31*, 37–47, 1996.

Romm, C.T. and Pliskin, N. Virtual communities and society: Toward an integrative three phase model, *International Journal of Management, 17*, 261–271, 1997a.

Romm, C.T. and Pliskin, N. Toward a virtual politicking model, *Communication of the ACM, 40*, 95–101, 1997b.

Romm, C.T. and Pliskin, N. Electronic mail as a coalition-building information technology, *Transactions on Information Systems, 16,* 82–101, 1998.

Roof, W.C. Traditional religion in contemporary society: A theory of local-cosmopolitan plausibility, *American Sociological Review, 41,* 195–208, 1976.

Rotondi, L., Jr. Reference groups and local cosmopolitanism, *Social Behavior and Personality, 5*, 257–262, 1977.

Sahl, M.J. Cosmopolitan-local orientations as predictors of scientific productivity, organizational productivity, and job satisfaction for scientists and engineers, *EE Transactions on Engineering Management, 26*, 39, 1979.

Thielbar, G. Localism-cosmopolitianism: Social differentiation in mass society. Ph.D. dissertation, University of Minnesota, 1966.

Turkle, S. Multiple subjectivity and virtual community at the end of the Freudian century, *Sociological Inquiry, 01*: 72–85, 1997.

Walsh, J.P. and Bayma, T. Computer networks end scientific work, *Social Studies of Science, 26*, 661–703, 1996.

Wellman, B. and Salaff, J. Computer networks as social networks: Collaborative work, telework and virtual community, *Annual Review of Sociology*, 22: 213–238, 1996.

Welsh, S. Deliberative democracy and the rhetorical production of political culture, *Rhetoric and Public Affairs, 5*, 2002.

Williams, M. Virtually criminal: Discourse, deviance and anxiety within virtual communities, *International Review of Law, Computers, and Technology, 14*: 95–105, 2000.

Wright, T.A. and Larwood, L. Further examination of the cosmopolitan-local latent role construct, *Psychological Reports*, *81*, 897–800, 1997.

Zucchermaglio, C. and Talamo, A. The development of a virtual community of practices using electronic mail and communicativegenres, *Journal of Business and Technical Communication, 17*: 259–285, 2003.

Zvekic, U. Cosmopolitan and local orientation in the judicial profession, *Sociologjca, 26,* 139–157, 1984.

PERFORMANCE REPORTING

VI

Chapter 24

Transparency and Analysis in Public Budgeting

Carl Grafton and Anne Permaloff

CONTENTS

24.1 Introduction

For more than a half century, public administrators performing budget formulation have been trying to substitute economics-based criteria for politics. Today, the federal government, states, and localities use mixtures of budgeting techniques including classical performance budgeting using workload analysis, program budgeting, and contemporary performance budgeting with its quantitative indicators of outputs and outcomes. Recent reforms and associated techniques such as benefit-cost analysis are facilitated by the increased power of microcomputers and improved spreadsheet, presentation, and statistics software together with computer networks and tailor-made network software. In the past few years, substantial improvements have been made in the Internet dissemination of budgetary information to the public and their legislative and news media representatives.

24.2 The Key Question

According to Aaron Wildavsky [1984, p. 1], a budget is a document containing "words and figures that propose expenditures for certain objects and purposes." Writing in 1940, V.O. Key, Jr. identified the basic problem of budgeting: "On what basis shall it be decided to allocate X dollars to activity A instead of activity B?" [p. 1138]. Both quotes suggest that the amount of total spending for all governmental objects, purposes, and activities is a matter to be determined as part of the budgetary process. Key basically argued that scarce budgetary resources should be distributed to maximize "social utility," but he understood that accomplishing this high-minded objective would be theoretically and practically difficult [p. 1138].

Judgments regarding the allocation of scarce means among government programs are often the center of intense interest group struggles, that is, politics. The total size of budgets and the allocation of funds within budgets are frequently the battlegrounds of elections for legislative and executive office at all levels of government. The budgetary wars continue after new officials are sworn in, and the conflict rarely ends throughout their terms of office.

Budgeting as political conflict often leads to a pattern called incrementalism, which is characterized by small, year-to-year changes in agency and program budgets [Boyne, Ashworth, and Powell 2000]. Such spending adjustments frequently are viewed as reflecting not changing conditions to which government should be responding but inertia mixed with marginal shifts in the balance of power among opposing interest groups.

For well over half a century, critics have argued that governmental budgets should be formulated in a better way than by incrementalism and interest group politics. In particular, reformers have tried to apply the logic of economics to budgeting. Key's description of budgeting as a judgment regarding how scarce resources should be allocated to produce the maximum return in social utility is an early example of this approach.

24.2.1 Economics-Based Reformers versus Pragmatists

Since Key wrote, and even before, the literature on budget reform has been divided into two camps. On one side are reformers who advocate procedures and techniques that they see as moving budgetary decision-making toward rational economics-based logic. Standing against reformers are pragmatists who argue in the words of former Alabama Governor James E. Folsom, Sr.: "You can't take the politics out of politics." Applied to budget reform, Folsom's dictum means that any

attempt to distance budgeting from politics merely changes the venue of politics from one location such as the legislature to another place such as unelected budget analysts working for the chief executive. Judgments regarding the amounts that should be spent on battleships, education, and thousands of other expenditures are inherently value laden, interest based, and unquantifiable. It is the job of the executive and legislative branches to balance these political forces to formulate budgets. Key [1940, p. 1143] appeared to side with the pragmatists when he suggested that politics constitutes a kind of market place with the resulting budgets reflecting "the social consensus on the relative values of different services." He argued that until reformers answer basic questions about how differences among political interests are to be resolved, mechanical changes in budget procedures will have little effect [p. 1137].

Both pragmatists and economics-based reformers have tended to assume that budgetary politics and policy-making are conducted within the confines of a representative democracy. Pragmatists tend to characterize budgetary politics as a struggle among competing interest groups in the executive and legislative branches. The electorate participates only through their interest group memberships and periodically in elections. The image of budgetary policy-making presented by early economics-based reformers is even narrower in scope: executive branch and to a lesser degree legislative staff use analytical tools to develop policy choices that aid executive branch budget formulation and legislative budgetary decision-making. To some degree, reformers see analysis as counter-balancing the influence of raw politics.

24.2.2 Jeffersonian Budgeting

In recent years, a new influence that emphasizes the need for broad participation in budgeting has appeared especially in state and local governments. It was accelerated or intensified by the financial crises experienced by state governments and many local governments following the 9/11 attacks and the subsequent economic downturn together with widely publicized private sector accounting dishonesty. The movement toward broad participation has been reinforced by the failure of public and private sector financial institutions in 2008. It has been greatly facilitated by the widespread use of the Internet.

Only a few years ago, finding a state budget required considerable effort. Now most jurisdictions make at least summaries of their budgets available on the Internet. Citizens and the news media interested in how tax dollars are being spent or why services are being cut and taxes increased can locate a great deal of information with little effort. However, most of these documents are still difficult to interpret and often presented in ways designed to sell an administration's package rather than truly inform. In the private sector, corporate stockholders victimized by deceptive accounting practices also are asking questions and demanding clear answers [Brown 2005]. What citizens and stockholders both require is often called transparency [Phillips and Abey 2007]. They want to be able to read, understand, and trust financial statements and be able to understand the logic behind decisions made. All of this is consistent with the democratic, Jeffersonian standard of a well informed electorate. We call it Jeffersonian budgeting, and a New England town meeting version is sometimes called participatory budgeting [Baiocchi and Lerner 2007].

24.3 Waves of Economics-Based Reforms

Economics-based budget reforms have appeared in waves, and elements of these reforms remain in budgeting processes with local, state, and federal governments keeping various elements in great

variety based on their needs and experience. Each wave has taught lessons about what works and what does not, including a great deal about the limits and opportunities afforded by economics-based reforms as well as how these reforms can be enhanced by contemporary computer tools. To absorb these lessons, we must understand the reasons why each set of reforms was introduced and how well each worked.

24.3.1 Classical Performance Budgeting: The First Wave of Economics-Based Budget Reforms

The first reform wave matured in the 1950s [Schick 1966; U.S. Commission on Organization of the Executive Branch of the Government 1949]. It was called performance budgeting, not to be confused with the current approach of the same name. To maintain the distinction, we refer to the 1950s version as classical performance budgeting. Classical performance budgeting focuses on costs of discrete governmental activities such as training, regulation, highway construction, research, refuse collection, and executive direction [Wanat 1978; Schick 1966; Lee, Johnson, and Joyce 2004]. It consists of two basic parts: cost analyses of activities and forecasts of amounts of those activities that will be needed in the next fiscal year. The budget is generated by multiplying the cost of each unit of an activity adjusted for inflation by forecasts of the number of units required in the next fiscal year and then totaling these projected costs for each activity.

Classical performance budgeting was used for a number of years by the state universities of Indiana. University budget analysts saw teaching as the central activity of the institution. Teaching was divided into courses, and the cost of conducting each course calculated. The largest cost of each course was the percentage of an instructor's salary apportioned to the course. Added to the instructor's salary were administrative costs, library costs (derived by studies of library usage generated by various kinds of courses), heating, and the like [Grafton 1970]. Once the cost of each course was calculated, the number of each course to be taught in the next biennium (Indiana's budget was biennial) was estimated [McKeown 1989; Center for State Higher Education Policy 1991]. By multiplying the cost of each course by the estimated number of offerings and adding the result, a large portion of the institutional budget could be derived. Initially, this process was done manually, but it was later computerized.

Ideally, managers are primarily concerned with implementing policy efficiently and effectively [Burns and Lee 2004, p. 5]. In general terms, efficiency is the ratio of useful energy delivered by a system (output) to the energy supplied to it (input). For government, the result is a ratio of a service delivery measure to all costs related to producing the service. Internal agency cost data can make a valuable contribution to decisions regarding efficiency. However, internal agency cost data by themselves provide little assistance to answering questions about effectiveness, that is, the questions posed by Key. In particular, cost data say nothing about whether an activity whose cost is being measured is worth while. The state universities of Indiana could precisely measure the costs of a class on basketball coaching and a doctoral level chemistry seminar, but the relative merits of the two offerings were not assessed. However, if cost data are combined with information about the benefits that an activity yields, the cost data can help policy-makers select activities that yield the greatest benefit for the lowest cost; this technique is called benefit-cost analysis.

Classical performance budgeting can reduce conflict at the policy making level. It was introduced in Indiana when struggles among the state universities became so intense that legislators and governors became annoyed. Using classical performance budgeting, a large portion of the university budgets was generated more or less automatically, and conflict among the universities drastically reduced. Today, some state university coordinating boards prepare budget submissions using

similar but usually less refined classical performance budgeting techniques. Typically, instead of determining costs for each individual course, the costs of producing credit hours are calculated. Classical performance budgeting remains an important part of executive and even legislative budgeting when combined with subsequent reforms.

24.3.2 Program Budgeting: The Second Wave of Economics-Based Budget Reforms

The second wave of economics-based budget reforms grew partly out of the realization that classical performance budgeting failed to address the effectiveness of government activities. These reforms, associated with the 1960s and Presidents John F. Kennedy and Lyndon B. Johnson, are known as: program budgeting; Planning, Programming, and Budgeting (PPB); or Planning, Programming, and Budgeting Systems (PPBS). Benefit-cost analysis is usually considered an essential part of the second wave of reforms.

Where classical performance budgeting focuses exclusively on internal government activities, such as teaching a class or sorting mail, program budgeting and related techniques concentrate on government outputs and outcomes (see Figure 24.1). For example, in the case of university budgeting, the emphasis shifts from the cost of offering a course to the merits of a course or more importantly the relative merits of all courses and of different ways of offering courses (e.g., community colleges versus universities versus online for the first two years of study), and the possibility that some students might be better off in technical-vocational institutions or not participating in post secondary education at all. In other words, program budgeting is intended to address elements of the Key question [Dugan and Hernon 2002].

Program budgeting identifies governmental activities (outputs) carried on to serve specific clients. Axelrod [1995, p. 40–41] provides the example of meat inspection performed by the state of Wisconsin. The output might be the number of diseased or spoiled carcasses discovered. The outcome, result, or impact of the work could be measured by numbers of cases of illness caused by tainted meat. An indication of effective inspection work would be zero cases of meat borne illness. Classical performance budgeting statistics would be the number of carcasses inspected by each employee and the average cost of each inspection. Such a statistic reveals nothing about the quality of work done or the effect of inspections on public health [Brown and Pyers 1988, p. 736], but it is useful in comparing ways of inspecting meat or of providing improved meat prior to the inspection stage.

In program budgeting and later budgeting reforms, agency activities and outputs are not always distinguishable. Activities and outputs are different and distinct if the activities and the measures of the activities do not directly impact clients (e.g., number of meat inspections). What directly impacts meat consumers is the number of diseased or spoiled carcasses discovered and kept off the market. With the example of university courses the distinction between activities and outputs is less clear. Individual university courses, the central activity of universities, directly impact students. The focus of classical performance budgeting is the cost of each class while program budgeting centers on the quality of classes and alternative ways of delivering classes to students. However, the tendency of program budgeting and later budgeting reforms was to treat agency activities and outputs as one and the same.

In the terminology of program budgeting, activities or outputs are sometimes called program elements. A program is a collection of related activities or program elements. Thus, in Axelrod's example, meat inspection is part of an activity or program element called food inspection, which, in turn, is part of a program called food and trade regulation, which, in turn, is part of a function called agriculture. Functions, programs, subprograms, and activities or program elements form a

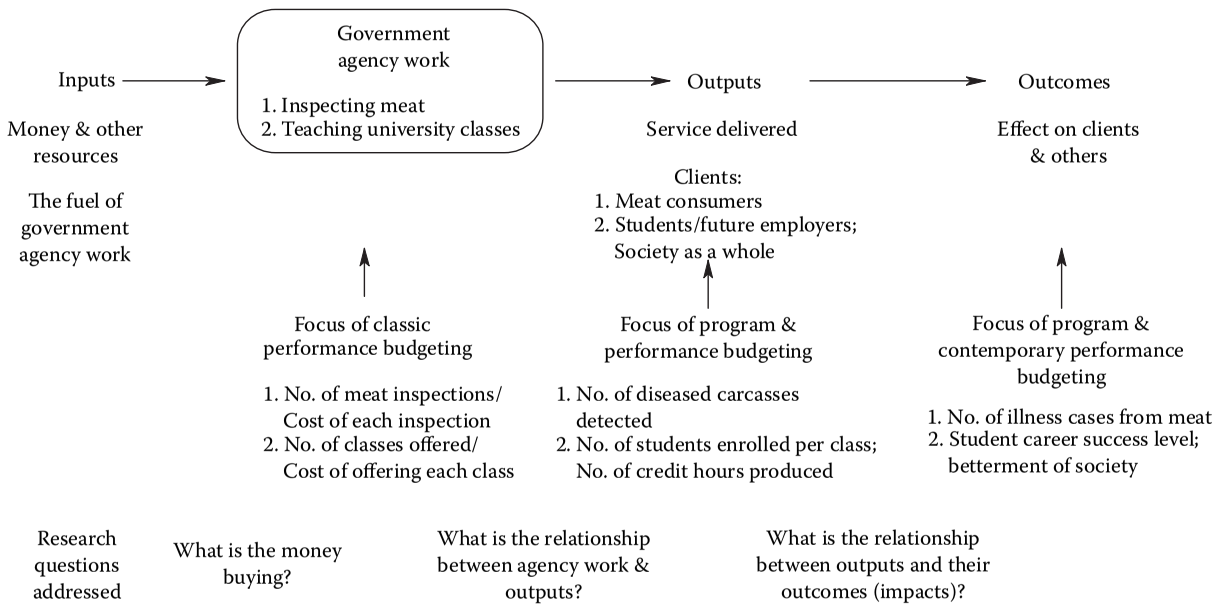


Figure 24.1 Budgeting and budget reform critical connections.

pyramidal structure. State government as a whole might be divided among a dozen or so functions with each function divided among a dozen programs, each program into a dozen subprograms, and each subprogram into a dozen activities or program elements. In this example, there would be 12 * 12 * 12 * 12 or 20,736 activity/program elements. The pyramid of functions, programs, subprograms, and activities is called a program structure.

When budget reformers began thinking about determining the costs of related government activities, they determined that existing budget formats—the way budgetary words and figures are organized—were not adequate [Novick 1954]. Those words and figures can be arrayed in infinitely varied ways. In the 1950s, virtually all government budgets were structured by organizational unit using the line item or object of expenditure format, the oldest and simplest budget format. The line item budget's primary purpose is expenditure control. Its expenditure categories represent what can be thought of as the fuel or inputs of government, not the outputs or activities [McNab and Melese 2003, p. 76–77]. Table 24.1 shows an example for a state agency called Management Services. This agency is engaged in a number of activities, but the budget format makes it impossible to determine how much is being spent on each. And it is likely that other agencies are performing similar activities making cost analysis even more difficult.

Many students of budgeting agree with McNab and Melese [2003, p. 77] that a sole reliance on the line-item budget results in the mis-allocation of resources by focusing attention on "statutory requirements, administrative procedures, and institutional structures" rather than programmatic objectives. In addition, as the example above shows, the line-item budget makes it difficult to determine how much funding is devoted to what purpose. Making matters worse, the line-item budget establishes what McNab and Melese [2003, p. 77] describe as perverse incentives among which is the well known use it or lose it phenomenon (spend it all). Finally, the line-item format is widely viewed as encouraging thoughtless incrementalism and political horse trading.

Program budgeting as it was formulated in the 1960s was extraordinarily ambitious. The program structure was supposed to be arranged by activities performed for particular purposes usually for specific groups or clients. If the group in question was, for example, children, the programs might be scattered throughout a state government and administered by agencies concerned with such matters as education, welfare, health, and criminal justice. These kinds of administrative divisions were to be of no importance in the program budget. This format was meant to span organizational lines to determine how much was being spent throughout government on related outputs of government [Novick 1972; 2002; Sallack and Allen 1987, p. 39]. At the state level, we

Table 24.1 Line-Item Budget Example

Component Expenditures	*FY 2007 Actual (in thousands)*	*FY 2008 Authorized (in thousands)*	*FY 2009 Governor (in thousands)*
Personal Services	2,114.0	2,350.2	2,585.9
Travel	19.7	32.2	32.2
Contractual	448.4	312.2	312.2
Supplies	40.1	44.6	44.6
Equipment	62.5	35.0	35.0
Expenditure Totals	2,684.7	2,774.2	3,009.9

Source: Office of Management and Budget, Program assessment rating tool, Guidance No. 2008-01, 1/29/2008.

have observed few instances of this original pure form of program budgeting. Most state budgets are still arranged organizationally. One reason is the sizeable amount of time, effort, and expense required to produce a function based budget.

The sheer enormity of a program budget is just the beginning of its disadvantages. There is no single system for dividing government work into functional and programmatic categories [Grafton and Permaloff 2000, p. 434–439]. To a substantial degree, the categories are arbitrary, and they might easily be changed from one governor or president, mayor, or county commission to the next making over-time comparisons problematic [Bourdeaux 2006].

The State of Hawaii budget is the purest example of program budgeting we have seen. The Hawaii, governmental organizational structure is substantially different from the budget program structure [Hawaii Department of Budget and Finance 2007]. Like most states, Hawaii's highest organizational division consists of departments with titles such as Education, Health, Human Resources Development, and Human Services. There are 20 in all including the University of Hawaii, which is listed as the equivalent of a department. At its highest level, Hawaii's program structure consists of 11 "Level I" programs (what Axelrod [1995] calls functions): Economic Development; Employment; Transportation Facilities; Environmental Protection; Health; Social Services; Formal Education; Culture and Recreation; Public Safety; Individual Rights; and Government-wide Support. Each Level I program is divided into a number of Level II programs and each Level II program into several Level III programs, and so forth. The maximum is five levels.

For illustrative purposes we select Economic Development, a Level I program. Its objective is to facilitate economic growth. Various segments of this program are operated by the departments of Agriculture, Business, Economic Development and Tourism, and Land and Natural Resources. Having a program run by several organizational entities is a hallmark of program budgeting in its original form.

The budget for 2007–2009 lists six "measures of effectiveness/activity" of the Economic Development Program including the gross state product, personal income, and the unemployment rate. Considering that these indicators are influenced by many variables over which the state has no control, it is unclear what light they shed on program performance.

Economic Development contains eight Level II programs: Business Development, Tourism, Agriculture, Fisheries and Resource Enhancement, Technology, Water and Land Development, Special Community Development, and the Hawaii Housing Finance and Development Corporation. The objective of the Business Development program (to take one example) is to: "facilitate growth, diversification, and long-term stability of the State's economy by promoting exports of Hawaii's products and services and attracting business and investment" [Hawaii Department of Budget and Finance 2007, Economic Development, p. 1–5]. The budget's measures of effectiveness/activity for the Business Development program consist of percent annual increase in gross state product and number of new jobs created per year. Again, many factors beside the Business Development program affect these variables.

Business Development contains four Level III programs: Strategic Marketing and Support, Creative Industries Division, Foreign Trade Zone, and General Support for Economic Development. As an example, the Strategic Marketing and Support program attempts to attract new businesses and increase exports of Hawaiian products. Its three Level IV programs are: Service Trade, Investment and Business Analysis, and Business and Community Assistance. The Service Trade program seeks to increase exportation of professional services in industries such as health care, education, architecture, and engineering.

The state budget for all programs contains, among other information, program objectives, a description of activities performed, a statement of key policies pursued, and a list of other programs

to which the program being described is related. In addition, the budget for each program contains output and outcome indicators.

Considering that program budgeting is intended to minimize the impact of politics on budgeting, it seems peculiar that in a description of the Hawaiian budgetary process Sakaguchi [2000] placed an almost exclusive emphasis on politics, which he saw evident in debates over continuation of an economic stimulus policy, government personnel salary increases, education reform, and drug abuse problems. He stressed how these matters would affect a potential Republican Party takeover of the House of Representatives and the fortunes of the first Republican governor in four decades. Hawaii's sophisticated program structure, together with its performance indicators, are conspicuous by their absence in both Sakaguchi's description and newspaper coverage of the state's budgetary situation [e.g., Alexander 2003]. More recently, the Hawaii House Blog [2008a] concentrated entirely on revenue constraints, not the allocation of resources among programs based on benefit-cost considerations, and focused on appropriations for charter schools and a reserve fund for Temporary Assistance for Needy Families [Hawaii House Blog 2008b]. Program budgeting was not mentioned.

The 2005 Government Performance Project (GPP) co-sponsored by *Governing* magazine and the Pew Foundation graded the state of Hawaii as a C. It reported that:

> . . . Hawaii leaves an impression that it relies on performance measurements and other information to create its budget. It was one of the first states in the nation to pass legislation mandating such an effort. In reality, the use of serious information to actually manage or budget in Hawaii is about as rare as a blizzard in Honolulu. . . . Hawaii has no statewide strategic plan, and although some agencies do a certain level of planning, the measures produced to track performance can be inconsistent and less than meaningful. [GPP 2005, par. 4]

While the report credited the State Auditor's Office with doing performance audits since 1965, it noted that only three had been done in the previous year and "although the legislature pays some attention, the agencies seem rather resistant to this source of advice" [par. 5]. Three years later little had improved. The GPP [2008a, pars. 1–2] assigned the grade of C+ to the Hawaii state government, and its system of budgeting (graded "mid-level") appeared to be a major reason.

Like Hawaii's program structure, the State of Pennsylvania's original PPBS system was independent of organizational lines. The bottom of the structure consisted of activities with associated costs, but according to Sallack and Allen [1987, p. 42], this arrangement:

> . . . was overly ambitious, and overestimated the capacity of both the executive and legislative branches to devise and manage the date (sic) presented by the system. . . . the state government found it difficult to develop the technology in management information and accounting systems to maintain and administer PPBS.

Making matters worse, with program categories scattered over multiple agencies (precisely the situation for which PPBS was designed), it was impossible to assign accountability to any one agency for the success or failure of a program (p. 43). In addition, the program budget was often a source of confusion in legislative hearings (p. 43). [Also see Mosher 1969.]

Pennsylvania redesigned its program structure so that each program was the responsibility of a single agency. As a consequence of this change the state lost its ability to perform "cross-agency analysis concerning program activity" [Sallack and Allen 1987, p. 47]. Most other practitioners

of program budgeting have either shifted back to an organizational focus or adopted program structures that adhere to organizational constraints [Bourdeaux 2008, p. 21]. Despite the general retreat from all-encompassing government wide program budgeting, many program budgeting concepts remain part of contemporary budget reform as we will see below.

24.3.2.1 Program Budgeting and the Relationships between Activities, Outputs, and Outcomes

Arguably even more difficult than establishing a program structure geared to government activities but free of a government's organizational structure is understanding the relationships between activities and outputs and between outputs and outcomes. Grasping the nature of these relationships continues to be perhaps the central problem for contemporary budget reformers. Determining the cost of activities (the realm of the original performance budgeting) is relatively simple, but moving to outputs and (even more difficult) outcomes is not. Again, referring to Figure 24.1, assuming that inspecting every carcass is impossible because of cost, what sampling techniques insure that diseased carcasses will be found within an acceptable level of risk? Are there alternative techniques (e.g., irradiation) that can more effectively reduce the number of diseased carcasses before inspection? What is the relationship between the number of diseased carcasses discovered and the number of cases of meat-borne illnesses? Answering these questions requires effort, time, and expense, and as the irradiation example suggests, new technologies can change established answers and may also generate new political issues that affect the budgetary process.

Turning to higher education, the other example in Figure 24.1, what combinations of courses in what mixtures of institutions (e.g., community colleges or four year universities) are best for students? In this context, what does "best" mean? How are course quality and the best mixture of courses to be determined or even defined? Here the clients are those who potentially benefit from the work of university graduates not just students themselves. Shifting to outcomes, how do we measure the effects of courses on students, student career success (which occurs years after graduation), and the betterment of society (however that may be defined)? Unlike the meat inspection example, all of these questions are difficult to define let alone measure.

Professional organizations associated with budgeting began pushing for outcomes (as opposed to outputs) measurement in the 1990s [Governmental Accounting Standards Board (GASB) 1994; 2002; National Advisory Council on State and Local Budgeting 1998; McTigue 2004, 5]. GASB and others distinguish between two kinds of outcome measures: end outcomes (what we have been calling simply outcomes) and intermediate outcomes. The meaning of end outcomes is difficult to evaluate because so many extraneous variables may affect them. Often the best that can be done is to use intermediate outcomes, which may look much like what we have been calling outputs. It is often not clear whether a given indicator measures an end outcome, intermediate outcome, or output. The difficulty of distinguishing among them is illustrated by Ho and Ni's [2005, p. 67] attempt at carefully defining them. For example, the number of individuals who successfully complete a non-mandatory program may be treated as an intermediate outcome. However, merely reporting the number of participants can be treated as an output measurement since it does not indicate any result or completion of the program. We would add that with some programs this point may be a distinction without a difference because many voluntary or compulsory programs such as continuing education courses report successful completion even if all an individual has done is attend. Virtually every example measure that Ho and Ni [2005] introduce could be treated either as an output or intermediate outcome or an intermediate outcome or end outcome.

Even if it is possible to measure the effect of a particular set of government activities on outputs and the effect of outputs on outcomes, it is often difficult to attach a dollar value to the outcomes. For example, how much is it worth to meat consumers and taxpayers to ensure 100% certainty that no one will become even mildly ill because of bad meat?

Making matters even more complex, a central question in budgeting is not just what benefits are created at a given cost, but what effect changes in funding will have on output levels and after that benefits? There is no way to determine the relationship between funding levels and outcome benefits without time consuming and expensive empirical research. Despite these methodological barriers, contemporary budget reformers are calling for increased use of outcome measures.

Answering the Key question essentially requires that an entire government budget be subjected to an enormous set of benefit-cost analyses. In addition to the complications discussed above, to be fully useable, benefit-cost analysis requires that all benefits (and costs) be rendered as dollars. In the case of meat inspection, that would mean attaching a dollar value to lives and to the pain suffered from fatal and nonfatal cases of food poisoning. Because many government programs have lives saved as benefits, there is a substantial literature on how lives are valued in dollars, but there is widespread disagreement within that literature [e.g., Boardman, Greenberg, Vining, and Weimer 2001; Nas 1996; Schmid 1989]. A thorough benefit-cost analysis would probably require the use of several life-valuation methods to determine whether the analysis is sensitive to these differing approaches [Nas 1996, p. 107–109].

Answering the Key question throughout a government's budget (federal, state, or local) requires much more than deciding on optimal funding levels for each individual activity. The heart of budgeting is making choices among funding levels for many different activities: prison systems, universities, primary and secondary schools, traffic control, highway construction, and so forth. In theory, this would require analysts to determine in dollars the benefits to society of each activity and the marginal benefits to society of marginal funding for each activity or the marginal negative benefits to society of reductions in funding. Such a government-wide analysis is impossible even in theory if only because of the benefit valuation problem.

The best that program budgeting can do is to generate cost data (using original performance budgeting cost analysis) that sheds light on the intuitive judgments that the chief executive and lawmakers are obliged to make, and to permit citizens in the tradition of Jeffersonian governance to know how their tax dollars are being spent.

24.3.2.2 The Impact of Program Budgeting

Has program budgeting made a difference? Would dollars be distributed differently with and without a program budget? It is probably impossible to make this case statistically, and we know of no one who has. We are essentially asking what would have happened if a state or locality that switched to program budgeting had stayed with traditional pragmatic budgeting using an organization-based line item format. The impact of other factors such as an election or a major economic change immediately before or after the introduction of the new budgeting system could swamp the effect of a new budget format. In addition, new budgeting approaches are often phased in over a period of years or characterized by a long break-in period where many modifications occur; the difference between the end of the old system and the complete installation of the new may be half a decade or more. This long phase-in or break-in period allows the political and economic environments to play even larger roles than might be the case if there were a sharp break between old and new. The impact of program budgeting will probably never be measured by differences in spending before and after reform.

A less rigorous standard requires only that a budget reform merely alter approaches to decision-making. This is a more manageable problem methodologically. Pettijohn and Grizzle [1997] examined U.S. House Appropriations Committee subcommittee hearings for five federal agencies to detect the effect of budget formats on decision-making. Limiting their time frame to 1949–1984, a period that saw the introduction of classical performance budgeting and PPBS, they analyzed the hearings in terms of the types of questions asked. They found that following the introduction of classical performance budgeting there was an 8.0% increase in programmatic themes and an 8.3% drop in line item expenditure themes [p. 35]. PPBS had an even larger impact: an 18.4% increase in programmatic themes and a 13.6% reduction in line-item themes [p. 34].

Similarly, Sallack and Allen [1987] concluded that while Pennsylvania's modified, limited PPBS system moved far from its idealistic beginnings, it represented a marked improvement over the purely political budgeting that predated PPBS. And while a modified, limited PPBS such as Pennsylvania's fails to answer the Key question, it might go a long way toward informing citizens and the media who would bring their own values to bear on questions regarding the dollar worth of particular government activities [Bourdeaux 2008, p. 22–24].

24.3.3 Restructuring Budgets to Better Align Resources with Performance

Writing in 1971 Merewitz and Sosnick [p. 22] objected to the complications, of the sort discussed above, generated by program categories being independent of organizational structure. Their solution was not a burdensome program budget, but rather reorganization with government agencies structured by function. If this were done, a line-item budget would be a program budget. They made this point to highlight weaknesses of program budgeting. They did not anticipate widespread organizational restructuring to achieve budget rationalization.

In 2001, the federal Office of Management and Budget (OMB) and the Government Accountability Office (GAO) attempted to bring about a renaissance in program budgeting called budget restructuring. Congressional appropriations bills contain many spending categories called accounts, and virtually all accounts include a number of programs. The GAO [2005b, p. 3] criticized the fragmented account structure as inconsistent with performance goals. In addition, the account structure makes program cost analysis difficult. GAO administrator Paul L. Posner [2003, p. 15] noted: "The general lack of integration between these structures can hamper the ability of agencies to establish and demonstrate the linkage between budget decisions and performance goals."

According to the GAO [2005b, p. 6]:

> Given the multiplicity of budgetary actors in our system, any budget restructuring effort represents more than structural or technical changes. It reflects important trade-offs among different and valid perspectives and needs of these different decision makers. … changes to the account structure have the potential to change the nature of management and oversight and ultimately the relationship among the primary budget decision makers–Congress, OMB, and agencies.

The OMB and GAO tried to bring about budget restructuring, but there is no evidence that they succeeded beyond a few experiments in individual agencies, and the GAO appears to have abandoned budget restructuring as a lost cause.

24.3.4 Contemporary Performance Budgeting

Beginning roughly in the late 1980s, a new generation of economics-based reformers introduced loosely related techniques variously labeled performance budgeting, Performance Based Budgeting, PBB, or program-based performance budgeting. Benchmarking and scorecarding are related terms that focus on performance measures for a variety of managerial purposes including budgeting [Ammons 1999; Lawson, Stratton, and Hatch 2007]. The overlap between some of these terms with those used in the 1950s leads us to label these newer techniques contemporary performance budgeting to avoid confusion.

In general, contemporary performance budgeting refers to the inclusion of output and outcome measures in the budget. This broad definition includes many program budgeting systems especially ones like Hawaii's. Jordan and Hackbart [1999] distinguish between performance *budgeting* (defined as we have just done) and performance *funding* by which they mean that decisions regarding allocation of dollars are "contingent upon" performance measures. Ideally, contemporary performance budgeting identifies activities (outputs), studies the effect they are having (outcomes), and links outputs, outcomes, and funding decisions [Robinson and Brumby 2005, p. 15; McTigue 2004, p. 4]. As we saw earlier, making these connections is also an objective of program budgeting. The relationships illustrated in Figure 24.1 apply as much to contemporary performance budgeting as they do to program budgeting. In practice, the difference between the two budgeting reforms is one of emphasis. Program budgeting stresses program structure whereas contemporary performance budgeting concentrates on indicators, and those indicators can be used even in a budget that adheres to the government's organization structure.

Many local and state governments and the federal government include performance measures in their budgets, but in most cases, there is little evidence that the presence of the measures is anything but decorative. The reader needs only to examine budgets, news media coverage of budgetary politics, and scholarly studies of performance budgeting on the Internet to determine the validity of this observation. Our earlier discussion of Hawaii's failure to use its extensive system of performance indicators is another example.

Jordan and Hackbart's term performance funding seeks to rule out the use of performance measures for ornamentation, but their phrase "contingent upon" is broad and could include the possibility that factors other than performance influence budgetary decisions. Other writers distinguish between the use of performance measures for executive branch management (with no direct impact on the budget) and budgeting [Robinson and Brumby 2005, p. 30–32].

The introduction of contemporary performance budgeting is usually credited to the GASB. The trend toward performance budgeting was endorsed by the U.S. Congress with the passage of the Government Performance and Results Act of 1993 (P. L. 103-62), which requires federal agencies to develop multiyear and annual performance-based plans, formulate performance indicators, and link performance to budgets [McNab and Melese 2003, p. 83]. Since then more than half of the states have enacted similar laws, and the use of performance indicators has also become popular in localities [Melkers and Willoughby 2004; 1998]. Neither GASB nor Congress attempted to link performance budgeting to a program structure; however, performance budgeting can adapt to a program structure and is probably better for it [Robinson and Brumby 2005, p. 7].

Schedler [1994, p. 44] lists four basic requirements for an effective performance measurement: "(1) objectives must be clear, measurable, and consistent; (2) performance of the administration must be unambiguously defined and measured; (3) costs of production must be able to be determined; and (4) access to information must be available at any time." Schedler delineates some of the problems associated with each of his requirements.

First, he emphasizes that objectives are not likely to be universally agreed to in a democracy. Establishing objectives is the realm of the political process in the legislature. We saw earlier that Posner [2003, 2, p. 14–15] reinforces Schedler's emphasis on the importance of clear objectives as well as a budget structure consistent with those objectives.

In elaborating on his second requirement, Schedler asserts the primacy of the politics-administration dichotomy, a concept developed by Wilson [1941] in 1887. Wilson, observing public administration choked by Jacksonian Spoils politics, suggested that administration should be devoted to the efficient implementation of public policy (developed through the political process in the legislature) without political interference. Wilson's politics-administration dichotomy is a key part of the intellectual foundation of scientific public administration and to some degree economics-based budget reforms. The process of defining and measuring performance, according to Schedler's experience in Switzerland, should be under the complete control of the executive. The budget including performance data is then submitted to the legislature. The legislature should approve the budget or amend it only by modifying activities and goals, not by changing the budget directly. Increases or reductions in spending are consequences of legislative modifications in what government will be doing [Schedler 1994, p. 45].

Schedler's description of the formulation of and reliance on performance measures fails to mirror the realities of American politics. For example, in developing its performance measurement system the state of Louisiana witnessed disagreement among governor's budget office personnel, executive line administrators, and legislators about the content of long and short term plans and what performance indicators should be used [Epstein and Campbell 2002, p. 30]. The same point was made in an interview Grafton and Permaloff [1996] conducted with a State of Illinois governor's budget staff person engaged in trying to install performance measures in a few agencies on a trial basis. She characterized the conflict over the formulation of performance measures as traditional budgetary politics situated in a new arena. Instead of fighting directly over the distribution of dollars, agency personnel battled over indicators that would influence the distribution of funds many years in the future. More than a decade later in Illinois intense executive-legislative battles have not improved the state's budgetary situation [GPP 2008b]. Similarly, Grizzle and Pettijohn [2002, p. 55] describe conflict among Florida legislators and between legislators and their committee staffs that encouraged executive branch agencies: "to provide the legislature with lots of measures for each program, in the hope there will be something in the measurement set that each of the legislative committees will find acceptable." This practice renders problematic the connection between performance and budget incentives or disincentives.

Bourdeaux's [2006] description of a budget reform instituted in 2003 in Georgia is consistent with other reports of legislative decision-making after budget reform are instituted. The reform, a mixture of Governor Jimmy Carter's zero-based budgeting, program budgeting, and performance budgeting, was initiated, as such reforms nearly always are, by the chief executive and affected budget formulation in the executive branch, but not the legislature [p. 120–121]. Few members of the Georgia Senate Appropriations Committee were aware of the new system or used it to aid their decision making [p. 120]. Bourdeaux observes that the Georgia Senate was typical of other legislative bodies in using budgetary data less that the executive branch. She hints that budget reforms sometimes die of neglect in legislatures [p. 125].

Behn [1999, p. 2] suggests that piling on measures to please everyone is not unique to Florida with his observation that "performance measures are often a hodgepodge collection." The GAO [2005a, p. 4] echoes Behn in its description of many state attempts at performance budgeting where there is often disagreement among participants regarding the selection of measures. Furthermore, large quantities of performance data render those data relatively valueless.

Schedler [1994] asserts that a system of cost accounting is an absolute requirement for effective performance measurement because performance cannot be evaluated without knowing how much it costs. Here we return full circle to classical performance budgeting. Posner [2003, p. 10] agrees that accurate cost data are critical but adds that most federal agencies cannot supply program cost information.

For Schedler [1994, p. 47] performance budgeting information must be clearly understandable and widely available: "The adequacy and accessibility of information is influenced by the appropriate selection of information parameters, appropriateness of density relative to user capability and need, and by its truth and clarity. The citizen does not want 'data cemeteries' but annual statements that are intelligibly formulated and even clearly illustrated." Here Schedler touches on the Jeffersonian theme central to contemporary performance budgeting. In 1987 GASB listed three "primary users" of performance budgets: citizens, legislators, and creditors [Brown and Pyers 1988, p. 736]. We have yet to see a budget at any level of government that could be characterized as accessible except to sophisticated users such as veteran legislators and a few news reporters and lobbyists.

Perhaps the most intractable problem of both performance and program budgeting is that neither contains standards by which sanctions are applied. If a program is operated inefficiently or ineffectively, should funding be reduced thus perhaps crippling the program? Or should program administrators be removed? If the inefficient or ineffective program is given a funding increase, is it being granted a license to continue its wayward operation? Similarly, if a program is operated efficiently and effectively, should it be rewarded with funding increases? If so, will the additional funding also be spent efficiently and effectively? Or should an efficient and effective program be reduced since it is capable of making the most of scarce resources? [Schedler 1994, p. 44] Robinson and Brumby [2005, p. 11, 46] observe that financial incentives are a significant unresolved issue in the field of budgeting.

Another problem is that governments often begin performance measurement using available software but experience difficulty integrating the resulting data into management systems and forms accessible to the public. The solution, according to Lawson, Stratton, and Hatch [2007], is enterprise-wide software capable of accepting performance data into the management information system as a whole.

24.3.4.1 Contemporary Performance Budgeting at the Federal Level

Courty and Marschke [2003] examined the use of performance indicators to create an incentive system in a U.S. Department of Labor (DOL) program created by the Job Training Partnership Act (JTPA) of 1982. JTPA work was performed by local job training centers whose staff employed considerable discretion over enrollment decisions and training methods. The training centers received funding partly based on performance.

The DOL employed four performance measures two of which were the fraction of participants who left the program with jobs and their average wage. The states formulated rules for allocating incentive funds. They differed in four major ways. First, states weighted the performance measures differently. Second, some states scaled awards to the size of training centers while other states operated on a winner-take-all basis. Third, states varied in the degree to which training center performance rankings governed awards. Fourth, awards differed based on performance above established standards. These differences had the potential to affect performance, but measuring the impact of these differences was problematic because local conditions varied widely. Courty and Marschke [2003, p. 47] concluded that the experience with this program illustrates the difficulty

of developing performance measures and incentives consistent with program objectives. For example, by focusing on numbers employed when training was complete, training centers were motivated to increase employment at the expense of salary levels. [See also Heinrich 2002.] However, according to the authors, the decentralization that Congress built into the program encouraged experimentation that led to a balance of measures and incentives designed to bring about desired outcomes [p. 48].

The OMB's Program Assessment Rating Tool (PART) is a major element of the federal government's attempt to move toward performance funding and operates with the overall framework of the Government Performance and Results Act. PART was first applied in the FY 2004 budget. By January 2008, the OMB had analyzed 98% of federal programs using PART (ExpectMore.gov).

PART is structured as a questionnaire divided into four weighted sections: program purpose and design (20%); strategic planning (10%); program management (20%); and results (50%). Each section is scored as: effective (85–100 points); moderately effective (70–84); adequate (50–69); or ineffective (0–49). If OMB analysts regard performance data as inadequate, a "results not demonstrated" rating is assigned [OMB 2008]. PART's core consists of the 25 questions found in Table 24.2. The questions apply to all programs with additional questions applied to some specialized programs. Answers to PART questions are derived from collaboration between the OMB examiner responsible for a given program and his or her counterparts in the agency.

At first glance, PART, with its simplistic looking ratings, would not appear to work with performance budgeting given its heavy emphasis on quantitative indicators [Posner 2004, p. 7]. The first question in Table 24.2 asks whether a program's purpose is clear. This question is often the subject of controversy in any organization. The second question asks whether the program has ambitious targets and time frames for its long-term measures. How is ambitious to be defined? One person may view measures as ambitious while another may see them as reckless and still another as overly cautious. The remainder of the PART questions can be dismantled in a similar manner. This apparent lack of clarity would seem to invite inconsistency in PART scoring [Posner 2004, p. 8; Frisco and Stalebrink 2008, p. 3].

PART's question format and the many criticisms that have been leveled at it should not obscure the fact that performance statistics lurk within. For example, we examined the Department of Agriculture's On-Going Pest and Disease Management Program, which was assessed in 2006. Scored by OMB as "effective," this program's objective is to prevent or reduce damage caused by pests and disease, and its "long-term outcome" measure is the value of damage prevented or reduced because of the program (www.whitehouse.gov/omb/expectmore/detail/ 10000030.2002.html). The program has a benefit-cost ratio, which is expressed as the value of damage prevented or reduced per dollar spent. In 2006, the ratio was 1.12, and in 2007 it was 3.22, meaning that for each dollar spent the program realized an estimated $1.12 in 2006 and $3.22 in 2007. The 2007 figure suggests the program is an excellent investment.

Other Pest and Disease Management Program outcome measures are the percentage of cotton that is boll weevil free and the number of brucellosis-free states and territories. These and other measures support answers to the PART questions. For example, the response to whether the program is making progress in accomplishing its long-term goals is a 625 word analysis which begins with a review of the program's purpose followed by what appears to be a rigorous and informed analysis of performance data.

We would expect to see a program that has achieved a high OMB rating as this one did to be supported by convincing evidence of its success as this one does. For contrast we examined

Table 24.2 Program Assessment Rating Tool (PART) Questions and Section Weights

Section 1: Program Purpose and Design – 20%
Is the program purpose clear?
Does the program address a specific and existing problem, interest, or need?
Is the program designed so that it is not redundant or duplicative of any other federal, state, local, or private effort?
Is the program design free of major flaws that would limit the program's effectiveness or efficiency?
Is the program design effectively targeted so that resources will address the program's purpose directly and will reach intended beneficiaries?
Section 2: Strategic Planning – 10%
Does the program have a limited number of specific long-term performance measures that focus on outcomes and meaningfully reflect the purpose of the program?
Does the program have ambitious targets and timeframes for its long-term measures?
Does the program have a limited number of specific annual performance measures that can demonstrate progress toward achieving the program's long-term goals?
Does the program have baselines and ambitious targets for its annual measures?
Do all partners (including grantees, sub-grantees, contractors, cost-sharing partners, and other government partners) commit to and work toward the annual and/or long-term goals of the program?
Are independent evaluations of sufficient scope and quality conducted on a regular basis or as needed to support program improvements and evaluate effectiveness and relevance to the problem, interest, or need?
Are budget requests explicitly tied to accomplishment of the annual and long-term performance goals, and are the resource needs presented in a complete and transparent manner in the program's budget?
Has the program taken meaningful steps to correct its strategic planning deficiencies?
Section 3: Program Management – 20%
Does the agency regularly collect timely and credible performance information, including information from key program partners, and use it to manage the program and improve performance?
Are federal managers and program partners (including grantees, subgrantees, contractors, cost-sharing partners, and other government partners) held accountable for cost, schedule and performance results?
Are funds (federal and partners') obligated in a timely manner, spent for the intended purpose, and accurately reported?

continued

Table 24.2 (continued)

Does the program have procedures (e.g., competitive sourcing/cost comparisons, IT improvements, appropriate incentives) to measure and achieve efficiencies and cost effectiveness in program execution?
Does the program collaborate and coordinate effectively with related programs?
Does the program use strong financial management practices?
Has the program taken meaningful steps to address its management deficiencies?
Section 4: Program Results/Accountability – 50%
Has the program demonstrated adequate progress in achieving its long-term performance goals?
Does the program (including program partners) achieve its annual performance goals?
Does the program demonstrate improved efficiencies or cost effectiveness in achieving program goals each year?
Does the performance of this program compare favorably to other programs, including government, private, etc., with similar purpose and goals?
Do independent evaluations of sufficient scope and quality indicate that the program is effective and achieving results?

Source: Office of Management and Budget, Program assessment rating tool, Guidance No. 2008-01, 1/29/2008.

the Advanced Technology Program (APT) administered by the National Institute of Standards and Technology of the Department of Commerce, a program OMB assessed in 2002 and rated as "adequate" (www.whitehouse.gov/omb/expectmore/detail/10000030.2002.html). According to the PART analysis, the program's poor score was due primarily to purpose and design problems caused by a changing environment, not output measurement:

ATP was initially established to address concerns about U.S. competitiveness in the late 1980s and early 1990s. However, one could argue that this concern has lessened in recent years. Studies show that there are many non-governmental entities investing in early-stage technology development, such as corporate research labs, venture capital firms, angel investors, and universities. Given the amounts available from other sources, it is not evident that there is a clear need for federal subsidies for private technology development.

Even though the 2002 PART analysis suggested that the program was ready for the chopping block, it survived into the fiscal year 2007 budget. The America Competes Act of 2007 abolished ATP, replacing it with the Technology Innovation Program (TIP) (www.nist.gov/tip). The "frequently asked questions" section of the TIP Web site takes great pains to stress that TIP is not ATP, but the differences appear inconsequential. Space is lacking for an analysis of the fates of other programs with low PART ratings, but the survival of ATP/TIP is suggestive.

To a considerable degree, PART's weaknesses are due to the fact that no analysis of most government programs can be "objective." It is impossible to eliminate human judgment and values. But, as the analysis of the On-Going Pest and Disease Management Program demonstrates, the answers to

the simplistic looking questions appear to be arrived at using rigorous data and analysis making the human judgment and values as solid as possible. And while the questions are simplistic, Gilmour [2006, p. 12–13] identifies "the inherent reasonableness of the questions" as one of PART's greatest strengths. He notes: "It is hard to argue with an assessment that asks programs to have a clear statement of program purpose, good planning, strong financial management practices, and so on" [p. 13]. We also find that on the transparency side, OMB's ExpectMore Web site provides ready access to the findings.

24.3.4.2 Contemporary Performance Budgeting in the States and Localities

Willoughby and Melkers [2000, p. 12] found that all states have legislation requiring what the authors call performance-based applications or an executive requirement for such applications (33 and 17 states, respectively). However, not all states have government-wide performance systems regardless of how they were mandated. Indeed, Willoughby and Melkers [p. 14] observed that few states have uniform measures of agency performance, and Burns and Lee [2004, p. 6] detect a "backsliding" in the use of performance indicators that they believe began after 1990. Chi, Arnold, and Perkins [2003, p. 441–442] counted only 11 states with statewide applications. Similarly, although performance measurement is common among local governments, relatively few have made performance measurement part of their management system [Kreklow 2006a]. Furthermore, GASB reports that only one-third of the local governments it surveyed found performance measurement to have enhanced performance [Kreklow 2006a].

Despite the relatively low incidence of comprehensive statewide and local performance systems, Willoughby and Melkers [2000] and Melkers, Willoughby, James, Fountain, and Campbell [2002] see progress. For example, performance budgeting is increasingly integrated with strategic planning. Furthermore, advances in computing make it easier to enter, maintain, and communicate performance data [Willoughby and Melkers 2000; Melkers, Willoughby, James, Fountain, and Campbell 2002; Grafton and Permaloff 2005; 2007], but performance measures often are not tied into accounting/budgeting database systems [Melkers, Willoughby, James, Fountain, and Campbell 2002, p. 27].

According to a GAO [2005a, p. 9–10] assessment of five states, performance indicators influence legislative budgetary decision-making. Legislators use indicators to make a variety of decisions, but indicators do not generate automatic budget decisions nor are they designed for that purpose. Interviews with state administrators and legislators indicated that workload and output measures are of greater importance to budgeting than the outcome measures preferred by the professional associations that promote performance budgeting [p. 11]. The utility of workload measures is similar to the original performance budgeting when workload data combined with data on cost per unit of effort could be used to calculate budget figures. The GAO was told that in many states legislators have come to expect workload and output data [p. 11]. Legislators are able to use these data to calculate how an agency's service levels would respond to changes in funding.

One example of state legislative use of performance data arose in Arizona where key legislators wanted to eliminate a program that supplied medication to the mentally ill. The program director responded by describing how many patients were likely to commit crimes and be funneled into hospitals or jails if medications were cut off and documenting that these consequences would cost the state much more than the medication [p. 10].

While performance measures are commonly displayed in state and local budgets and sometimes used, they are also frequently ignored. Willoughby [2004, p. 36] reported widespread

instances of performance measures being disregarded by high level managers and elected officials. In addition, linkages between performance data and accounting information and budgets were often absent [p. 26]. Andrews and Hill [2003] argue that the real problem is that performance measurement is simply being added to existing budgetary system rather than being implement as new and complete systems.

Most budget reformers take as a given that politics is the center of budgetary decision making in the executive and legislative branches; processing the cross pressures of conflicting interests *is* politics. It is also budgeting. Economics-based budget reforms are meant to be used by career budget staff with the hope that their work will inform the chief executive and legislators, but studies document that politics, economics, and personal considerations influence budget analysts [e.g., Willoughby 1993a, 1993b; Willoughby and Finn 1996; Thurmaier 1995; Skok 1980; McCue 1999; Goodman and Clynch 2004]. These factors can be constrained (or encouraged) by the culture of the budget office [Goodman and Clynch 2004].

24.4 Capital Budgeting

There is no precise definition of a capital expenditure, but it is large by the standards of the jurisdiction in question, and its life span is more than a year [Kreklow 2006b, p. 56]. For example, a $250,000 construction project on a small university campus would be a capital expenditure, but in a large hospital, it might not meet the dollar threshold. Capital expenditures are contrasted with operating expenditures, which have been the sole topic of this chapter so far. Operating expenditures cover day-to-day costs such as personnel, office supplies, and utilities. Some years ago, a computer would have been a capital expenditure, but personal computers (PCs) with much greater computing power are now operating expenditures almost everywhere [Pagano and Shock 2007].

Some states and localities have separate operating and capital budgets, but the federal government does not. Even jurisdictions lacking separate operating and capital budgets usually treat capital expenditures differently. Debates regarding the virtue of separate capital budgets have been on-going for decades, but we will not join that discussion because the kind of economics-based decision making that reformers advocate for operating budgets are close to the norm with capital budgets or just capital expenditures without a separate capital budget [Pagano and Shock 2007, p. 16].

The major reason why the economics based reformers' ideal is often a reality with capital expenditures is that the projects under consideration represent by definition large purchases by the standards of the jurisdiction. Furthermore, by their nature capital projects have life spans of a number of years or even decades, and the operation and maintenance of those projects nearly always require operating expenses. For example, a new building will require electricity, heat, and custodial staff, and as the years pass roof repairs will follow. Decision makers faced with these realities are inclined to think about organizational objectives that are to be met by a capital project and alternative ways those objectives can be met (e.g., various construction designs versus renting an existing structure) [Grafton, Permaloff, Osterhoff, Gilbert, and Cox 1991; Kreklow 2006b].

Capital expenditure decisions are the realm of benefit-cost analysis where decision makers formally calculate in dollars the benefits and costs of each alternative including the alternative of doing nothing. The choice with the strongest relationship of benefits to costs is the project to be implemented. The chosen project is normally the one with the highest net benefit, which is the difference between benefits and costs. The fact that capital projects involve costs and benefits extending over a number of years means that discount rate (akin to interest rate) calculations are

also involved. Even if formal benefit-cost analysis is not employed, the magnitude of capital expenditures almost dictates a conscious weighing of alternatives.

If economics based budgeting is so commonly employed in capital budgeting, why is it so rarely used in operating budgeting? One reason may be that capital budgeting decisions are often made regarding projects that do not yet exist. A decision to do nothing in the next fiscal year may not seriously threaten political interests. The same logic applied to a program in an operating budget might suggest that the program could be drastically reduced or eliminated with associated threats to government personnel as well as interest groups. We see hints of this in the PART process with low scoring projects. Grafton and Permaloff [1996] in their study of the use of analysis in governors' budget offices found no instance of benefit-cost analysis being used in the 22 states represented by their interview sample of budget analysts nor in the budgets and budget instructions reviewed for 48 states.

24.5 Lessons Learned

The past six decades of budget reform reveals a number of lessons. First, organizational boundaries almost guarantee that there will be duplication and gaps in budgets. Budget restructuring and reorganization might be able to streamline the convoluted budgets that result from the often disorderly organizational structures of governments, but any status quo is always protected by powerful interests inside and outside government. Second, we are slowly moving closer to understanding some relationships between outputs and outcomes. Virtually every branch of the applied sciences is engaged in this work as are a host of professional organizations that serve as repositories of information that can be used for comparisons among programs in many cities and states. Third, classical performance budgeting's emphasis on cost is absolutely necessary in contemporary performance budgeting. Computerized data systems make determining the cost of activities well within our capabilities, but it is still very difficult for a reporter, legislator, or citizen to determine the cost of any government activity. The use of computers enhances line-item budgeting, classical performance budgeting, program budgeting, and contemporary performance budgeting as well as revenue forecasting [Grafton and Permaloff, 2000, p. 435–437; 2003, p. 194–197; 1985a; 1985b]. Computers make possible the convenient use of pivot tables and analytical techniques such as benefit-cost analysis, regression analysis, interrupted time series analysis, and complex time series analysis [Grafton and Permaloff 2007]. And, of course, the Internet facilitates the dissemination of raw data as well as the results of analysis.

A fourth lesson is that we are no closer to understanding the relative benefits of government activities now than we ever were. Benefits are often difficult to measure, and opinions differ on the relative merits of government activities. This is at the heart of the Key question. Key's question represents the irreducible limit beyond which budget reform cannot go.

Budget reforms have made little measurable difference in the way dollars are apportioned among programs and agencies. However, there is anecdotal evidence that budget reforms have had an impact, and there are clear differences in the ways participants think about budgets under various budgetary regimes. Classical performance budgeting reveals the costs of government activities, and it can diminish conflict. Program budgeting encourages participants to think about the benefits of government activities. Classical performance budgeting combined with program budgeting encourages participants to think about the benefits of government activities compared to their costs. Budget restructuring concentrates on aligning budgets and government activities thus permitting participants to connect government activity costs and benefits to budget categories in a systematic fashion. Contemporary performance budgeting can build on classical performance

budgeting, program budgeting, and budget restructuring by giving chief executives, legislators, the news media, and citizens tools by which they can better understand the impact of government activities on people's lives.

Budget reforms from the 1950s through the 1970s were sometimes oversold with immodest claims of bringing scientific objectivity to an inherently political process. Program budgeting with its attempt to overcome organizational boundaries may represent the peak of ambitious reform. The contemporary performance budgeting literature is more realistic. Contemporary performance budgeting, easily available computer tools, and the Internet are expanding the quantity and sometimes the quality of information available to chief executives, legislators, the news media, and the citizenry. We are far from the transparency and methodological rigor required by Jeffersonian budgeting, but much progress has been made.

References

Alexander, P. 2003. Reforming Hawaii's public schools after 30 years of deterioration will take teamwork, true accountability, consequences. *Hawaii Reporter*, April 30.

Ammons, D. N. 1999. A proper mentality for benchmarking. *Public Administration Review* 59:105–109.

Andrews, M., and H. Hill. 2003. The impact of traditional budgeting systems on the effectiveness of performance-based budgeting: A different viewpoint on recent findings. *International Journal of Public Administration* 26:135–155.

Axelrod, D. 1995. *Budgeting for modern government*. 2nd Ed. New York: St. Martins.

Baiocchi, G., and J. Lerner. 2007. Could participatory budgeting work in the United States? *The Good Society* 16:8–13.

Behn, R. D. 1999. Performance measures in state administrative agencies: Bureaucratic hoop jumping or management tool? Remarks prepared for the annual conference of the National Association of State Chief Administrators, Salt Lake City, UT.

Boardman, A. E., D. H. Greenberg, A. R. Vining, and D. L. Weimer. 2001. *Cost-benefit analysis*. Upper Saddle River, NJ: Prentice Hall.

Bourdeaux, C. 2006. Do legislatures matter in budgetary reform? *Public Budgeting & Finance* 26(1): 120–142.

Bourdeaux, C. 2008. The problem with programs: Multiple perspectives on program structures in program-based performance-oriented budgets. *Public Budgeting & Finance* 28(2):20–47.

Boyne, G., R. Ashworth, and M. Powell. 2000. Testing the limits of incrementalism: An empirical analysis of expenditure decisions by English local authorities, 1981–1996. *British Journal of Public Administration* 78:51–73.

Brown, R. E. 2005. Enron/Anderson: Crisis in U.S. accounting and lessons for government. *Public Budgeting & Finance* 25(3):20–32.

Brown, R. E., and J. B. Pyers. 1988. Putting teeth into the efficiency and effectiveness of public services. *Public Administration Review* 48: 735–742.

Burns, R. C., and R. D. Lee, Jr. 2004. The ups and downs of state budget process reform: Experience of three decades. *Public Budgeting & Finance* 24(3):1–19.

Center for State Higher Education Policy and Finance, with the assistance of MGT of America, Inc. 1991. A study of the funding process for state colleges and universities. Washington, DC: American Association of State Colleges and Universities.

Chi, K. S., K. A. Arnold, and H. M. Perkins. 2003. Trends in state government management: Budget reduction, restructuring, privatization and performance budgeting. *The book of the states*. Lexington, KY: Council of State Governments pp. 419–427, 441–443.

Courty, P., and G. Marschke. 2003. Performance funding in federal agencies: A case study of a federal job training program. *Public Budgeting & Finance* 23(3):22–48.

Dugan, R. E., and P. Hernon. 2002. Outcomes assessment: Not synonymous with inputs and outputs. *Journal of Academic Librarianship* 28:376–380.

Epstein, P. D., and W. Campbell. 2002. Use and effects of using performance measures for budgeting, management and reporting. Case Study: State of Louisiana. GASB. http://www.seagov.org/sea_gasb_project/state_la.pdf

ExpectMore.gov. http://www.whitehouse.gov/omb/expectmore/about.

Frisco, V., and O. J. Stalebrink, 2008. Congressional use of the program assessment rating tool. *Public Budgeting & Finance* 28(2):1–19.

Gilmour, J. B. 2006. Implementing OMB's program assessment rating tool (PART): Meeting the challenges of integrating budget and performance. Armonk, NY: IBM Center for the Business of Government. Managing for Performance and Results Series. http://www.businessofgovernment.org/pdfs/GilmourReport.pdf.

Goodman, D., and E. J. Clynch. 2004. Budgetary decision making by executive and legislative budget analysts: The impact of political cues and analytical information. *Public Budgeting & Finance* 24(3):20–37.

Government Accountability Office (GAO). 2005a. Performance budgeting: States' experiences can inform federal efforts. Washington, DC: GAO. http://www.gao.gov/newitems/d05117sp.pdf

Government Accountability Office (GAO). 2005b. Performance budgeting: Efforts to restructure budgets to better align resources with performance. Washington, DC: GAO. http://www.gao.gov/new.items/d05215.pdf

Government Performance Project (GPP). 2005. Grading the states '05, Hawaii. http://www.governing.com/GPP/2005/hi.html

Government Performance Project (GPP). 2008a. Grading the states '08, Hawaii. http://www.governing.com/GPP/2008/hi.html

Government Performance Project (GPP). 2008b. Grading the states '08, Illinois. http://www.governing.com/GPP/2008/il.html

Governmental Accounting Standards Board (GASB). 1994. *Concepts statement no. 2 on concepts related to service efforts and accomplishments reporting*. Norwalk, CT: GASB.

Governmental Accounting Standards Board (GASB). 2002. *Report on the GASB citizen discussion groups on performance reporting*. Norwalk, CT: GASB.

Grafton, C. 1970. The coordination of state universities in Indiana and Illinois. PhD dissertation, Purdue University, 1970.

Grafton, C., and A. Permaloff. 1985a. Budget implementation with the microcomputer, *Public Productivity Review* 9(1):202–212.

Grafton, C., and A. Permaloff. 1985b. Microcomputer usage by state financial managers, *Social Science Microcomputer Review* 3:205–208.

Grafton, C. and A. Permaloff. 1996. The use of analysis by governors' budget offices. *Southeastern Political Review* 24:675–697.

Grafton, C., and A. Permaloff. 2000. Budgetary analysis using computer tools. In *Handbook of Public Information Systems*, ed. G. D. Garson, 429–446. New York: Marcel Dekker.

Grafton, C., and A. Permaloff. 2003. Computer tools for better public sector management. In *Public Information Technology: Policy and Management Issues,* ed. G. D. Garson, 190–220. Hershey, PA: Idea Group Publishing.

Grafton, C., and A. Permaloff. 2005. Analysis and communication for public budgeting. In *Handbook of Public Information Systems* (2nd ed.), ed. G. D. Garson, 463–487. Boca Raton, FL: CRS Press, Taylor & Francis Group.

Grafton, C., and A. Permaloff. 2007. Computer tools for public sector management. In *Modern Pubic Information Systems: Issues and Challenges*, ed. G. D. Garson, 239–264. Hershey, PA: IGI Global.

Grafton, C., A. Permaloff, W. E. Osterhoff, M. J. Gilbert, and N. R. Cox, Jr. 1991. The PONI capital planning program: A system that works, *Public Productivity and Management Review* 15(1): 77–94.

Grizzle, G. A., and C. D. Pettijohn. 2002. Implementing performance-based program budgeting: A system-dynamics perspective. *Public Administration Review* 62:51–62.

Hawaii Department of Budget and Finance. 2007. The executive biennium budget: FY 2007–2009 budget in brief.

Hawaii House Blog. 2008a. The budget bill passes third reading. March 10. http://hawaiihouseblog.blogspot.com/2008/03/budget-bill-passes-third-reading.html.

Hawaii House Blog. 2008b. About last night.... April 24. http://hawaiihouseblog.blogspot.com/search/label/Budget.html.

Heinrich, C. J. 2002. Outcomes-based performance management in the public sector: Implications for government accountability and effectiveness. *Public Administration Review* 62:712–724.

Ho, A. T-K., and A.Y. Ni. 2005. Have cities shifted to outcome-oriented performance reporting? A content analysis of city budgets. *Public Budgeting & Finance* 25(2):61–83.

Jordan, M. M., and M. M. Hackbart 1999. Performance budgeting and performance funding in the states: A status assessment. *Public Budgeting & Finance* 19(1):68–88.

Key, V. O. Jr. 1940. The lack of a budgetary theory. *American Political Science Review* 34:1137–1144.

Kreklow, S. R. 2006a. Five critical factors: Preparing for success in implementing performance management. *Government Finance Review* 22:54–56.

Kreklow, S. R. 2006b. Best practices for capital project analysis: Decision makers need to analyze a proposed capital investment from many perspectives before committing to the project. *Government Finance Review* 22:56–58.

Lawson, R. A., W. O. Stratton, and T. Hatch. 2007. Scorecarding in the public sector: Fad or tool of choice. *Government Finance Review* 23:48–52.

Lee, R. D. Jr, R. W. Johnson, and P. G. Joyce. 2004. *Public budgeting systems*. 7th Ed. Sudbury, MA.

McCue, C. P. 1999. The impact of objective and empathic dispositions on local government budget analysts' spending preferences. *Public Budgeting & Finance* 19(1): 89–114.

McKeown, M. P. 1989. State funding formulas for public institutions of higher education. *Journal of Public Finance* 15:101–112.

McNab, R. M., and F. Melese. 2003. Implementing the GPRA: Examining prospects for performance budgeting in the federal government. *Public Budgeting & Finance* 23(2):73–95.

McTigue, M. 2004. Performance budgeting and OMB's program assessment rating tool (PART). Testimony before the Subcommittee on Government Efficiency and Financial Management, Committee on Government Reform, U.S. House of Representatives.

Melkers, J., and K. Willoughby. 1998. The state of the states: Performance budgeting requirements in 47 out of 50. *Public Administration Review* 58:66–73.

Melkers, J., and K. Willoughby. 2004. Staying the course: The use of performance measurement in state governments. Armonk, NY: IBM Center for the Business of Government.

Melkers, J., K. Willoughby, B. James, J. Fountain, and W. Campbell. 2002. Performance measurement at the state and local levels: A summary of survey results. Norwalk, CT: Governmental Accounting Standards Board. http://www.seagov.org/sea_gasb_progject/ 1998_survey.pdf.

Merewitz, L., and S. H. Sosnick. 1971. *The budget's new clothes*. Chicago: Markham.

Mosher, F. 1969. Limitations and problems of PPBS in the states. *Public Administration Review* 29: 160–167.

Nas, T. F. 1996. *Cost-benefit analysis*. Thousand Oaks, CA: Sage.

National Advisory Council on State and Local Budgeting (NACSLB). 1998. *A framework for improved state and local government budgeting and recommended practices.* Chicago: NACSLB. http://www.co.larimer.co.us/depts/commis/budget/budget_practices.pdf

Novick, D. 1954. *Which program do we mean in "program budgeting?*" Santa Monica, CA: Rand Corporation.

Novick, D. 1972. *Program budgeting*. Santa Monica, CA: Rand Corporation.

Novick, D. 2002. What program budgeting is and is not. In *Government budgeting*, ed. A. C. Hyde, 52–68. N.p.: Wadsworth.

Office of Management and Budget (OMB). 2008. Assessing program performance. 2008 Guidance. http://www.whitehouse.gov/omb/part

Pagano, M. A., and D. R. Shock. 2007. Capital budgets: The building blocks for government infrastructure. *Government Finance Review* 23:16–22.

Pettijohn, C. D., and G. A. Grizzle. 1997. Structural budget reform: Does it affect budget deliberations? *Public Budgeting, Accounting & Financial Management* 9:26–45.

Phillips, P. A., and B. Abey. 2007. Using the Web to increase transparency and accountability. *Government Finance Review* 23:32–38.

Posner, P. L. 2003. Performance budgeting: Current developments and future prospects. Testimony before the Subcommittee on Government Efficiency and Financial Management, Committee on Government Reform, U.S. House of Representatives. http://www.gao.gov/newitems/d03595t.pdf

Posner, P. L. 2004. Performance budgeting: OMB's program assessment rating tool presents opportunities and challenges for budget and performance integration. Statement before Subcommittee on Government Efficiency and Financial Management, Committee on Government Reform, U.S. House of Representatives. http://www.gao.gov/newitems/ d04439t.pdf.

Robinson, M., and J. Brumby. 2005. Does performance budgeting work? An analytical review of the empirical literature. *International Monetary Fund 2005 working paper* 05/210.

Sakaguchi, R. 2000. Hawaii. In *Proceedings* ed. R. Huefner. Roundtable: State budgeting in the 13 western states. Western Political Science Association Annual Meeting, San Jose, CA. http://www.cppa.utah.edu/ westernstatesbudgets/ WPSA00/hi.html

Sallack, D., and D. N. Allen. 1987. From impact to output: Pennsylvania's planning programming budgeting system in transition. *Public Budgeting & Finance* 7(1):38–50.

Schedler, K. 1994. Performance measurement in a direct democratic environment: Local government reforms in Switzerland. *Public Budgeting & Finance* 14(4):36–53.

Schick, A. 1966. The road to PPB: The stages of budget reform. *Public Administration Review* 26:243–258.

Schmid, A. A. 1989. *Benefit-cost analysis*. Boulder, CO: Westview.

Skok, J. E. 1980. Budgetary politics and decision making: Development of an alternative hypothesis for state government. *Administration and Society* 11:445–460.

Thurmaier, K. 1995. Decision making in the executive budget process: Analyzing the political and economic propensities of central budget bureau analysts. *Public Administration Review* 5:448–460.

United States Commission on Organization of the Executive Branch of the Government. Budgeting and Accounting. 1949. Washington, DC: USGPO.

Wanat, J. 1978. *Introduction to budgeting.* North Scituate, MA: Duxbury.

Wildavsky, A. 1984. *The politics of the budgetary process*. 4th Ed. Boston: Little, Brown.

Willoughby, K.G. 1993a. Decision making orientations of state government budget analysts: Rationalists or incrementalists? *Public Budgeting and Financial Management* 5:67–114.

Willoughby, K.G. 1993b. Patterns of behavior: Factors influencing the spending judgments of public budgeters. In *The Handbook of Comparative Public Budgeting and Financial Management*, ed. T. D. Lynch and L. L. Martin, 103–132. New York: Marcel Dekker.

Willoughby, K.G. 2004. Performance measurement and budget balancing: State government perspective. *Public Budgeting & Finance* 24(2):21–39.

Willoughby, K. G., and M. A. Finn. 1996. Decision strategies of the legislative budget analyst: Economist or politician? *Journal of Public Administration Research and Theory* 6: 523–546.

Willoughby, K.G., and J. E. Melkers. 2000. Implementing PBB: Conflicting views of success. *Public Budgeting & Finance* 20(1):105–120.

Wilson, W. 1941. The study of administration. *Political Science Quarterly* 56:481–506.

Chapter 25

Performance Reporting Requirements for Information Technology and E-Government Initiatives

Patrick R. Mullen

CONTENTS

25.1 Introduction

E-government uses information technology (IT), especially the Internet, to improve the delivery of government services to the public, as well as businesses and government agencies. E-government has the potential to more directly connect government with the public, thereby opening new opportunities, but also giving rise to new challenges. For example, e-government enables the public to interact with and receive services from the federal government 24 hours a day, 7 days a week,[*] making service delivery more convenient, dependable, and less costly. The Gartner Group describes e-government as "the continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology [IT], the Internet, and new media."[†] Section 2 of the E-Government Act defines e-government as:

> the use by the Government of web-based Internet applications and other information technologies, combined with processes that implement these technologies, to (A) enhance the access to and delivery of Government information and services to the public, other agencies, and other Government entities; or (B) bring about improvements in Government operations that may include effectiveness, efficiency, service quality, or transformation.

As part of e-government, federal agencies have implemented a wide array of IT applications, including using the Internet to collect and disseminate information and forms; buying and paying for goods and services; submitting bids and proposals; and applying for licenses, grants, and benefits. Although substantial progress has been made, according to the U.S. Government Accountability Office (GAO),[‡] the full potential of e-government has not yet been reached.

Recognizing the magnitude of modern challenges facing the federal government, Congress has encouraged a more performance-based approach to program management and accountability within the federal government, enacting the Government Performance and Results Act of 1993 (GPRA), perhaps the best-known performance-based law. To be most useful, program managers should consider the reports developed in response to GPRA when they write the performance reports required by specific IT and e-government laws discussed in this chapter.

Some of the first IT performance-based laws, focusing on the importance of using IT to improve government operations, were the Paperwork Reduction Act of 1980 (reauthorized in 1995), the Computer Security Act of 1987, and the Clinger–Cohen Act of 1996. Congress recognized the growing importance of e-government in 1998 by enacting the Government Paperwork Elimination Act. It requires federal agencies to use IT in order to provide the public, when practicable, the option of submitting, maintaining, and disclosing required information electronically. The E-Government Act of 2002 includes promoting the use of the Internet and other

---

[*] Seifert, Jeffrey W. A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance (updated January 28, 2003), Congressional Research Service: Washington, DC, 2003. Please also see Seifert, Jeffrey W. Reauthorization of the E-Government Act: A Brief Overview, Congressional Research Service: Washington, DC, 2008.

[†] Gartner Group. Key Issues in E-Government Strategy and Management, Research Notes, Key Issues, May 23, 2000.

[‡] See, for example, Electronic Government: Success of the Office of Management and Budget's 25 Initiatives Depends on Effective Management and Oversight (GAO-03-495T, Mar. 13, 2003) and Electronic Government: Federal Agencies Have Made Progress Implementing the E-Government Act of 2002 (GAO-05-12, Dec. 10, 2004). Washington, DC.

IT to provide government services electronically; strengthening agency information security; and defining how to manage the federal government's growing IT personnel needs. In addition, this law established an Office of Electronic Government within the Office of Management and Budget (OMB), to provide strong central leadership and full-time commitment to promoting and implementing IT and e-government. This relatively small office, since renamed the Office of E-Government and Information Technology in the Obama administration, faced and continues to face implementation issues to achieve its broad mission, including not being fully funded by Congress (e.g., no more than $5 million in each fiscal year out of $345 million authorized each year from fiscal year 2003–2007). However, one useful task the office can perform is to review the IT and e-gov performance laws to see if the numerous reporting requirements can be consolidated, thereby providing a more comprehensive discussion of agency IT and e-gov activities than currently exists.

25.2 Laws for Performance-Based Management and Accountability

GPRA—or "the Results Act"—is a key performance-based law for management and accountability. Prior to enactment of GPRA, policymaking, spending decisions and oversight had been severely handicapped by a lack of (1) sufficiently precise program goals; and (2) program performance and cost information. GPRA sought to remedy that situation by following private sector best practices, requiring agencies to set multiyear strategic goals and corresponding annual goals, to measure performance toward the achievement of those goals, and to report on progress made. IT managers and those with an interest in expanding use of e-government to better serve the public should read agency GPRA reports in order to gain an overview of strategic goals and performance measures.

In instituting IT performance-based laws, Congress followed private sector best practices, as with GPRA, enabling agencies to more effectively manage IT requirements. Under IT performance-based laws, agencies are required to better link technology plans and IT use to program missions and goals. To do this, agencies are to (1) involve senior executives in IT management decisions; (2) establish senior-level chief information officers (CIOs) who are to evaluate IT programs on the basis of applicable performance measurements; (3) impose much-needed discipline on technology spending; (4) redesign inefficient work processes; and (5) use performance measures to assess the contribution of IT to the achievement of mission results. In addition, laws such as the Computer Security Act of 1987, as amended in 1996, address the importance of ensuring and improving the security and privacy of sensitive information in federal computer systems. IT performance-based laws, including purposes, are summarized in Table 25.1.

Implemented together, GPRA and IT performance-based laws provide a powerful framework for developing and fully integrating information about (1) agencies' missions and strategic priorities; (2) the results-oriented performance goals that flow from those priorities; (3) performance data showing the level of goal achievement; and (4) investments in IT in relation to goals achieved, along with reliable and audited financial information about the costs. This framework should promote a more results-oriented management and decision-making process within Congress, OMB, and federal agencies. Reports required by these laws can provide information that is pertinent to a broad range of management-related decisions confronting IT and e-government managers. In addition, these reports help members of Congress with responsibilities for budget, authorization, oversight, and appropriations committees. However, as pointed out by GAO and OMB on several

Table 25.1 Performance-Based Laws and Their Purpose

IT Law	*Purpose*
Paperwork Reduction Acts of 1980 and 1995	Minimize the public's paperwork burdens; coordinate federal IRM; ensure the integrity of the federal statistical system
Computer Security Act of 1987	Improve the security and privacy of sensitive information in federal computer systems
Clinger–Cohen Act of 1996	Improve federal programs through improved acquisition, use, and disposal of IT resources
Government Paperwork Elimination Act of 1998	Requires federal agencies to provide the public, when practicable, the option of submitting, maintaining, and disclosing required information electronically
Government Information Security Reform Act of 2001	Direct federal agencies to conduct annual IT security reviews; IGs to perform annual independent evaluations of agency programs and systems and report results to OMB; OMB to (1) report annually to Congress on government-wide progress and (2) issue guidance to agencies on reporting instructions and quantitative performance measures
E-Government Act of 2002	Promote the use of the Internet and other ITs to provide government services electronically; strengthen agency information security; define how to manage the federal government's growing IT human capital needs; establish an Office of Electronic Government, within OMB, to provide strong central leadership and full-time commitment to promoting and implementing e-government

occasions,* critical implementation issues remain to be addressed. As discussed below, although the legal framework for more performance-based IT and e-government is in place, key parts are in their first years of implementation; how best to integrate and implement reporting requirements continues to be a work in progress.

25.3 Timing of Performance-Reporting Requirements in Relation to the Congressional Budget Process

Performance-based laws contain different reporting requirements, which are due at various times during the fiscal year; key dates for the fiscal year and legal sources are given in Table 25.2. These

* See GAO and OMB Web sites for recent reports on federal management, performance reporting, and IT and e-government (http://www.gao.gov and http://www.omb.gov). There are many GAO and OMB reports on these issues, and examples are cited in notes iii and xi.

Table 25.2 Key Dates and Legal Sources for Selected Performance-Reporting Requirements

Date	*Source*
October 1	Beginning of fiscal year, Congressional Budget Act, 31 USC Sec. 1102
October 30	Agency heads submit GISRA reports, to the director of OMB, with the results of each evaluation required under the act; each year, the Director of OMB submits to Congress a report summarizing the data received from agencies in that year
October 31	IGs' first semiannual reports to agency heads,[a] Inspector General Act, 5 USC App. 3, Sec. 5
November 30	Agencies submit Inspectors' General 1st semiannual reports, including agency heads' comments, to Congress (see note 1), Inspector General Act, 5 U.S.C. App. 3, Sec. 5.
December 31	Agencies submit federal managers' Financial Integrity Act reports to the president and the Congress, 31 USC Sec. 3512(d)
January 31	OMB's government-wide, 5-year financial management plan sent to Congress for each succeeding 5 year period, as well as a report on accomplishments for the preceding fiscal year, Chief Financial Officers Act, 31 USC Sec. 3512(a)
February	OMB must include in the president's annual budget submission to Congress, due no later than the first Monday of February, a report on the net performance benefits achieved due to major capital investments, as well as reports from agencies on their progress in using IT,[b] Information Technology Management Reform Act, (Clinger–Cohen Act), 40 USC Sec. 1412 Beginning with the budget submission for fiscal year 1999, and annually thereafter, the president must include agencies' annual performance plans, 31 USC Sec. 1115(a), and a government-wide performance plan for the succeeding fiscal year, 31 USC Sec. 1105(a)(28), GPRA
March 1	OMB's e-government status report to the Committee on Governmental Affairs, the Senate, and the Committee on Government Reform, the House of Representatives Agencies audited financial statements to OMB, Chief Financial Officers Act and Government Management Reform Act, 31 USC Sec. 3515(a)
March 31	Audited consolidated financial statements to the president and the Congress, Government Management Reform Act, 31 USC Sec. 331(e) Beginning March 31, 2000, agencies' annual performance reports to OMB, GPRA, 31 USC Sec. 1116

continued

Table 25.2 (continued)

Date	*Source*
April 30	CFOs' reports to agency heads and OMB, Chief Financial Officers Act and Government Management Reform Act, 31 USC Sec. 902(a)(6) IG's second semiannual reports to agency heads,[a] Inspector General Act, 5 USC App. 3, Sec. 5
May[c]	The director of OMB annually submits to Congress a report summarizing the GISRA data received from agencies in that year
May 30	Agencies submit IG's second semiannual reports, including agency heads' comments, to Congress,[a] Inspector General Act, 5 USC App. 3, Sec. 5
September[d]	OMB's annual information resources management plan for the federal government to Congress, PRA, 44 USC Sec. 3514
September 30	Beginning September 30, 1997, and every 3 years thereafter, agencies' strategic plans to Congress and OMB covering the succeeding 5 fiscal years, GPRA, 5 USC Sec. 306

[a] The IGs' first semiannual report covers the last 6 months of the preceding fiscal year. The second semiannual report covers the first 6 months of the current fiscal year.
[b] Under the Clinger–Cohen Act, agency CIOs must report annually to the head of the agency, as part of the strategic planning and performance evaluation process, on the progress made in improving resource management capabilities of the agency's personnel.
[c] The act requires an annual report, but does not specify a reporting date; OMB usually submits the report in May.
[d] The act requires an annual report but does not specify a reporting date; OMB usually submits the report in September.

performance requirements—including GPRA, IT performance-based, and selected financial management—are ones the IT community should be aware of since they may affect IT reporting requirements. In addition, there are IT performance-based reporting requirements that do not have specific reporting dates and are, therefore, not included in Table 25.2, but discussed later. It should also be noted that there are laws, such as the Privacy Act of 1974 (P.L. 93-579), that affect IT and e-government management but do not have reporting requirements; these laws are therefore not discussed in this chapter.

In addition to the dates for requirements, there are several milestone dates in the congressional budget process, as shown in Table 25.3. Given that the performance-reporting requirements provide information that can be used in the budget process, it is important to view them in relation to the process. Performance and financial information is most useful to decision-makers when closely linked with the federal government's budget, as well as the appropriations process.

25.3.1 Performance-Reporting Requirements Produce Useful Information, but Implementation Issues Remain

The reporting requirements, if effectively implemented, produce program performance and financial information that has not previously been available to decision makers and the public. This information will be a valuable resource for Congress to use in carrying out its program

Table 25.3 Milestone Dates in the Congressional Budget Process

Milestone Date	*Budget Process Milestone*
No later than the first Monday in February	President submits budget
February 15	Congressional Budget Office submits report to budget committees
February 25	Committees submit views and estimates to budget committees
April 1	Senate Budget Committee reports concurrent resolution on the budget
April 15	Congress completes action on concurrent resolution on the budget
May 15	Annual appropriation bills may be considered in the House
June 10	House Appropriations Committee reports last annual appropriation bill
June 15	Congress completes action on reconciliation legislation
June 30	House completes action on annual appropriation bills
October 1	Fiscal year begins

Source: Congressional Budget Act of 1974, 2 USC Sec. 631.

authorization, oversight, and appropriations responsibilities, as well as to ensure the public a more accountable, as well as responsive, government. However, implementation of some of these laws, such as the Government Information Security Reform Act and E-Government Act, require integration of the resulting information to effectively implement performance-based laws. For example, agencies continue to work on developing results-oriented performance goals in conjunction with the cost-accounting systems needed to provide reliable program and cost information. In addition, more attention is being paid to the adequacy of agencies' performance goals, given OMB's use of the Program Assessment Reporting Tool (PART) to evaluate the effectiveness of federal agency programs. Such attention is bringing about changes to improve the adequacy of goals for OMB and federal agency heads.

25.4 Performance-Based Laws Require Specific Reports

This section discusses several performance-based laws and what information they require in reports to Congress.

25.4.1 Paperwork Reduction Acts of 1980 and 1995

The purpose of the Paperwork Reduction Act (PRA), as reauthorized, is to (1) minimize the public's paperwork burdens resulting from the collection of information by or for the federal government;

(2) coordinate agencies' information resources management (IRM) policies; (3) improve the dissemination of public information; and (4) ensure the integrity of the federal statistical system.[*] PRA also requires agencies to indicate, in strategic information management plans, how they are applying IRM to improve the effectiveness of government programs, including improvements in the delivery of services to the public.

PRA requires OMB, in consultation with agency heads, to set annual government-wide goals for the reduction—by at least 10% during fiscal years 1996 and 1997 and 5% during each of the next four fiscal years—of paperwork burden. PRA also requires OMB, in consultation with agency heads, to set annual agency goals that reduce, to the maximum extent practicable, the paperwork burden imposed on the public. Agencies cannot conduct or sponsor information collection, resulting in paperwork, unless the agency has taken a number of specified actions and OMB has approved the collection. OMB may not approve the collection for a period in excess of three years. To test alternative paperwork policies and procedures, PRA requires OMB to conduct pilot projects.

PRA also requires OMB (in consultation with certain other agencies) to develop and maintain a government-wide strategic plan for IRM. In particular, PRA requires agencies to develop and maintain a strategic IRM plan that describes how IRM activities help accomplish agency missions. In addition, PRA requires OMB to (1) keep Congress and congressional committees fully informed of the major activities under the act; and (2) report on such activities at least annually. In this report, OMB is to describe the extent to which agencies have reduced paperwork burdens on the public, as well as improved the quality and utility of statistical information, public access to government information, and program performance and mission accomplishment through IRM.

25.4.2 Computer Security Act of 1987

The purpose of the Computer Security Act, as amended,[†] is to improve the security, including privacy, of sensitive information in federal computer systems. To control loss and unauthorized modification or disclosure of sensitive information and to prevent computer-related fraud and misuse, the law relies on the National Institute of Standards and Technology (NIST) to develop standards and guidelines for computer systems to be promulgated by the Secretary of Commerce.

Under the law, all operators of federal computer systems, including both federal agencies and their contractors, are required to establish security plans. The Office of Personnel Management (OPM) is required to issue regulations concerning mandatory periodic training related to security awareness and accepted security practices. This training is for all personnel involved in management, use, or operation of federal computer systems that contain sensitive information. The law also establishes a Computer System Security and Privacy Advisory Board within the Department of Commerce. The purpose of the board is to identify emerging managerial, technical, administrative, and physical safeguard issues. The board is to report its findings to the Secretary of Commerce, the Director of OMB, the Director of the National Security Agency, and the appropriate congressional committees.

To date, agencies have developed information security plans and NIST has continued to issue standards and other guidance. However, reports from agency Inspectors General (IGs) and GAO

[*] U.S. Congress. *Paperwork Reduction Acts of 1980 and 1995*, P.L. 96-511 and P.L. 104-13.

[†] U.S. Congress. *Computer Security Act of 1987*, P.L. 100-235, 101 Stat. 1724 (1988), as amended by P.L. 104-106, 110 Stat. 701 (1996).

show that "major agencies," those with chief financial officers (CFOs), have significant information security weaknesses. These weaknesses pose risks—fraud, disruption, and disclosure of sensitive data—to federal operations.

25.4.3 Clinger–Cohen Act of 1996

The purpose of the Clinger–Cohen Act of 1996 (CCA) is to improve the productivity, efficiency, and effectiveness of federal programs through the improved acquisition, use, and disposal of IT resources.* Among other provisions, the law (1) encourages federal agencies to evaluate and adopt best management and acquisition practices used by both private and public sector organizations; (2) requires agencies to base decisions about IT investments on quantitative and qualitative factors—associated with the costs, benefits, and risks of those investments—and to use performance data to demonstrate how well the IT investments support improvements to agency programs—through measurements such as reduced costs, improved employee productivity, and higher customer satisfaction; and (3) requires executive agencies to appoint executive-level CIOs. The CCA also streamlines the IT acquisition process by eliminating the General Services Administration's central acquisition authority. The CCA places procurement responsibility directly with federal agencies and encourages the adoption of smaller and better integrated IT procurements.

The CCA requires OMB to (1) issue directives to executive agencies concerning capital planning and investment control, revisions to mission-related and administrative processes, and information security; (2) promote and improve the acquisition and use of IT through performance -based and results-based management; (3) use the budget process to analyze, through tracking and evaluation, the risks and results of major agency capital investments in IT systems and to enforce accountability of agency heads; and (4) report to Congress on agency progress and accomplishments.

The CCA amends the Paperwork Reduction Act (PRA) to require executive agency heads to appoint senior level CIOs responsible for the agency's information resources management (IRM) activities and reporting directly to the agency head. And CCA requires executive agencies to design and implement an IT acquisitions process, maximizing the value and assessing and managing the risks. The CCA also lists specific elements agencies must include in that process and requires integrating it with budget, financial, and program management decisions. Before making significant investments in IT, federal agencies must analyze mission-related and administrative practices, revising them as appropriate. Federal agencies must also benchmark these practices against comparable ones for public or private sector organizations. Finally, federal agencies must also ensure that information security practices are adequate to protect agency resources.

In addition, CCA requires agencies to assess IT personnel needs and capabilities. In particular, federal agencies must assess, as part of the GPRA strategic planning and performance evaluation process, (1) requirements for agency personnel concerning knowledge and skills in IRM; and (2) the extent to which positions and personnel at executive and management levels in the agency meet those requirements. Agencies must develop strategies and plans for hiring, training, and—if any deficiencies are found—professional development. More details on the specific reporting requirements contained in CCA are shown in Table 25.4.

---

* U.S. Congress. *Clinger–Cohen Act of 1996*, P.L. 104-208. *The Omnibus Consolidated Appropriations Act of 1997* (P.L. 104-208), combining both the *Federal Acquisition Reform Act of 1996* (P.L. 104-106, Div. D) and the *Information Technology Management Reform Act of 1996* (P.L. 104-106, Div. E), was renamed the *Clinger–Cohen Act of 1996*.

Table 25.4 Reporting Requirements of Clinger–Cohen Act (CCA)

CCA Section: Who Reports	*What Is to Be Reported*
5112(c): Director, OMB	Submit a report (at the same time the president submits his budget request) about (1) the net benefits achieved as a result of major capital investments made by executive agencies in information systems and (2) how the benefits relate to the accomplishment of the goals of the executive agencies
5112(j): Director, OMB	"Keep Congress fully informed" on improvements in the performance of agency programs and in accomplishing agency missions through the use of the best practices in IRM
5123(2): Federal agency heads	Submit annual report, to be included with the agency's budget submission to Congress, on the progress in achieving goals for improving the efficiency and effectiveness of agency operations and, as appropriate, the delivery of services to the public through the effective use of IT
5302: Administrator, OFPP[a]	Submit detailed test plans, procedures to be used, and lists of regulations to be waived before federal executive agencies conduct pilot programs to test alternative approaches to IT acquisition
5303: Administrator, OFPP[a]	Submit, not later than 180 days after completion of a pilot program to test alternative approaches to IT acquisition, a report to Congress and OMB on the results, findings, and recommendations derived from the pilot program
5312(e): Comptroller General, GAO	Monitor the conduct and review the results of acquisitions under "solutions-based contracting pilot programs" and submit to Congress "periodic" reports containing the comptroller general's views on the activities, results, and findings under those pilot programs
5401(c)(3): Comptroller General	Review pilot programs to test streamlined procedures for procuring IT products and services through online multiple-award schedules and report to Congress, not later than three years after the date on which each pilot program was established, the extent of competition for orders and the effect of streamlined procedures on (1) prices charged and (2) paperwork requirements for multiple-award schedule contracts and orders; in addition, include the effect of the pilot program on small businesses, especially socially and economically disadvantaged ones

[a] OFPP: Office of Federal Procurement Policy, within OMB.

25.4.4 Government Paperwork Elimination Act of 1998

The Government Paperwork Elimination Act of 1998, P.L. 105-277,[*] authorizes OMB to provide for acquisition and use of alternative IT by federal agencies. Alternative IT includes (1) electronic submission, maintenance, or disclosure of information as a substitute for paper; and (2) electronic

[*] U.S. Congress. *Government Paperwork Elimination Act of 1998,* P.L. 105-277, which was the omnibus consolidated and emergency appropriations act for the fiscal year ending September 30, 1999.

signatures in conducting government business through e-government transactions. The law calls for the Director of OMB, in conjunction with the National Telecommunications and Information Administration, to study the use of electronic signatures in e-government transactions and periodically report to Congress on the results of the study.

25.4.5 Government Information Security Reform Act of 2001 (GISRA)

The purposes of the Government Information Security Reform Act (GISRA) are the following:[*]

1. To provide a comprehensive framework for establishing and ensuring the effectiveness of controls over information resources that support federal operations and assets.
2. To recognize the highly networked nature of the federal-computing environment, including the need for federal government interoperability and, in the implementation of improved security management measures, ensure that opportunities for interoperability are not adversely affected.
3. To provide effective government-wide management and oversight of related security risks, including coordination of information security efforts throughout the civilian, national security, and law enforcement communities.
4. To provide for development and maintenance of the minimum controls required to protect federal information and information systems.
5. To provide a mechanism for improved oversight of information security programs in federal agencies.

The reporting requirements of GISRA are shown in Table 25.5.

25.4.6 E-Government Act of 2002

The E-Government Act of 2002 (E-GA)[†] was passed to enhance the management and promotion of e-government services and processes. To increase citizen access to government information and services, the law established a federal CIO in an Office of E-Government within OMB—which oversees IRM, including development and application in the federal government—and established a broad framework of measures that require the use of Internet-based IT. The law also authorizes $45 million for an e-government fund in the U.S. Treasury, to pay for IT projects aimed at linking agencies and facilitating information sharing.

The law is designed to streamline the government's information resources, close security gaps, and create more public-centered Web sites. In addition, E-GA

- directs OMB to establish an interagency committee on government information and to issue guidelines for agency Web sites,
- requires federal courts to establish web sites with information about the court and cases being presented,
- requires federal agencies to adhere to uniform security standards for information,
- creates an IT interchange program between the private and public sectors,

[*] U.S. Congress. *Government Information Security Reform Act of 2001,* P.L.106-39. GISRA was part of the national defense authorization for fiscal year 2001.

[†] U.S. Congress. *E-Government Act of 2002*, P.L. 107-347.

Table 25.5 Reporting Requirements of GISRA

GISRA Section: Who Reports	*What Is to Be Reported*
Sec. 3535: Each federal agency	Annually, each agency shall have performed an independent evaluation of the information security program and practices of that agency; each evaluation by an agency under this section shall include testing of the effectiveness of information security control techniques for an appropriate subset of the agency's information systems; an assessment must be made (on the basis of the results of the testing) of the compliance with the requirements of this subchapter; and related information security policies, procedures, standards, and guidelines
Sec. 3535: IG or independent evaluator	The IG or the independent evaluator performing an evaluation under this section may use an audit, evaluation, or report relating to programs or practices of the applicable agency
Sec. 3535: Each federal agency	Annually, not later than the anniversary of the date of the enactment of this subchapter, the applicable agency head shall submit to the director of OMB the results of (1) each evaluation required under this section, other than an evaluation of a system described under subparagraph (A) or (B) of section 3532(b)(2), and (2) each audit of an evaluation required under this section of a system described under subparagraph (A) or (B) of section 3532(b)(2)
Sec. 3535: Director, OMB	Annually, the Director of OMB shall submit to Congress a report summarizing the data received from agencies under subsection (c)
Sec. 3535: Director, CIA, and Secretary of Defense	Evaluations and audits of evaluations of systems, under the authority and control of the Director of Central Intelligence, and evaluations and audits of evaluation of National Foreign Intelligence Programs systems, under the authority and control of the Secretary of Defense, shall be made available only to the appropriate oversight committees of Congress, in accordance with applicable laws

- authorizes government-wide use of share-in-savings contracts, which permit agencies to pay contractors using savings realized through technological improvements, and
- requires federal agencies and OMB to submit reports to Congress (as shown in Table 25.6).

As shown in this table, there are many reporting requirements affecting federal IT and e-government. Several studies were mandated by the E-GA, including a feasibility study on integrating federal information systems across agencies and implementing up to five pilot projects; an interagency study on the best practices of federally-funded community technology centers; a study "on using information technology to enhance crisis response and consequence management of natural and manmade disasters;" and a study to examine disparities in Internet access based on demographic characteristics. These congressional reporting requirements resulted in the following special reports to Congress since the E-GA was implemented:

1. U.S. Office of Management and Budget, *Report to Congress on Implementation of Section 212 of the E-Government Act of 2002*, December 17, 2005

Table 25.6 Reporting Requirements of E-GA

E-GA Section: Who Reports	*What Is to Be Reported*
202 (b): Each federal agency	Agencies shall develop performance measures that demonstrate how e-government enables progress toward agency objectives, strategic goals, and statutory mandates; areas of performance measurement that agencies should consider include (1) customer service, (2) agency productivity, and (3) adoption of innovative IT, including the appropriate use of commercial best practices; agencies shall link their performance goals, as appropriate, to key groups, including citizens, businesses, and other governments, and to internal federal government operations
202 (g): Each federal agency	Compile and submit to the OMB Director an annual e-government status report on (1) the status of the implementation of e-government initiatives by the agency, (2) compliance by the agency with this act, and (3) how e-government initiatives of the agency improve performance in delivering programs to their constituencies
3606 (a)(b): Director, OMB	Not later than March 1 of each year, submit an e-government status report to the Committee on Governmental Affairs, the Senate, and the Committee on Government Reform, the House of Representatives; the report under subsection (a) shall contain (1) a summary of the information reported by agencies under section 202(f) of the E-Government Act of 2002, (2) the information required to be reported by section 3604(f), and (3) a description of compliance by the federal government with other goals and provisions of the E-Government Act
1706 (a)(b): Director, OMB	OMB, in cooperation with the National Telecommunications and Information Administration, is to conduct an ongoing study of the use of electronic signatures for (1) paperwork reduction and electronic commerce, (2) individual privacy, and (3) the security and authenticity of transactions; the director shall submit to Congress on a periodic basis a report describing the results of the study carried out

2. U.S. Office of Management and Budget, *Section 213 of the E-Government Act Report to Congress: Organizations Complementing Federal Agency Information Dissemination Programs*, April 15, 2005
3. National Research Council, *Improving Disaster Management: The Role of IT in Mitigation, Preparedness, Response, and Recovery*, 2007
4. U.S. General Services Administration, *Improving Access to the Internet, A Report to Congress as Required by the E-Government Act of 2002 Section 215*, January 24, 2005.

In addition, Title III of the E-Government Act is also referred to as the *Federal Information Security Management Act* (FISMA). FISMA lays out a framework for annual IT security reviews, reporting, and remediation planning, and replaces the annual GISRA report.

The next section discusses what the GISRA and E-GA reports tell Congress about the current state of IT and e-government activities.

25.5 Security Weaknesses Identified in Federal IT Performance Reports

The OMB identified 6 common government-wide weaknesses in its first 131-page GISRA report, *Fiscal Year 2002 Report to Congress on Federal Government Information Security Reform.*[*] The OMB GISRA reports are based primarily on agency and IG performance reports to OMB, along with information provided through plans of action and milestones, and agency IT budget materials. Agency fiscal year 2001 reports established a baseline of agency IT security performance. As a result of reviewing these materials, OMB identified these 6 IT security weaknesses:

1. Lack of agency senior management attention to IT security.
2. Nonexistent IT security performance measures.
3. Poor security education and awareness.
4. Failure to fully fund and integrate IT security into capital planning and investment control process.
5. Failure to ensure that contractor services are adequately secure.
6. Failure to detect, report, and share information on vulnerabilities.

In the fiscal year 2008, FISMA report to Congress (March, 2009), the OMB Office of E-Government and Information Technology reports that

> President Obama directed the National Security and Homeland Security Advisers to conduct an immediate review of the plans, programs, and activities underway throughout the government dedicated to cyber security. This 60-day interagency review will develop a strategic framework to ensure that U.S. Government cyber security initiatives are appropriately integrated, resourced and coordinated with Congress and the private sector. We look forward to working with the Congress to ensure the successful protection of our nation's cyber security. [OMB's FY 2008 FISMA Report to Congress (March 2009), p. 2]

As a result of GISRA and FISMA requirements and OMB performance measures, the federal government is now in a better position to measure progress in improving IT security, and funding for IT security is increasing. For fiscal year 2002, from a total IT investment of about $48 billion, agencies spent almost $2.7 billion for security measures. The OMB estimates in its most recent FISMA report that fiscal year 2008 funding for IT security was $4.2 billion out of a total government-wide IT investment of $68 billion. However, OMB points out that spending more does not always improve IT security performance. Rather, the key is effectively incorporating IT security in management and accountability at the project and agency levels.

The OMB states that agencies are demonstrating progress, although much work remains. While agencies have applied more rigorous IT security reviews, more threats and vulnerabilities have also materialized. OMB also refers to the government-wide plan to improve IT performance as specified in the FY 2008 FISMA Report to Congress:

[*] U.S. Office of Management and Budget. *Fiscal Year 2002 Report to Congress on Federal Government Information Security Reform* (GISRA report). The report can be found on the OMB Web site.

1. Review Agency Business Cases

   Part 7 (Exhibit 300) of OMB Circular A-11 requires agencies to submit a Capital Asset Plan and Business Case justification for major information technology investments. In their justification, agencies must answer a series of security questions and describe how the investment meets the requirements of the FISMA, OMB policy, and NIST guidelines. The justifications are then evaluated against specific criteria to determine whether the system's cyber-security, planned or in place, is appropriate.
2. Evaluate Reported Security Metrics

   We will be reviewing the security metrics provided by agencies in their quarterly and annual reports for FISMA compliance. The increased reported compliance by the agencies, which is supported by the IG's reports, indicates that it could be time to modify the metrics to improve the assurance of security. One goal for new metrics would be to move beyond periodic compliance reporting to more continuous monitoring of security.
3. Review Current Cyber-security Activities

   As noted above, President Obama has requested a 60-day review of all cyber-security activities within the Federal Government. The OMB will be participating in this review.

25.6 Some Observations about What to Include in Future IT Performance Reports

In addition to reporting on individual agency initiatives, it is important for OMB's future annual reports to expand on the larger interagency and intergovernmental aspects of IT and e-government activities. Increasingly, the challenges that the federal government faces are interagency, intergovernmental, and even international problems that cut across numerous programs, agencies, constituencies, and levels of government. For example, coordination and sharing among agencies, across horizontal organizational barriers, is a critical aspect of implementing effective IT and e-government solutions and developing and deploying major systems development projects. Fountain calls this the development of information capacity,[*] as well as information capital. Both capacity and capital are needed to support congressional and agency actions to address today's IT and e-government challenges and prepare for the future.

Such preparation includes transforming the federal government by maximizing IT performance and ensuring accountability. Although efforts to transform agencies—by improving performance and accountability—are under way, decisive action and sustained attention will be necessary, and more remains to be done. Increased efforts can ensure that the government has the information capacity to deliver on its promises and meet current and emerging needs. Undoubtedly contributing to these efforts will be OMB's Office of E-Government and Information Technology, created by the E-Government Act of 2002. As the author observed in previous articles,[†] in an increasingly networked and globalized world, attention will also need to be paid to efforts to build information

[*] Fountain, Jane E. Building *The Virtual State: Information Technology and Institutional Change,* Brookings Institution Press: Washington, DC, 2001. Please see also Mullen, Patrick R. The Need for Government-Wide Information Capacity, *Social Science Computer Review*: Winter, 2003.

[†] Mullen, Patrick R. The Need for Government-Wide Information Capacity, *Social Science Computer Review*: Winter, 2003. Please see also Mullen, Patrick R. U.S. Agency Performance Reporting: Time To Clear The "Crowded Management Space"? *International Journal of Public Administration* 30, 953–971, 2007.

capacity and networks with state and local governments, nongovernmental organizations, other countries, and international institutions. These efforts will need to be addressed in future agency IT performance reports.

25.7 Conclusion

As discussed in this chapter, there are many IT and e-government performance-reporting requirements associated with the federal government's IT utilization and e-government initiatives. The sound application and management of IT and e-government to support strategic program goals is an important part of any serious attempt to improve agency performance, cut costs, and enhance responsiveness to the public. In particular, through performance-reporting requirements, agencies can, and should, be expected to show how IT contributes to reducing operating costs, increasing productivity, and enhancing overall program quality. Agency track records can be established through reports to Congress, OMB, and others. These reports can form the basis for federal agency and congressional decision-making about (1) appropriate levels for continued funding; and (2) how to address future national and, increasingly, international IT and e-government needs. Each new administration brings its own priorities and the Obama administration is certainly starting to do so in the IT and e-gov areas. Therefore, Congress may also want to hold hearings and conduct systematic oversight of these activities as it prepares to reauthorize the E-Government Act and considers future funding for IT and e-gov investments.

References

Fountain, Jane E. *Building the Virtual State: Information Technology and Institutional Change*, Brookings Institution Press: Washington, DC, 2001.

Gartner Group. Key Issues in E-Government Strategy and Management, Research Notes, Key Issues, May 23, 2000.

Mullen, Patrick R. *The Need for Government-Wide Information Capacity*, Social Science Computer Review: Winter, 2003.

Mullen, Patrick R. E-Government Performance-Reporting Requirements, in *Handbook of Public Information Systems*, 2nd ed., edited by David Garson, Taylor & Francis Group, New York, 2005.

Mullen, Patrick R. U.S. Agency Performance Reporting: Time to Clear the "Crowded Management Space"? *International Journal of Public Administration* 30, 953–971, 2007.

National Research Council, *Improving Disaster Management: The Role of IT in Mitigation, Preparedness, Response, and Recovery*, Washington, DC, 2007.

Seifert, Jeffrey W. A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance (updated January 28, 2003), Congressional Research Service: Washington, DC, 2003.

Seifert, Jeffrey W. Reauthorization of the E-Government Act: A Brief Overview, Congressional Research Service: Washington, DC, 2008.

U.S. Congress. *Computer Security Act of 1987*, P.L. 100-235, 101 Stat. 1724 (1988), as amended by P.L. 104–106, 110 Stat. 701 (1996).

U.S. Congress. *Clinger–Cohen Act of 1996*, P.L. 104–208.

U.S. Congress. *E-Government Act of 2002*, P.L. 107–347.

U.S. Congress. *Government Information Security Reform Act of 2001*, P.L.106–39.

U.S. Congress. *Government Paperwork Elimination Act of 1998*, P.L. 105–277.

U.S. Congress. *Paperwork Reduction Acts of 1980 and 1995*, P.L. 96-511 and P.L. 104–13.

U.S. General Accounting Office. Electronic Government: Success of the Office Of Management and Budget's 25 Initiatives Depends on Effective Management and Oversight (GAO-03-495T, Mar. 13, 2003). Washington, DC.

U.S. General Services Administration, Improving Access to the Internet, A Report to Congress as Required by the E-Government Act of 2002 Section 215, Washington, DC, 2005.
U.S. Government Accountability Office. Electronic Government: Federal Agencies Have Made Progress Implementing the E-Government Act of 2002 (GAO-05-12, Dec. 10, 2004). Washington, DC.
U.S. Office of Management and Budget. Fiscal Year 2002 Report to Congress on Federal Government Information Security Reform (GISRA report), Washington, DC, 2003.
U.S. Office of Management and Budget, Section 213 of the E-Government Act Report to Congress: Organizations Complementing Federal Agency Information Dissemination Programs, Washington, DC, 2005.
U.S. Office of Management and Budget, Report to Congress on Implementation of Section 212 of the E-Government Act of 2002, Washington, DC, 2005.
U.S. Office of Management and Budget. Fiscal Year 2008 Report to Congress on Implementation of the Federal Government Information Security Management Act of 2002 (FISMA report), Washington, DC, 2009.
U.S. Office of Management and Budget. Fiscal Year 2008 Report to Congress on Implementation of the E-Government Act of 2002 (E-Gov report), Washington, DC, 2009.
U.S. Office of Management and Budget. Fiscal Year 2009 Report to Congress on the Benefits of the President's E-Government Initiatives, Washington, DC, 2009.

Chapter 26

Information Technology and Public Performance Management: Examining Municipal E-Reporting

Alicia Schatteman

CONTENTS

26.1 Introduction

The purpose of this chapter is to examine the current use of technology, broadly conceived, by local governments to communicate performance information. Beginning with a discussion of what we know about citizen demand for performance information online and to what extent local governments are providing online, I propose a model of four stages of e-reporting, including case illustrations. The chapter concludes with a summary of best practices for those governments considering the adoption or improvement of e-reporting.

Technology has fundamentally changed how governments communicate with citizens. We expect information to be readily available on a 24-hour basis in ways that can be customized according to our individual needs. Reporting government performance must be more than "timely," as GASB suggests; it must be instantaneous. Lee [2004] defined e-reporting as "the administrative activity that uses electronic technology for digital delivery of public reports that are largely based on performance information" [p. 75]. I would expand to include e-reporting to include not only performance reports but performance information, which may include financial data. The more citizens can access good information about their government, the more worthwhile performance management programs become not only for staff and elected officials, but, the community as well. "One of the most important innovations in public management recently has been the trend to electronic government" [Lee 2004, p. 73]. E-reporting has the potential to engage citizens in their local communities by providing them with information they need and can use to participate in a democratic society. "All government agencies should explore methods to involve citizens in shaping and administering policy through advisory boards, public meetings, and greater citizen involvement in what we call the co-production of public goods and services" [Macedo 2005, p. 113].

First, let's examine the demand by citizens for municipal government information online. According to the Pew Internet and American Life Project's most recent study on citizen use of government Web sites [Larsen and Rainie 2002], 68 million Americans access government Web sites, an increase of 70% from just two years before and likely much higher today. This number presents 58% of all American adults. Unfortunately, most of the Web traffic is to federal (80%) and state (76%) Web sites, not local (41%). Users are also more likely to find what they are looking for on federal and state Web sites compared to local government websites. Furthermore, there is a lack of knowledge on the part of the public about what their local governments actually do have online. A 2000 study [Norris, Fletcher and Holden 2001] found that despite the fact that most local governments have Web sites (80%), just half of all Internet users knew if their local government had a Web site or not. Those who do use government Web sites are generally dissatisfied with municipal Web sites. Horrigan [2004], also using data from The Pew Internet and American Life Project, showed that 97 million adult Americans, or 77% of Internet users, took advantage of e-gov in 2003, whether that meant going to government Web sites or e-mailing government officials. This represented a growth of 50% from 2002. At the same time, citizens who contact government said they are more likely to turn to traditional means (the telephone or in-person visits) rather than the Web or e-mail to deal with government. Of the 54% of Americans who contacted government in the past year, the telephone or in-person visits were preferred to the Web or e-mail by a 53% to 37% margin [Horrigan 2004].

A positive online experience can improve a government's relationship with its citizens and ultimately build trust. Previous research indicates that citizens who use the Internet say that it improves their relationship with government [Horrigan 2004]. "Trust in government correlates with having a good online experience at government Web sites" [Larsen and Rainie 2002:15].

Welch and Hinnant [2003] found that Internet use is positively associated with transparency satisfaction, which is associated with citizen trust in government.

Next, it is important to understand the current level of municipal government use of technology and their online presence. "Most e-government in the United States, today, is principally informational—that is, it involves the one-way transmission of information from government to citizens" [Norris and Moon 2005, p. 64]. Basically, whatever is available in print is "posted" online such as schedules, events, legislation, and calendars. In terms of the evolution of technology and local governments, it is slowly progressing. Because performance information is one type of information that governments report online, as municipalities improve their overall adoption and utilization, we would expect to see improvement in the use of technology to report performance information online.

Technology is a tool for government to communicate with citizens. We know that governments can communicate a vast amount of information from the basic schedules, reports, minutes, and other "static" types of documents. In this category, I would include the major budget or strategic plans. These are forecasting documents—a path chosen at one point in time. These documents are then used to compare actual performance. Actual performance results are reported in the end-of-year financial statements. Performance information can also be reported on various measures with data collected over a specific period of time, and the ones that are good, compare their performance to goals, to previous year's performance, and to other jurisdictions. To a great extent, we are in an era where performance information is statically reported at year-end, similar to the issuance of audited financial statements. This does not have to be the case, and may not even be desirable by the various stakeholders of performance information. Certainly, for performance reporting to be useful, public managers must use performance results for day-to-day decision making. Elected officials may want monthly or quarterly performance results, and citizens may want access to performance information 24/7. Certainly technology makes these various needs at least technologically possible.

26.2 Literature Review

City managers hold a unique perspective in local governments as they are in leadership positions in the organization and have access to political power. Their opinions and leadership matter to the adoption of IT, overall, and its use in communicating with the general public. Despite the fact that citizens may demand greater accessibility to staff and elected officials, city managers still have reservations using technology because of spam or unsolicited e-mails [Reddick and Frank 2006]. In addition, managers may have been convinced of the potential reduction in staffing in moving services online, which may or may not materialize, but is often touted as a key benefit. Nevertheless, the leadership and support of upper management in local government does matter to the successful utilization of IT.

Other factors also affect how successful e-government initiatives are adopted and implemented. For example, how the local government is structured for IT influences online services [Reddick 2005], and the existence of online services (supply) drives demand. A separate IT department of local governments in charge of developing the e-government budget may also increase citizen contact for that local government [Reddick 2005]. Furthermore, population size has been shown as having an impact on the level of e-government sophistication at the local level [Horrigan 2004]. More research is still needed to determine actual citizen demand for e-government services.

Local government Web masters are IT professionals, both familiar with the technology as well as the functionality. In a survey of webmasters [Ho 2002], respondents indicated that their own local government was moving away from a departmental mentality in Web management to a more inclusive approach that relies on information sharing, user satisfaction, innovative entrepreneurship and user customization, all meant to improve the e-government experience for users. Those cities moving towards this model, however, had a less diverse population and higher per capita incomes in their communities.

From the citizens' perspective, citizens generally contact their state government the most (36.82%), followed by the federal government (35.82%) and then local government (22.57%), according to Reddick [2004]. State governments have a number of programs and services that all residents need access to, such as drivers' licenses or income taxes. Local government goods and services such as water, roads, or garbage do not require regular communication with the local government. Local government is, however, responsible for services such as recreation and parks or permit applications. We go to them when we need them rather than with frequency like the other levels of government. Perhaps because of this, citizens may be less interested in e-government initiatives at the local level.

For those citizens who do access e-government services, they are generally happy with what they find (80%), according to the Pew Internet and American Life Project [Horrigan 2004]. In terms of accessing local government, citizens mostly agree that the Internet has improved the way they interact with their local government. About 40% of users had visited local government Web sites, and 46% say they found information more easily on local government Web sites than state or federal Web sites. However, local government Web sites still received the lowest ratings compared to federal or state Web sites. This is important because "Trust in government correlates with having a good online experience at government Web sites" [Larsen and Rainie 2002, p. 15], and Internet users say that e-government does improve their relationship with government [Horrigan 2004].

Finding information online is just one form of e-government, often referred to as "information-based e-government." Citizens going to government Web sites can generally find the information they are looking for, but they then have to move offline to complete a particular task such as renewing a registration, making an appointment, or submitting a claim, for example [Reddick 2004]. Because of this problem, it is unlikely that any staffing levels will be reduced in the near future because of local e-government initiatives.

It's not just important, what they are going to the Web site for, but it's also important how citizens actually connect to online services that matters. Horrigan [2004] found that those with high-speed connections say the Internet has improved interaction with government (at the local level) by a lot (35%); somewhat (22%); a little (20%); or not at all (30%). The numbers were slightly less positive for those with a dial-up or broadband connection, but the relationship to the federal and state government was the same.

Unfortunately, although Internet use has increased, there is still a problem with universal access to the Internet. According to researchers from the Pew Internet and American Life project, nearly three-quarters of all American adults are Internet users, an all-time high and up from 66% just one year earlier. Internet use means connecting at home, work, or a school computer. Nearly half of all Americans (42%) have broadband Internet service, up from 29% in January 2005. Internet use still varies greatly across age groups. Nearly 90% of 18- to 29-year-olds go online, which falls to 32% of persons age 65 and older. Internet use also varies by income level with those in the lowest income households considerably less likely to go online. "Fifty-three percent of adults living in households with less than $30,000 in annual income go online, which rises to 91% of adults in households earning more than $75,000." Internet use also increases with

education—from 40% of adults who have less than a high school education compared with 91% of adults with at least a college degree [Madden 2006]. Nearly 80% of all American Internet users have gone online at some time to search for information from government agencies or to communicate with them [Horrigan 2004]. However, despite these large adoption rates, there is still a segment of the American population that does not have access to online goods and services, which any government must be mindful of when developing an e-government initiative.

26.3 Evolution of Communicating Performance Information

Reporting on government performance really began with reporting of financial information, specifically budget figures, hence the continued interest of public accountants in performance reporting [Ingram 1984; Baber 1983; Zimmerman 1977]. Lee [2006] has written one of the most comprehensive research articles regarding the history of municipal public reporting. According to Lee, municipal reporting began with the annual report, similar to its corporate cousin. Following the interest in the 1930s and 1940s, ICMA again sought to promote better municipal reporting to the public in the 1960s [Wall 1963]. Wall suggested the current municipal annual reports had "fallen short of attracting and retaining the interest of most of the citizens," unlike the more attractive reports prepared by other public and private institutions. Wall [ibid] suggested that municipal reports could again capture the attention of citizens by offering brief and timely information and reporting on municipal successes as well as problems.

During the 1970s, performance reporting received increased attention due to the growth in performance measurement. Professional associations began asking public administrators to think about performance measurement and how they could use these systems to improve government efficiency and effectiveness. The Urban Institute and ICMA were among the first, followed by the National Academy of Public Administration, the American Society for Public Administration, the Governmental Accounting Standards Board, and the Governmental Finance Officers Association.

26.4 North American Performance Reporting Principles

Public performance reporting began in earnest with a major piece of enabling legislation—the Government Performance and Results Act [GPRA] of 1993. The legislation outlines requirements for federal agencies to report their performance, their progress against their goals and then communicate that performance to Congress and the general public. On the heels of this legislation in the mid-1990s, the Government Accounting Standards Board (GASB) issued several reports about public performance reporting. Its mission is to "establish and improve standards of state and local governmental accounting and financial reporting that will result in useful information for users of financial reports and guide and educate the public, including issuers, auditors, and users of those financial reports" [GASB Web site]. The GASB issued a special report summary *Reporting Performance Information: Suggested Criteria for Effective Communication* in October 2003. This document outlined 16 suggested criteria in three broad categories. The first category is called external reporting of performance information defined as "a basis for understanding the extent to which an organization has accomplished its mission, goals, and objectives in the context of potential significant decision-making or accountability implications" [2003, p. 5], which includes purpose and scope, statement of major goals and objectives, involvement in establishing goals

and objectives, multiple levels of reporting, analysis of results and challenges, and focus on key measures, reliable information. The second major category is called "what performance information to report." This category includes the following principles: relevant measures of results, resources used and efficiency, citizen and customer perceptions, comparisons for assessing performance, factors affecting results, aggregation and disaggregation of information, consistency and communication of performance information. The performance information would be effectively communicated if the report is easy to find, to access, and to understand; and if the report is issued in a timely fashion and with regularity.

The GASB's reporting principles are meant to guide organizations as they report their performance to citizens and other constituencies. The criteria should be "used as a basis for that reporting so that users of performance reports understand what is and is not included in the report, and that the organization be committed to continually improving the reporting of performance information" [2003, p. 11]. The GASB's criteria have been used by many other jurisdictions and countries as the basis for excellent reporting. It is by far the most comprehensive of the other guidelines. In April 2007, GASB announced the latest work in assisting governments with performance reporting called service efforts and accomplishment (http://www.seagov.org). This new project moves away from stating that all governments must report their performance. Rather, this new project emphasizes flexibility for jurisdictions and "nonauthoritative guidance" or voluntary reporting.

A major critic of GASB's criteria, and one of the reasons that GASB has revised their hard-line stance, is the Government Finance Officers Association [GFOA]. Looking at performance reporting from the financial side, the organization has been very active in suggesting recommended practices of public performance reporting. The GFOA published "Preparing Popular Reports" in 1991, which was revised in 2006. They also award certificates of achievement for excellence in financial reporting based on a set of criteria outlined in "Popular Reporting Awards Program: Judge's Evaluation Form" [2007]. Their criteria include financial and non-financial performance. Judges use a 74-page checklist for each report. According to the GFOA, over 3,000 governments participate each year. The governments that receive high evaluations of their reports are issued a Certificate of Achievement for Excellence in Financial Reporting.

26.5 Evolution of Reporting Performance Information

I suggest that the stages of e-reporting mirror the stages of e-government. West [2005] defines four stages of e-government: the billboard or informational stage, the partial delivery stage, the portal stage, and the interactive democracy stage. Figure 26.1 shows the suggested stages of public e-reporting, then each stage is discussed along with a current example where available.

26.5.1 Stage 1: Post Reports

Mordecai Lee has written one of the most comprehensive research articles regarding the history of municipal public reporting [2006]. According to Lee, municipal reporting began with the annual report, similar to its corporate cousin. "Municipal reporting was in its heyday from the 1920s to the 1940s. Then, by the end of the 20th century, it gradually

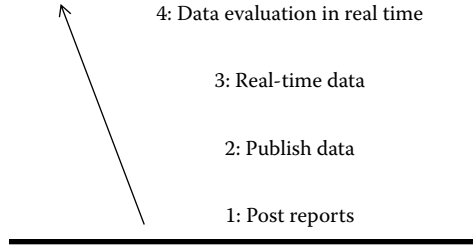


Figure 26.1 Stages of public e-reporting.

disappeared from the municipal administrator's agenda" [Lee 2006, p. 453]. With the dawning of the performance measurement era, municipal reporting, specifically performance reporting, is again growing as a major responsibility for municipal managers. Lee [2004] defined e-reporting as "the administrative activity that uses electronic technology for digital delivery of public reports that are largely based on performance information" [p. 75]. At this stage, performance reports are posted at, or several months after, the closing of the fiscal or calendar year. Therefore, the reports are, in effect, outdated by the time they are published. The performance reports become more archival than useful. Despite the fact that there are many organizations who have issued performance reporting principles and some municipalities have significantly improved their reports, reports are still being issued too long after the report has any real impact or influence. In effect, the performance report becomes the goal itself rather than the means to make corrections to performance, and the report's real usefulness is lost to time. Without question, there are many municipal governments who are still struggling with making a quality report. And the argument can be made that they should get their reports in good shape first, before moving on to the other stages of e-reporting. However, the technology itself may make static performance reports obsolete.

One example of this first stage of e-reporting is Ontario, Canada's Performance Measurement System. According to Schatteman [2009], almost all (96%) municipalities simply publish their performance online to comply with the mandated system requirements. The Municipal Act of Ontario, which details the mandates of the system, states that all municipalities must report their performance results by September of the following reporting year (http://www.mah.gov.on.ca). Along with the mandated system, 22 municipalities in the Province volunteered to participate in the Ontario Municipal Benchmarking Initiative. The reports generated through this voluntary system are also posted online to the Initiative's Web site (http://www.ombi.ca) and often on the participating municipality's Web site.

26.5.2 Stage 2: Publish Data

In the second stage, the performance information released, not just a summary report. The data may be released many months after the closing of the fiscal or calendar year, but the data are available in raw form. In the case of Ontario, Canada, the Province initiated a new Municipal Information and Data Analysis System (MIDAS). This system was a project of the Association of Municipalities of Ontario in partnership with the Ontario government (http://www.amo.on.ca). It is a Web-based tool that instantly converts the municipal performance data into meaningful reports, making benchmarking exercises convenient and fast. The data collected in the mandated performance measurement system go back to 2000, and performance data from the municipalities are uploaded to the online system monthly. It is apparently a user-friendly, open-ended, Web-based query tool. Municipalities are able to look at their own data, as well as data from other municipalities across the province, and the MIDAS system allows municipalities to generate reports including graphics. They can even create maps to show their results using the built-in geographic information system (GIS) component. Launched in 2007, the system is password-protected for the free use of the municipalities only. There is no public access to the MIDAS system—a major weakness in terms of transparency and accountability to citizens.

Another example of the second stage of performance e-reporting comes from Nova Scotia, Canada (http://www.gov.ns.ca/snsmr/muns/indicators/). They, like Ontario, have a mandated municipal performance measurement system called the Municipal Indicators Program. Unlike Ontario, the online portal is accessible to the general public. Users can look at all of the

measurements in the system, generate reports based on the raw data, and easily compare municipalities across several years. Data can even be downloaded in Excel for further analysis.

26.5.3 Stage 3: Real-Time Data

In the third stage, municipal governments go beyond uploading reports or even uploading raw data results. Municipalities post raw data results in real-time, thereby increasing relevance of results and timeliness, both major criticisms of current static performance reports. Performance information can, therefore, live up to the expectation of supporting decision making by municipal managers, elected officials and citizens.

An example of this stage is the Citywide Performance Reporting Tool in New York City. This online reporting tool (http://www.nyc.gov/html/ops/cpr/html/home/home.shtml) allows residents to examine performance at the very local level, using their street address. As part of this initiative, "My Neighborhood Statistics" lets New York City residents know how City agencies are performing in their neighborhood by viewing locally mapped performance statistics using a street address or intersection. New York City residents can find information such as 311 statistics, statistics by subject matter in agency group tabs, and a search tab to customize their search by location or key word. The agency groups include Health, Education and Human Services; Infrastructure, Administrative and Community Services; Public Safety and Legal Affairs; and Business and Cultural Affairs. Data is available by month, year to date, fiscal, and annual (and up to four previous years where available). Data can be summarized in basically two formats. One of these formats is a portable document format (PDF) file, which links to the appropriate city map or can be viewed as tables at the community board, precinct, or school region level. All statistics are defined for the user. Sources are given for the data, giving them the name of the agency, department or office that provided the data and link directly to that organization. Data can also be exported in raw format as a common spreadsheet file for residents to view, print, or analyze further.

New York also uses CompStat, a real-time performance measurement system to monitor crime in the city. Data are published online (http://www.nyc.gov/html/nypd/html/crime_prevention/crime_statistics.shtml) each week and by type of crime. Crime statistics are also published for all five boroughs and each precinct in that borough. The performance information is available in prepared PDF files. Each report contains comparisons to past data (week to date, 28 day, year-to-date, and multi-year back to 1990).

26.5.4 Stage 4: Data Evaluation in Real-Time

At this stage, performance information is not simply posted and available; it is also evaluated to determine how performance is meeting certain goals and targets. Evaluation in this sense is simply the resulting performance information released that a) does not meet, b) meets, or c) exceeds our stated goals and objectives. The Treasury Board of Canada uses a similar dashboard system that provides a snapshot, for senior management, of the overall "health" of an IM/IT project. The critical areas of interest on the Dashboard include project status; planned budget versus actual; planned timeframe and project progress; percentage of functionality that has been delivered, what is late and what is overdue; severity of the risk, impact to the project and source of the risk; staff turnover and overtime for the month; and overall health of the project. This is an internal management tool for the Treasury Board.

The other element of this stage is the ability for real-time comment and feedback by performance information users. I could find no systems currently in use that are open to the general public.

26.6 Summary of Best Practices

Multiple Levels of Reporting: Because different people should be able to access performance data in various formats at varying levels of detail. Technology easily accommodates the ability to customize reports for an individual based on his or her own needs and wants. Callahan [2007] suggested reporting should start at the summary level, then "by program or service, then by specific activities or demographic characteristics" [p. 83].

Visual Communication of Data: Presenting performance data online is more than simply "posting" information. The data needs to be communicated in a way that citizens can select the information they need easily. This is not a question of technology but overall design of the reporting system online, often an information dashboard. Few [2006] has written one of the best texts on the effective visual communication of data using online information dashboards. In his book, he cites examples of many dashboards currently in use by private companies. Few [2006] wrote that the best information dashboard is a "visual display of the most important information needed to achieve one or more objectives, which fits entirely on a single computer screen so it can be monitored at a glance" [p. 34].*

Real-time Performance Information: Having performance information available in real-time means the information is current and updated often. Real-time is a necessity if the performance information is really meant to assist with decision-making needs. This type of reporting would increase the usefulness of performance measurement programs.

Reporting Linked to Goals: Ideally, performance information should incorporate and be based on performance goals clearly described and articulated. This is necessary so performance management systems move beyond performance reporting for the sake of the reporting rather than to ultimately improve performance.

Accurate Performance Information: To build trust in the performance information by both government staff and citizens, data must be subject to verification and standardization of accounting practices. The verification process must be transparent to users of the information.

Multiple Levels of Reporting: For the system to function and be useful for multiple stakeholders, each type of stakeholder must have the ability to customize reports based on their own needs and wants. Certainly that is the main argument for using technology at all—the ability to

* Overall, dashboards graphically display a collection of measures. The dashboard then allows users to drill down for complimentary or more detailed information. Information can be tailored to compare information across time such as day, month, or year. The data can also be available in graphical format (such as pie charts, maps, or graphs) or in traditional data format such as tables and charts. Colors can also be used to underscore data results, such as coding data in green (good), yellow (satisfactory), or red (bad). Dashboards allow both a comprehensive overview of data as well as more detailed data to monitor progress or performance. Comparative data can also be incorporated so that certain measures can be compared with other jurisdictions. Evaluation of the information should also be incorporated into the dashboard so it allows users to see at a glance how goals or being met or targets reached. Information dashboards certainly accomplish the goal of focusing on the key performance measurements. Tufte [1990, 1997, 2001, 2006] has written some of the best books about ways to display quantitative information that is both visually pleasing and highly informative. He coined such terms as "data graphics" and "graphical performance" and he gave new meaning to the term "statistical graphics."

sort, edit, tabulate, and summarize large amounts of information quickly and effectively. Let the users define their own needs and level of detail required.

Visual Communication of Performance Information: Performance information can be used as a basis for a management dashboard that can be placed online for all to see and use. Based on a project management dashboard system, performance dashboards can be utilized with municipal performance goals/targets.

Training: Of course, for the technology to be most effective, training would be needed for staff, elected officials, and citizens to understand the performance information available and its usefulness. Training could take the form of online manuals, community workshops, or online videos. Ideally, a multiple training approach would capture the learning needs of the various stakeholder groups.

Open and Transparent Systems: A municipal e-reporting initiative should be accessible to the general public to serve the goals of accountability and transparency in government. All aspects of the system should be clearly identified so the end user can see how the system was developed, audited, and reported. In this way, trust is strengthened among the various stakeholder groups.

26.7 Conclusion

E-reporting has the potential to strengthen democracy by increasing accountability to citizens [Margetts 2003]. However, most municipalities seem to be at the beginning stages of e-reporting or posting of performance reports online. As we debate on the quality and format of these reports, we may miss the incredible potential uses of technology to publish public performance information.

We have a great distance to go to reach the full capabilities of the technology and the meet the promises of accountability and transparency in public performance management systems. There is debate in the area of performance measurement as to who should lead these efforts; the IT specialists, the public accountants, the communication's professionals? My answer is that any e-reporting of performance information must include a communication's focus and emphasis on the usability of information to all decision-makers including citizens. We must not report for the sake of reporting. "As part of an external relations and public communications program, e-reporting can contribute to the emergence of positive public opinion toward an agency" [Lee 2004, p. 75]. Positive public opinion can lead to more support for government initiatives and support for budget decisions. It is the responsibility of public administrators to decide how the information is presented to best represent results to citizens and be the most useful for decision making.

In conclusion, the field of public administration needs more empirical studies to assess the quality of public performance reports, particularly as municipal governments probably will continue to publish performance data online in this format. However, slowly these governments will evolve to publish more than reports online, possibly moving to posting actual results and in real-time. We need to learn more about approaches for doing so that are the most cost effective for government and the most useful for citizen users of this information.

References

Baber, W. R. (1983). Toward understanding the role of auditing in the public sector. *Journal of Accounting and Economics. 5*(2): 213–227.

Few, Stephen. (2006). *Information Dashboard Design: The Effective Visual Communication of Data*. Sebastopol, CA: O'Reilly Media, Inc.

Garnett, James L. (1992). *Communicating for Results in Government: A Strategic Approach for Public Managers*. San Francisco, CA: Jossey-Bass.

Ho, A. T.-K. (2002). Reinventing local governments and the e-government initiative. *Public Administration Review, 62*(4), 434–444.

Horrigan, John. (2004). How Americans get in touch with government, Pew Internet and American Life Project, Washington, DC. http://www.pewinternet.org

Ingram, R. W. (1984). Ingram, Economic incentives and the choice of state government accounting practices, *Journal of Accounting Research* 22:(1) 126–144.

Larsen, Elena and Rainie, Lee. (2002). The rise of the e-citizen: How people use government agencies' Web sites. Pew Internet and American Life Project. Washington, DC.

Lee, Mordecai. (2008). E-reporting: Using performance results to strengthen democratic accountability. In Mordecai Lee, ed. *Government Public Relations: A Reader*. Boca Raton, FL: Auerbach Publications, Taylor & Francis Group. pp. 381–393.

Lee, Mordecai. (2006a). The history of municipal public reporting. *International Journal of Public Administration.* 29: 453–476.

Lee, Mordecai. (2006b.) Empirical experiments in public reporting: Reconstructing the results of survey research, 1941–42. *Public Administration Review*. 66(2): 252–262.

Lee, Mordecai. (2006c). The rise and fall of the Institute for Government Public Information Research, 1978–1981. *Public Relations Review*. 32: 118–124.

Lee, Mordecai. (2004). *E-Reporting: Strengthening Democratic Accountability*. Washington, DC: IBM Center for The Business of Government.

Lee, Mordecai. (2001). Intersectoral differences in public affairs: The duty of public reporting in public administration. *Journal of Public Affairs.* 2(2): 33–43.

Lee, Mordecai. (1999). Reporters and bureaucrats: Public relations counter-strategies by public administrators in an era of media disinterest in government. *Public Relations Review*. 25 (Winter): 451–463.

Lee, Mordecai. (1998). Public relations in public administration: A disappearing act in public administration education. *Public Relations Review*. 24 (Winter): 509–520.

Lee, Mordecai. (1998–99). Public relations is public administration. *The Public Manager.* 27 (Winter): 49–52.

Macedo, Stephen. (2005). *Democracy at Risk: How Political Choices Undermine Citizen Participation, and What We Can Do About It*. Washington, DC: Brookings Institution Press.

Madden, Mary. (2006). Internet penetration and impact, data memo from the Pew Internet and American Life Project, Washington, DC. http://www.pewinternet.org

Norris, Donald F., Patricia D. Fletcher, and Stephen H. Holden. (2001). *Is Your Local Government Plugged In? Highlights of the 2000 Electronic Government Survey*. Washington, DC: International City/County Management Association.

Norris, Donald F. and Moon, M. Jae. (2005). Advancing e-government at the grassroots: Tortoise or hare? *Public Administration Review*. 65(1): 64–75.

Reddick, Christopher. (2007). The perceived impacts of e-government on U.S. cities: A survey of Florida and Texas city managers. *Government Information Quarterly*. 24: 576–594.

Reddick, Christopher. (2005). Citizen-initiated contacts with Ontario local e-government: Administrators' responses to contacts. *International Journal of Electronic Government Research.* 1(4): 45–62.

Reddick, Christopher. (2004). Citizen interaction with e-government: From the streets to the servers? *Government Information Quarterly*. 22: 38–47.

Reddick, Christopher and Howard Frank. (2006). The perceived impacts of e-government on U.S. cities: A survey of Florida and Texas city managers. *Government Information Quarterly.* 1(4): 45–62.

Schachter, Hindy Lauer. (1983). *Public Agency Communication: Theory and Practice*. Nelson-Hall, Chicago.
Schatteman, Alicia. (2009). Public Performance Reporting: Determinants of Excellence. PhD dissertation, Rutgers University, Newark, NJ.
Welch, Eric and Hinnant, Charles. (2003). Internet use, transparency, and interactivity effects on trust in government. Proceedings of the 36th Hawaii International Conference on System Sciences.
Zimmerman, Jerold. (1977). The municipal accounting maze: An analysis of political incentives. *Journal of Accounting Research*. 15: 107–144.

Chapter 27

The Challenges of Integrating Disparate Performance Data on a Governmental Web Site

Thomas J. Greitens and Lee Roberson

CONTENTS

27.1 Introduction

The federal government and most state and local governments have continually advanced their e-government initiatives since the end of the 1990s. From the bureaucratic perspective inside government, these initiatives resulted in newer hardware and software that made it easier to track revenues, expenditures, and personnel [Fountain 2002]. From the citizen perspective external to government, these initiatives also resulted in better governmental Web sites that

provided more online services and additional information about government for citizens [Seifert and Chung 2009].

During the same time frame that governments advanced their e-government initiatives, they also increased their collection of performance data. By the end of the 1990s, most governments, whether at the local, state, or federal level, required some quarterly or annual assessment of government performance. These requirements were often part of a renewed emphasis on performance assessment as a part of the New Public Management reforms that influenced government throughout the 1990s [Osborne and Gaebler 1992]. On some occasions, governments coupled their advancements in e-government with their newfound emphasis on the collection of performance data. For example, through the use of Enterprise Resource Planning (ERP) software or Public Finance Management (PFM) systems, many governments linked the use of newer software tools with the collection of performance data [Blalock and Barnow 2001; Fountain 2001; Swain and White 2005]. The goal of this union was ultimately better decision making, with policymakers and bureaucrats linking the performance of programs and/or agencies to funding decisions in the budget process [Hatry 2006].

While most of these linkages between performance and e-government occurred in the bureaucratic environment internal to government, some of the linkages also occurred on citizen accessible governmental Web sites. During this time, many governments made some performance data publicly available on government Web sites [Behn 2007]. The rationale behind this exposure was that if citizens could easily determine via a Web site how well their government was (or wasn't) performing, then an increase in citizen trust, participation, and accountability in government could occur [Roy 2007; McNeal, Hale, and Dotterweich 2008].

However, once governments started to place performance data on publicly accessible Web sites, a usability problem often prevented this type of citizen engagement from occurring. Scholars examining e-government Web sites discovered that while most Web sites put performance documents and data online; they usually did not offer citizens a way to manipulate the performance data in new ways [Behn 2007]. For example, if a citizen wanted to view the performance data for a local police department, the citizen could usually access a Web page containing various measures of performance for the police department. However, the citizen often could not manipulate the data in any additional way. They usually could not search the data to assess the performance of the police department by neighborhood, and they usually could not link performance response time in a neighborhood to crime rates or to the performance of other departments in a neighborhood such as a fire department or ambulance services. Instead, the citizen was usually left with a Web page that presented average performance information from one type of performance mandate for one department. Presented in this simplistic format, the citizen could not adequately hold government accountable because they could not easily search through measures, compile dissimilar types of measures from different performance mandates, or easily compare performance across programs.

The purpose of this chapter is to examine why governmental Web sites are not doing a better job of integrating performance data from different performance mandates in a more usable interface that can enhance citizen engagement and accountability. By examining three major federal performance mandates, this chapter identifies the statutory, data, and technical challenges of more fully integrating different types of performance data onto one governmental Web site. Solving these challenges help agencies and governments transition their performance mandates toward more integrated functionalities that may be able to enhance citizen trust, participation, and accountability. Such a transition also helps to advance the evolution of governmental Web sites as it enables citizens to access more performance data online and then use that information to hold governmental programs accountable.

27.2 The Evolution of Governmental Web Sites

Throughout the last decade, all levels of governments have used Web sites to communicate with citizens, offer services to their citizens, and even engage in online deliberations with their citizens. In many instances, these online activities have progressed from basic communication devices to fully interactive Web pages that allow for enhanced services. Researchers initially identified these governmental Web sites on a five-stage scale based on services offered. These stages included: an emerging Web presence with only one-way communications; an enhanced Web presence with more forms of communication such as e-mail and links to other governmental agencies; an interactive portal or gateway Web presence with limited transactions; a transactional Web presence that allowed for all types of secure transactions; and a seamless Web presence where a user could log in into one central portal system and access multi-governmental responses [Garson 2006; Ho 2002; United Nations and American Society for Public Administration 2002]. It is important to note that these stages are typically evolutionary in nature. That is, a government usually first uses their Web site to just offer information to citizens. Then, as time progresses, technology improves and citizen demand for online governmental services increases, and governments use their Web site to offer more and more services. The last stage of Web site development, which exists in a variety of forms in many governments, allows the citizen to login to one portal system and access a variety of governmental services across agencies and across levels of government.

In this initial classification of government Web sites, the emphasis was mainly on online services and how governments could take advantage of online transactions to become more efficient and increase citizen/customer satisfaction. Darrel West [2005] later modified this classification schema when he examined a number of governmental Web sites in an attempt to categorize e-government activity, defined as how governments and public organizations use online media to provide basic information, deliver public services, and help citizens engage and participate in their government. He determined that four stages of government Web sites existed: billboards, partial service-deliveries, portals, and interactive democracy [West 2005]. In the billboard stage, governments only use their Web sites to communicate information to citizens. These are basic governmental Web sites commonly found in smaller local governments, single purpose governments, and some legislative entities. In the partial service-delivery stage, Web sites typically have more interactivity with advanced search functions and a limited number of online services. Expanding on the partial service-delivery stage, a portal type of Web site allows government to offer a variety of services online. All a citizen has to do is log in into the portal and then the citizen can perform a variety of activities from ordering governmental publications, paying a governmental fine or fee, and communicating directly to policymakers and bureaucrats. However, while all of these latter stages make some service delivery more convenient for citizens and more efficient for government, they do not really transform the way citizens interact with their government.

Instead, the transformational power of e-government begins to take shape in the final stage of the governmental Web site: interactive democracy. With an interactive democracy Web site, a citizen can directly participate in governmental decision-making and directly hold policymakers and bureaucrats accountable on a variety of decisions [West 2005]. In this way, interactive democracy Web sites place more emphasis on public feedback and democratic deliberation instead of service delivery. Although, it should be noted that interactive democracy websites would also have a good deal of services online for citizens to access. While it is debatable if any governmental Web site has truly reached the final stage of interactive democracy, many Web sites are slowly progressing to this point. For example, many federal agencies have added an e-rulemaking component to their Web sites allowing citizens to input comments on draft agency rules and monitor how these comments

influenced the final rules promulgated by the agency [Shulman 2005]. When government integrates this type of citizen input with more accountability-based features such as how the promulgated rule impacted agency performance, then an interactive democracy Web site has occurred.

Today, most Web sites are either at the partial service delivery stage or the portal stage of e-government. The interactive democracy stage has not been reached in most governments, but presumably will occur as citizens demand more online participatory opportunities from their governments. However, in order to reach this transformative stage, a number of hurdles will have to be overcome. Many of these hurdles will be politically based because some policymakers may not want to encourage democratic participation and deliberation through a Web site [West 2005].

Many of the hurdles will also be financial. In an era of budget cuts for all levels of government, policymakers may deemphasize the importance of expanding governmental Web sites in this way simply because of financial constraints. However, the most significant hurdle may well be related to performance mandates. In order for citizens to engage in interactive democracy, they have to learn how well their government performed in the delivery of services. And to learn how well programs and agencies performed, a number of statutory, data, and technical challenges have to be solved. The remaining portion of this chapter focuses on these types of challenges and offers solutions to overcome them so that performance data from different performance mandates can be better integrated onto one government Web site to help achieve a higher level of citizen engagement.

27.3 The Statutory Challenge

The primary challenge of better integrating performance data onto governmental Web sites is statutory in nature. Due to the heavy emphasis on the New Public Management ideal of performance measurement since the 1990s, most governments are now under a variety of disparate performance statues that require them to collect or to be assessed on a variety of different performance measures. The purpose of these assessments is to make government better by mandating the measurement of governmental results and more accountable by linking performance assessments to budgetary decisions. The underlying idea is that if an agency's or program's performance is measured, then managers will be able to identify areas where program services need improvement. Similarly, policymakers and budgetary officials can examine the same performance data and determine whether the program deserves continued funding.

However, the use of these performance assessments has never really approached that ideal. Instead, the use of performance measurement is typically seen as being a very unsatisfying and subjective process for both bureaucrats and policymakers [Gilmour and Lewis 2006]. One of the reasons for this outcome is that different performance mandates placed on agencies and programs often result in uncoordinated performance measurement. Uncoordinated performance measurement places severe limitations on the integration of performance data onto a government Web site. No better example of this exists than at the federal government.

27.3.1 Major Federal Performance Measurement Statutes in the 2000s

At the end of 2008, federal agencies operated under three major performance measurement statutes: the Government Performance and Results Act (GPRA), the Executive Branch Management Scorecard (also known as the Scorecard Initiative), and the Program Assessment Rating Tool (PART). Numerous other performance mandates exist in the federal government. For example, federal agencies have to abide by specific information technology performance mandates in the

Federal Enterprise Architecture initiative and the Clinger–Cohen Act [Rocheleau 2006; White 2007]. However, GPRA, PART, and the Scorecard Initiative are the current performance mandates in the federal government that have the broadest performance measurement impact across programs, agencies, and type of activity performed by government. Therefore, this chapter will examine these mandates in more detail to determine how data from different types of performance mandates can be integrated on one Web page.

The GPRA is the oldest assessment of the three and in many ways the most generalized. With input from both Congress and the President, GPRA was signed into law in 1993. It required all agencies to link performance results with agency goals and objectives through the development of strategic plans, annual performance plans, and performance results [Moynihan, 2008]. Policymakers designed GPRA as a way to make agencies engage in annual strategic planning, help coordinate resources, and make agencies develop and showcase their performance results. The idea behind GPRA was relatively simple: Agencies had to start crafting annual strategic plans and then show with performance data how they were implementing those plans [Radin, 2006].

The PART and the Scorecard Initiative are newer assessment tools initiated by the Bush administration in 2002, but early indications are that the newly elected Obama administration will also keep at least some sections of these assessment tools in place [Mosquera 2009]. The PART focuses on programs and emphasizes the use of measures that evaluate how well a specific program is performing and how efficiently it is operating. The Scorecard Initiative focuses on agencies, and it tracks on a quarterly basis how well an agency implements the President's management agenda in human resource management, privatization, financial reporting, electronic government, and performance and budget integration [Breul, 2007].

The Bush administration announced the PART performance assessment in 2002 and first implemented it in 2004. In the PART process, the Office of Management and Budget (OMB) asks each program a series of standard questions related to programmatic purpose, planning, management, and the achievement of results. Specific questions based on program services can also complement these standard questions [Breul, 2007]. From these questions, OMB generates a PART score for each program assessed. The PART scores are divided into four sections. In each section a program can receive a score from 0–100 points. Additionally, each section has a specific set of weights that result in a final cumulative PART score for the program. The four sections include:

1. Program Purpose and Design: Scores reflect whether the program has a clear purpose and if the program is designed to meet that purpose (20%).
2. Strategic Planning: Scores reflect if the program's agency has established suitable annual goals and long term goals for its programs (10%).
3. Program Management: Scores indicate whether the program has good management, including appropriate financial oversight controls and program improvement methods (20%).
4. Program Results: Scores indicate if the program is achieving performance results according to strategic planning goals (50%).

After scores are calculated for each section, the scores are weighted in a final calculation to reflect 20% for program purpose and design, 10% for strategic planning, 20% for program management, and 50% for program results. The final PART score is thus a percentage-based score from 0 to 100% (with 100% reflecting the top score). However, OMB does not report this final PART score. Instead, they typically report scores for each section and then categorize final scores as: *ineffective* (final PART scores between 0 to 49%); *adequate* (final PART scores between 50% to 69%); *moderately effective* (final PART scores between 70% to 84%); and *effective* (final part scores

between 85% to 100%). Unlike other federal performance assessments, the PART process is not annualized. Instead, approximately 15% to 25% of programs are assessed or re-assessed in any one year by the OMB. As a result, only by the end of 2008 had OMB performed the PART assessment (also known within the federal government as being "PARTed") for every program.

In the Scorecard Initiative, officials from the OMB assess each agency every quarter on how well they follow the President's management agenda in 5 specific objectives: (1) enhancing the strategic management of human resources; (2) increasing the use of competitive sourcing in service delivery (later renamed commercial services management); (3) using appropriate financial reporting tools to control agency resources; (4) improving the use of electronic government tools; and (5) integrating PART performance results with funding decisions [Bruel 2007; Office of Management and Budget 2008]. Scorecard ratings for each agency reflect a traffic light pattern for each objective, with green scores indicating success in implementing that portion of the President's management agenda, yellow scores indicating mixed results, and red scores indicating unsatisfactory results for the quarter under review.

27.3.2 Implications of the Statutory Challenge

Each of these mandates has an explicit statutory purpose. The GPRA has the underlying goal of having agencies measure their performance in relation to achieving their strategic plan. The PART has the goal of making sure that programs, not agencies, can measure their performance. And the Scorecard simply measures the performance of agencies on a small set of presidential objectives that presumably make the government more efficient and effective. The challenge facing the federal government, as well as many state and local governments with disparate performance statutes, is how to integrate these performance measurements into one governmental Web presence so that an effective diagnostic tool for performance can emerge. Because these performance mandates are different in statutory purpose, there will be resistance to integrating them in one Web presence. Yet, if that integration can occur, a good diagnostic tool for performance could emerge.

With integration, the disparate performance measures could be used in new ways to diagnose greater organizational pathologies. For example, if these three different performance measurements were integrated on one Web site or on one internal system, then citizens, policymakers, and bureaucrats could easily examine whether programs with a low PART score originate from agencies with a lower Scorecard score. In this way, integration increases the usability of data for citizens.

Currently, this integration is not occurring. These three performance mandates each have their own distinct governmental Web presence. The GPRA has the most disorganized Web presence. No single GPRA Web site even exists where a citizen, bureaucrat, or policymaker can view the agency planning documents and performance measures as required by the statute. Instead, these documents and measures exist in a variety of locations on the Web sites of federal agencies. This makes finding and using performance data from GPRA very difficult. The OMB Scorecard and PART both do a better job in that each of these performance mandates have a specific Web site that lists performance data (see http://www.expectmore.gov for PART and http://www.results.gov for the OMB Scorecard). However, the performance data is not integrated across mandates. As a result, the data from one performance mandate cannot be directly analyzed in comparison to another performance mandate on the same Web page.

These three Web presences reveal the ultimate outcome of the statutory challenge. Due to the fact that each of these performance mandates serves a different purpose and has a different goal, there is great resistance to integrating them on one Web page. Yet, if integration occurred, a new richness to the data would result. This could help bureaucrats or policymakers diagnose

organizational dysfunctions, and it could also help citizens better understand why one program or service is not performing as well as another type of program or service.

27.4 Data Challenges

Integration of disparate performance measurement statutes onto one government Web page is often easier said than done. This is because each performance mandate usually has its own specific type of data. Thus, the next set of challenges that must be overcome in order to better integrate different performance data onto one government Web page is data driven.

In most performance mandates, data can be categorized into two broad classes: quantitative data and qualitative data. Quantitative data is numerical in nature. As a result, a software program can easily manipulate quantitative data points with a variety of mathematical operations. However, in order for the data manipulation to make any sense, the quantitative data must be measured in the same way. For example, it makes logical sense for a system to integrate budgetary amounts from different types of programs as long as the budgetary amounts are all measured in the same way.

In most performance mandates in government, quantitative data is either in the form of inputs, outputs, or efficiency measures. Input measures are simply a quantifiable representation of how much of something is invested in a program or agency so that the service can occur [Hatry 2006]. In most governments, the most common input reported is the amount of funding the program or agency received. However, other inputs such as the number of personnel involved in the service, number of hours devoted to the service, or some measure of some other resource are also common [Kelly and Rivenbark 2003].

Output measures are a count of how much of something a program or agency produced during a set amount of time [Poister 2004]. For example, in many local governments the common output measures for a police department could be the number of criminals arrested during a fiscal quarter. Because output measures are not easily comparable between different types of programs or agencies, efficiency measures are sometimes produced by comparing the output measure to the input measure [Hatry 2006]. This reflects how much service is being produced by the program or agency given the amount of input going into the program or agency.

In many performance mandates, these types of quantitative data sources often play the predominant role in performance assessments since they can be so easily manipulated in a data system. However, qualitative measurements are also important when discussing outcome based measurements. Qualitative measurements are typically textual in nature rather than numerical. As a result, automatic data manipulation by software systems is somewhat limited. Nonetheless, qualitative measurements often provide a rich description that explains the ultimate outcome of the inputs used and the outputs achieved [Posavac and Carey 2003]. These outcome-based measurements show whether the program or agency made a difference when they delivered the service.

27.4.1 Solving Data Challenges

While a key challenge to integrating data from different mandates in one Web page is the variation in data types being collected, the task is not impossible. For instance, although input, output, outcome, and efficiency measures might be different from performance mandate to performance mandate and from program to program, a Web page could still present the data categorized by data type. In this way, citizens and policymakers could compare and contrast differences in the inputs going into various programs, what the programs actually achieved in terms of outputs and

outcomes, and how efficiently the programs achieved those outputs and outcomes. The benefit of this type of integration is that allows for a direct comparison of performance on one Web page.

Other solutions to the data challenge include analyzing performance trends for each performance mandate over time. In this way, trends between different mandates and different programs could be easily compared on one Web page. For the three federal performance mandates currently in use, this could include establishing a Web page where the performance trends for GPRA measures, PART measures, and the OMB Scorecard are directly compared. This would allow the user to determine whether performance trends are increasing for the GPRA measures and decreasing for the PART measures. Such a finding could lead an agency to determine what it is doing well and what it is doing poorly.

27.5 Technical Challenges

Lastly, in order for performance integration to occur on one Web site, certain technical challenges have to be solved. The major technical challenges involve either establishing a database system for each performance mandate or establishing a newer performance system that can simply collect the performance data from existing databases and showcase it on an integrated Web site. In either option, a performance database is integral to the process because the quantitative or qualitative data has to be continually updated on the integrated Web page to reflect the current performance of programs or agencies. Often, these performance databases already exist in government in the form of ERP software systems. However, most proprietary ERP systems such as databases from Oracle or SAP have two major disadvantages: cost and usability.

An example from the state of Arkansas illustrates these disadvantages. From 2000 to 2002 the state of Arkansas spent over $60 million dollars for a proprietary ERP system that integrated several governmental functions in one online environment [Songini 2005]. This system represented an expensive and expansive overhaul of existing personnel, accounting, and budgeting software previously used by the state. Due to a variety of problems with the implementation of this system, the state of Arkansas ultimately spent approximately $30 million more dollars than initially estimated for the system [Songini 2005]. In addition, the project as a whole missed deadlines, had ineffective training sessions for end users (namely, the state bureaucrats who would use the system), and did not function correctly on its first day of operation [Songini 2005]. The resulting impact was an online proprietary software system that was over-budget, delayed, and ineffective at using an online environment to enhance governmental efficiencies and functionalities.

To help minimize cost, governments and other types of public organizations may want to start using public license software (also known as open source software) instead of proprietary software when integrating services in an online environment. Public license software offers a number of advantages over proprietary software. First, the financial cost of purchasing public license software is either very low or non-existent. In a typical arrangement, public license software applications are offered for free. The only times that financial costs are incurred are (1) when the end-user has to pay for the physical distribution of the software within their organization (e.g. the cost of postage or the cost of a CD or DVD); and (2) when the end-user purchases an application that has been adapted by a computer programmer from the existing computer code of a public license software application. This second cost actually illustrates a second advantage of public license software: the computer code of public license software is in the public domain.

When an end-user such as a government adopts a public license software application, the computer code behind the application is easily accessible. This allows government information

technology specialists to adapt public license software applications to better fit their needs. In contrast, the computer code behind proprietary software applications is not accessible and cannot be altered by the government information technology specialists. As a result, the government has to depend on the company selling the proprietary software to make the necessary code changes to adapt the system to fit their needs. This can add significant financial costs to the implementation of the system [Weber 2004]. In addition, the copyright provisions governing public license software even allow the government to sell the adapted software application for a financial profit [GNU General Public License 2007]. The only requirement is that the newly adapted computer code must continue to be available to the users who purchased it. This allows for the further refinement of the application by different end-users.

Third, most public license software applications are well known by information technology specialists. In fact, many information technology specialists use public license software applications, such as the Linux operating system or the mySQL database system, as learning tools that allow for an expansion of design and programming ability. As a result, most information technology specialists are probably familiar with the basic specifications of many public license software applications. This familiarity can help information technology specialists to more easily implement public license software applications in an organization or help them adapt the code of public license software applications to better fit their organization's needs.

To be sure, public license software is by no means a panacea for government. Implementation costs, appropriate training for all staff, and emerging security concerns can also certainly plague public license software applications just as they plague proprietary software applications. In addition, many public license software solutions will probably not have a suite of advanced options or a stylish graphical user interface (GUI) that can enhance an end-user's experience and are typical of many proprietary software systems in use today. However, the very low cost of public license software seems to minimize some of these issues. As a result, if it can be implemented in an organization, public license software may have an advantage over similar proprietary software systems solely because of the financial cost factor.

27.6 Conclusion

This chapter examined the common challenges of integrating disparate performance information onto a governmental Web site. While this chapter used the federal performance mandates of GPRA, PART, and the OMB Scorecard as an example to show how the data generated from different performance mandates can be different, the challenges presented should also apply to state and local governments, because these governments usually have some type of performance measurement system similar to these three federal mandates [Willoughby and Melkers 2001; Melkers and Willoughby 2005]. Using the strategies contained in this chapter, programs and agencies at all levels of government should be able to integrate various performance data streams onto one coherent governmental Web site. Without such integration, policymakers, bureaucrats, and citizens are left with a variety of performance measures that often do little to make government better. However, when combined on one Web site, different performance measures can reveal a richer detail of data that can help diagnose organizational dysfunctions and also help to increase citizen knowledge and accountability of their government. In this way, developing a single Web page for disparate performance data helps to continue the evolution of governmental Web sites from just billboard sites with basic information to Web sites that promote enhanced accountability from citizens.

References

Behn, R. D. 2007. The challenge of evaluating m-government, e-government, and p-government: What should be compared with what? In *Governance and information technology: From electronic government to information government*, ed. V. Mayer-Schonberger and D. Lazer, 215–238. Cambridge, MA: The MIT Press.

Blalock, A.B. and B. S. Barnow. 2001. Is the new obsession with performance management masking the truth about social programs. In *Quicker, better, cheaper: Managing performance in American government,* ed. D. W. Forsythe, 485–517. Albany, NY: Rockefeller Institute Press.

Breul, J. D. 2007. Three Bush administration management reform initiatives: The President's management agenda, freedom to manage legislative proposals, and the program assessment rating tool. *Public Administration Review* 67: 21–26.

Fountain, J. E. 2001. *Building the virtual state: Information technology and institutional change.* Washington, DC: Brookings Institution Press.

Fountain, J. E. 2002. Toward a theory of federal bureaucracy for the twenty-first century. In *Governance.com*, ed. E. C. Kamarck and J. S. Nye Jr., 117–140. Washington, DC: Brookings Institution Press.

Garson, G. D. 2006. *Public information technology and e-governance: Managing the virtual state.* Sudbury, MA: Jones and Bartlett Publishers.

Gilmour, J.B., and D. E. Lewis. 2006. Does performance budgeting work? An examination of the Office of Management and Budget's PART scores. *Public Administration Review* 66: 742–752.

GNU General Public License. 2007. GNU general public license, version 3. Available at: http://www.gnu.org/licenses/gpl.txt (accessed January 15, 2009).

Hatry, H. P. 2006. *Performance measurement: Getting Results*, 2nd ed. Washington, DC: The Urban Institute Press.

Ho, A.T. 2002. Reinventing local government and the e-government initiative. *Public Administration Review* 62: 434–444.

Kelly, J.M. and W.C. Rivenbark. 2003. *Performance budgeting for state and local government.* Armonk, NY: M.E. Sharpe.

McNeal, R., K. Hale, and L. Dotterweich. 2008. Citizen-government interaction and the internet: Expectations and accomplishments in contact, quality, and trust. *Journal of Information Technology and Politics* 5: 213–229.

Melkers, J. and K. Willoughby. 2005. Models of performance-measurement use in local governments: Understanding budgeting, communication, and lasting effects. *Public Administration Review* 65: 180–190.

Mosquera, M. 2009. CPO pick signals emphasis on accountability. *Federal Computer Week*, January 12, 2009. http://fcw.com/articles/2009/01/12/cpo-pick-signals-emphasis-on-accountability.aspx (accessed January 15, 2009).

Moynihan, D. P. 2008. *The dynamics of performance management: Constructing information and reform.* Washington, DC: Georgetown University Press.

Office of Management and Budget. 2008. Memorandum for the President's Management Council: Plans for commercial services management. (July 11). http://www.whitehouse.gov/omb/procurement/comp_src/plans_commercial_services_mgmt_071108.pdf (accessed January 15, 2009).

Osborne, D. and Gaebler, T. 1992. *Reinventing government: How the entrepreneurial spirit is transforming the public sector.* Reading, MA: Addison-Wesley.

Poister, T. H. 2004. Performance monitoring. In *Handbook of practical program evaluation*, 2nd ed., ed. J.S. Wholey, H.P. Hatry, and K.E. Newcomer, 98–125, San Francisco, CA: Jossey-Bass.

Posavac, E. J. and R. G. 2003. *Program evaluation: Methods and case studies*, 6th ed. Upper Saddle River, NJ: Prentice Hall.

Radin, B. A. 2006. *Challenging the performance movement: Accountability, complexity, and democratic values.* Washington, DC: Georgetown University Press.

Rocheleau, B. 2006. *Public management information systems.* Hershey, PA: Idea Group Publishing.

Roy, J. 2007. E-government in Canada: Transition or transformation? In *Current issues and trends in e-government research*, ed. D.F. Norris, 44–67. Hershey, PA: Cybertech Publishing.

Schulman, S. W. 2005. E-rulemaking: Issues in current research and practice. *International Journal of Public Administration* 28: 621–641.

Seifert, J. W. and J. Chung. 2009. Using e-government to reinforce government-citizen relationships: Comparing government reform in the United States and China. *Social Science Computer Review* 27: 3–23.

Songini, M. 2005. Arkansas set to pull the plug on ERP-driven budgeting approach: State moves to scrap performance-based methodology; lawsuit continues against SAP over initial software rollout. *Computerworld*, 7 February, 2005. http://www.computerworld.com/softwaretopics/erp/story/0,10801, 99578,00.html (accessed January 15, 2009).

Swain, J. W. and J. D. White. 2005. Public finance management information systems. In *Handbook of public information systems,* 2nd ed., ed. G. D. Garson, 489–504. Boca Raton, FL: CRC Press.

United Nations and American Society of Public Administration. 2002. *Benchmarking e-government: A global perspective assessing the UN member states.* Washington, DC: American Society for Public Administration and the United Nations.

Weber, S. 2004. *The success of open source.* Cambridge, MA: Harvard University Press.

West, D.M. 2005. *Digital government: Technology and public sector performance.* Princeton, NJ: Princeton University Press.

White, J.D. 2007. *Managing information in the public sector.* Armonk, NY: M.E. Sharpe.

Willoughby, K.G. and J.E. Melkers. 2001. Performance budgeting in the states. In *Quicker, better, cheaper: Managing performance in American government*, ed. D.W. Forsythe, 335–364. Albany, NY: Rockefeller Institute Press.

Chapter 28

Information Systems, Accountability, and Performance in the Public Sector: A Cross-Country Comparison

Rebecca L. Orelli, Emanuele Padovani, and Eric Scorsone

CONTENTS

28.1 Information Systems, Accountability, and Performance

If we ask a taxpayer what he or she expects from his or her government, likely the answer would involve public resources being used in a responsible and transparent way to provide valuable services. These two concepts also represent two pillars around which public management disciplines have concentrated their research in the last two decades. In the following sections, we briefly define the notions of accountability and performance in the public sector and then we discuss their linkages to the information systems.

28.1.1 Definition of Accountability

Accountability can be defined as the "relationship in which one party, the *accountor*, recognizes an obligation to explain and justify their conduct to another, the *accountee*." [Pollitt 2003, p. 89]. Generally speaking, accountability is a requirement of each individual's participation in any social world [Willmot 1996]. With reference to public administration, it is seen as a key mechanism in the nature of democratic governments. Decision makers, both elected and unelected, are given the power to decide on the allocation of resources, regulatory rules, and other governmental tools of power while being held "to account" for their behavior. According to Romzek and Dubnick, "public administration accountability involves the means by which public agencies and their workers manage the diverse expectations generated within and outside the organization" [Romzek and Dubnick 1987, p. 233].

The concept of accountability represents the underlying logic of any New Public Management-style governments' reform around the globe [Hood 1991; Osborne and Gaebler 1992; Guthrie et al. 2005], and considers a wide array of key elements that have been accumulated through the various definitions given over time by different scholars. Among others, we can list the following:

- The explanation about the way resources are used [Roberts and Scapens 1985];
- The focus on performance measurement and standards [Hood 1991];
- The need for definition of accounting and reporting principles [Patton, 1992];
- The raising of moral and ethical dimensions [Pallott 1992];
- The tight relationship with the concept of "responsibility" and "sanction" [Pollitt 2003];
- The variety of stakeholders involved, both within and outside government and within and outside each single organization, with adversarial needs and perspectives [Hoek et al. 2005].

The latter dimension highlights that accountability in the public sector is a relationship that might happen between:

1. Two governmental organizations;
2. One governmental and one non-governmental organization or individual (or group of individuals);
3. Within one governmental organization, between different actors.

The first situation refers to what is known as intergovernmental relationship. By intergovernmental setting, the reference is being made to a higher level government (principal government) mandating or providing the discretionary authority to a lower level government (agent government) to provide a service (what we can call "vertical" intergovernmental relations), or to

entities of the same level of government that jointly cooperate into shared programs ("horizontal" intergovernmental relations). Across the world, the decentralization of government services has been pushed as a major theme of New Public Management [Hood 1991]. All manner of services are now being provided by state/provincial governments at the behest of national governments or local governments at the behest of state/provincial or national governments. Also, the creation of consortiums, associations, and other forms of collaboration among the same level of government (especially at the local level) as it has recently happened, has provoked a fragmentation of responsibilities and activities among several entities for the same purposes and programs, burgeoning accountability relationships.

The second setting is usually in place when either a non-governmental organization or an individual (or group of individuals) is considered an accountee for a governmental organization. Governments may be accountable to a variety of non-governmental organizations such as environmental associations, unions, enterprises associations, and non-profit organizations, which represent specific categories of citizens' interests (e.g., handicapped, retired, borough communities). Individuals are usually referred to the generic idea of citizen or customer. Sometimes an individual is both citizen and customer at a time—for example, when a resident rides a bus in his or her town or when he or she uses the local public library. In several other instances customers differ from citizens. For example, many customers of a mass transit system of a large metropolitan area like New York City are not citizens of the same jurisdiction, and not all citizens of a specific local government are also customers of local schools, even if they subsidize the service through their own property taxes. While intergovernmental relationships can be easily known (through norms, contract, laws), the problem of actual "non-governmental" stakeholder identification is yet unresolved by academic research and, even if some conclusions were recently drawn, subjective judgment still remain central [Achterkamp and Vos 2007].

Accountability relationships also occur within a governmental organization and among different actors. In this case, accountability basically overlaps with administrative procedures and planning and control activities, among which management control plays a dominant role. Administrative procedures represent the *modus operandi* of bureaucracies intended to guarantee equity and transparency. Usually, an administrative procedure is stated by law or internal rules. Management control derives from a more recent introduction of managerial theories within the public sector context. According to prevailing managerial disciplines, the aim of management control is to increase the probability that program formulation and implementation by the organization accomplish strategic goals, minimizing costs. To do this, management control acts through a system of tools based on performance measurement to hold managers responsible for their actions [Anthony and Young 2003].

The accountability literature has focused on classifying the different types of frameworks in place by governments to control and provide justification for government actions. Romzek and Dubnick [1987; 1991] have conceptualized four types of accountability mechanisms, depending on the source of agency control—internal or external—and the degree of control over agency actions—high or low. When the relationship between the accountor and the accountee is hierarchical within the same organization and the degree of control—in terms both of range and depth of actions—is high, a bureaucratic accountability mechanism is in place. The bureaucratic accountability system is characterized by the top-down relationship, which is between a superior and a subordinate, in an environment where supervision activities, operating procedures, and rules and regulations are in place to control a wide span of activities.

Legal systems are used as an accountability mechanism that is external but the level of control remains high. In this case, a wide range of activities are controlled by actors outside the boundaries of the organization who can impose, through legal sanctions or contracts, their priorities and standards. This is the case, for example, of the impositions of standards and administrative procedures by state or regional governments to municipal communities for services that are funded by the former but are operated by the latter.

The professional accountability approach is typically associated with the degree of complexity or difficulty of a given activity. Public officials rely on experts who are hired to study specific problems (i.e., internal source of control). These experts have, therefore, the power to impose their views over the organization, but the degree of control is lower than in the bureaucratic accountability.

Finally, political accountability refers to the relationship between constituents and representatives—the latter being responsive to constituents, given their policy priorities and programmatic needs. Thus, the source of control is external (constituents) but the level of control is lower than in the legal accountability setting (see Figure 28.1).

28.1.2 Definition of Performance in the Public Sector

Despite the massive research on how to measure performance, to implement and use performance measurement systems, to compare performance, there remains a surprising lack of clarity on the core notion of "performance" itself. Many books and articles on performance measurement actually do not identify or define the concept of "performance" in and of itself.

Performance measurement is set around the idea that each public organization formulates its own envisaged performance by defining specific performance indicators which are used to steer and control activities with the aim of attaining strategic goals [De Bruijn 2002]. Hatry defines performance measurement as the "measurement on a regular basis of the results (outcome) and efficiency of services or programs" [1999, p. 3]. Bovaird [1996] consider performance as "not a unitary concept … [which] must be viewed as a set of information about achievements of varying significance to different stakeholders" [1996, p. 147]. This brings to the question of what are defined as "achievements." Achievements may be viewed as a synonym for results, which is the most typical view taken by many practitioners from the performance measurement movement.

An alternative route for a definition of performance may be to use classification or typology systems to understand different types of performance. In fact, the notion of multidimensional performance is widely accepted. Typically, the classification of performance into different categories such as inputs, process, outputs, and outcomes is the most important distinction made

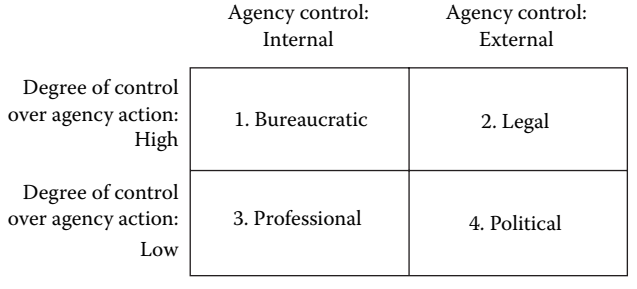


Figure 28.1 Types of accountability systems, (Adapted from Romzek, B. S. and M. J. Dubnick, *Public Administration Review* 47, 229, 2007.)

in the field, but there are a considerable number of variants [see Farneti et al. 1996; Hatry 1999; Anthony and Young 2003; Poister 2003]. Inputs are referred to as the most typical form of performance measurement as they evaluate the various types of resources. Inputs can be assessed either using their own natural measurement units (such as the number of employees used) or using their monetary value (total personnel costs). Processes measures relate to activities carried on by an organization, such as the number of documents processed in a day, the number of potholes repaired during winter, etc. While process indicators are means oriented, output measures are ends oriented and are related to an organization's objectives. For example, typical output measures are metric tons of trash collected, number of children enrolled in municipal kindergarten, number of patients subject to treatments in a hospital, number of passengers in a mass transit system in a year. Besides quantitative aspects, output can also be measured in relation to its quality using such indicators as level of quality perceived by customers or number of non-compliances in a quality assurance plan. Outcomes are numerical measures that focus government managers, politicians, and citizens on the results or achievements of government programs or policies. In other words, they measure the intended impacts on society at large provided by the outputs, which generally relate to aspects of the quality of life. Typical illustrations are concentration of dangerous effluents (e.g., carbon dioxide, ozone, etc.) in the air, suicide rate, travel times, crimes rate, etc. From these elementary performance components, two main concepts are created: efficiency, as the ability to minimize inputs given a certain level of outputs or maximize outputs given a certain amount of inputs; and effectiveness, as the ability to achieve the goals or standards provided.

Performance can also be defined at different levels in a governmental system. It may be defined at the organizational level or the bureaucratic system. Even at the organizational level, one may view performance from the standpoint of the bureaucracy or the political level. Alternatively, performance may be defined as the individual employee level which is perhaps more typical in the human relations management field [Talbot et al. 2007]. This would be the case of individual performance appraisals. In between, policy arenas or programs may be the loci of the performance discussion. From an external perspective, the focus on the different dimension of performance is driven by the different stakeholders' interests. With specific reference to the traditional categories of performance illustrated above, some measures are more attuned for certain kinds of audiences and not for others. For example, managers might be more involved in input, process, and output measures, while output and outcome measures could be more relevant for the political and citizens' level.

Both the administrative and managerial sciences agree on the need to understand performance measurement, and, thus, the core notion of "performance" in the public sector in a dynamic or evolving context [Pollitt 2007; De Bruijn 2002]. Thus, the challenge is to move in handling this dynamism. For example, certain external forces or factors may drive changes in the types of performance measures being utilized moving from an input-based system to an output-based system with emphasis on productivity and efficiency. Pollitt [2007] posits that several factors may influence the change in a performance measurement system over time. One factor he and his colleagues cite is the linkage between the performance measurement system and managerial or political activities. Over time, for example, as politicians learn of the performance measurement system, they may signal that certain indicators should be used or collected instead of others to suit their purposes. Their research also points to the fact that crises can motivate both the birth and refinement of performance measurement systems. A final important finding is that, particularly when viewed over time, performance measurement systems are likely to appear to be inconsistent and even lack data validity and reliability, as compromises among stakeholder interests are met in developing and implementing such a system.

In explaining how and why the performance concept is volatile in the public sector, we can use the "performance regime" concept by Talbot and co-authors [Talbot et al. 2005; Talbot 2006]. They suggest that a multitude of actors may be involved in defining the context within which a government may be engaged in developing and adopting a performance measurement system, thus shaping the prevailing idea of performance that has to be accomplished. The authors define some of the important institutional actors to include government departments, line ministries, legislatures, audit, inspection and regulatory bodies, judicial bodies, professional institutes, and users. Each of these actors, who, in a sense, can be considered stakeholders, may have the power to shape the type and impose the use of performance measures within the entire, or only certain functional areas of, local government. In fact, Talbot and co-authors define a regime in terms of which principal agencies or organizations are driving the adoption of "performance measures, targets, etc…" [Talbot 2006, p.13]. For example, the national government could act as one of the central actors in determining the performance measurement system for local government via the requirement of mandatory performance measurement systems, as has happened under the Best Value program in the United Kingdom since 2000 [Bovaird and Halachmi 2001]. In Italy, the independent regional branches of the Court of Audit—the constitutional body that safeguard public finance, efficiency, effectiveness and economy through auditing—act as one of the most important actors in the definition of performance indicators used at the local level [Battini 2007].

28.1.3 How Information Systems May Affect Accountability and Performance

Programs of government do not work by themselves [Miller and Rose 1990]; they require "technologies" if they are to be made operable. Technologies are devices for intervening [Hacking 1983], and they include notation, computation and calculation, procedures of examination and assessment, etc. Today, they can be identified with information technologies (IT). Using the brief discussion above as a starting point, there is a strong case that can be made that IT systems should be viewed within the context of an accountability and performance framework in the public sector.

First of all, it is evident that accountability relationships are multiple and sometimes—especially for external actors—indefinite. Therefore, IT systems can help governments in being flexible and speeding up accountability relationships. Second, information systems may allow such sophistication as business intelligence tools, not only to make more rational decisions but also to give the opportunity to present information about the way resources are used tailored to the different stakeholders involved. Third, an information system is the only possibility governments have to deal with the variability of performance definitions across different actors. Fourth, information systems, especially when directed towards the external environment, can be seen as a new aspect of performance *per se*. In other words, it is not a substitute of other services, but it is a new, distinctive service. It can be affirmed that, under a performance regime approach, the (growing) Internet community has pushed toward the adoption of information systems in governments.

Given the conceptual frameworks presented, it can be argued that three dimensions seem to be important when IT is studied with reference to accountability and performance. The first dimension to be analyzed is the *nature of the accountability relationship* in crafting and deploying a government IT system. In other words, the source of the "account giving" in an IT system may be, according to Romzek and Dubnick [1987; 1991], political, legal, bureaucratic, or professional. Each of these sources will have different criteria and sets of data and information they expect from such a system and place different demands on the IT system.

The second dimension to be analyzed is the *level of government and types of external stakeholders involved*. For example, a government Web site may be developed with the input of a citizen's advisory committee. Or different levels of government, for example local and state governments, may interact with the federal or central government to shape IT system deployment and in particular Web site deployment. This dimension can be referred to what has been presented as "performance regime" earlier [Talbot 2006], in other words, the actors who shape the concept of performance that has to be provided by information systems.

The third dimension is the *types of performance* for which information systems is intended to accomplish. Information systems offer different services or information to citizens, other governments, contractors, or internal managers via the IT system. Each group will, of course, bring their own demands of output on the system. Web site or e-government information could include items such as how the government is structured, how laws are passed, and other basic government information. It could also include access to direct services, such as obtaining a drivers license or building permit, or having access to bus or train schedules. For internal managers, they may desire access to payroll and human resource data, budget and spending data, and other real time operational measures. Each group will make different demands via the IT system. Overall, information systems implementation strategies may be focused more on: (1) efficiency gains, i.e., producing the same outputs at lower total cost, producing more outputs at the same total cost, or producing the same outputs at the same total cost in less time; (2) effectiveness gains, i.e., producing the same outputs at the same total cost in the same time, but to a higher quality standard, or producing new outputs [Hammers Specht 2000; Worrall et al. 2000; Heeks 2001; Hammers Specht and Hoff 2005].

All three of these dimensions described here will be used to categorize the strategies adopted in the cases analyzed.

28.2 Information System Development in the Public Sector

Over the past decades, there has been a significant evolution in the public sector information systems. To shed light on such development in Europe, an overview of the development of public information systems in the public sector is presented. After having described the evolution of information systems and information technology in the last 20 years in Europe and the United States, there will be taken in to account the current strategies and actors in Europe. Here, each country adapts the European strategies to its particular context. With the aim to explain the process of adoption, adaptation, and the results achieved, and their logical correlation with strategies, type of accountability, and level of performance, we consider it particularly instructive to consider two different national cases in terms of results achieved. This comparison, we argue, will constitute the basis for the discussion in section 28.3 about the influence of information systems, and in the particular case of e-government, on accountability and performance.

28.2.1 The Evolution of Information Systems in Europe and the United States

In the last 20 years, many Organization for Economic Coordination and Development (OECD) countries have responded to the Information Age challenge by developing plans for reengineering governments with information systems [Hood and Margetts 2007]. Several international organizations, such as OECD itself, the European Union's Information Society Initiative, the

G7 Government Online Project, and the International Council for Information Technology in Government Administration, promoted those initiatives. Since the late 1990s, the main attention of the European countries and United States has been focused on e-government. E-government is typically defined as providing government services, such as licensing, permit applications and other government information, via the Internet or other technologies to citizens and businesses [Chen and Gant 2001]. It is about using the tools and systems made possible by Information and Communication Technologies (ICTs) to provide better public services to citizens and businesses. It is mainly concerned with providing quality public services and value-added information to citizens. It has the potential to build better relationships between government and the public by making interactions between citizens and government agencies smoother, easier, and more efficient. Existing e-government offerings actually go beyond merely facilitating or transforming the interaction between government and individual citizens. E-government serves a variety of other actors. For instance, some e-government initiatives aim at enabling government agencies to more efficiently work together and provide one-stop service to citizens and businesses. There are also e-government initiatives that focus on the internal efficiency and effectiveness of operations, resembling enterprise resource planning (ERP). Other e-government initiatives are intended to produce an overarching infrastructure to enable interoperability across different e-government practices, akin to the efforts of enterprise application integration practiced by businesses.

Over the past several decades, there has been a significant evolution of the adoption and use of information technology systems in the public sector in the United States and in Europe. In the United States, the main concern with IT systems revolved around the adoption and use of any type of information technology. Since the 1990s, the main theme has been the adoption and development of e-government services. In the 1990s, ideas began to emerge such as the "one stop shopping center" [Ho 2002]. This shift meant more than simply additional services and benefits to the outside world; it also meant important changes in the organizational structure of many governments. A 2002 study by Ho [2002] of the 55 largest U.S. cities found that the use of e-government drove several different shifts in management structure. In this study, e-government has been defined as the "production and delivery of government services through IT applications." Ho [2002, p. 440] states that, "future efforts to reinvent government through Internet usage needs to go beyond merely technological concerns in shaping information technology management." Thus, Ho concluded that the benefits of the information technology revolution were far from realized even among the largest U.S. cities.

Arguably, the adoption of IT systems and even e-government services is no longer a relevant question, except perhaps among small rural governments. Today, the relevant research question is the full integration and use of IT systems in government as opposed to the general adoption of IT systems. Until the early 2000s, comprehensive data about the status of state and local government information technology systems in the United States did not exist. The Government Performance Project (GPP) was designed to provide a comprehensive assessment of government operations in variety of arenas including IT. At the state level, the data provide evidence of both successful and failure in fully utilizing IT innovations. Similar to the states, there was strong evidence that cities had not integrated their IT planning with overall enterprise level strategic planning. In summary, while there has been significant adoption of information technology among state and local governments in the United States, there remain major gaps in the full integration and use of IT systems including knowledge management.

Today, these main concerns with IT systems have mutated into issues around the transformation of the multitude of data into information and knowledge management that will be beneficial to public sector organizations. At the end of the first decade of the 21st

century, knowledge management has become one of the key catchphrases in IT systems. Another important term is IT governance. An IT governance system gives the stakeholders of the organization's IT operations the opportunity to be involved in the technology decisions that impact them [Kavanaugh and Melbye 2009]. The objective of this type of governance is to ensure full alignment of IT systems across all departments within and across governments as well. Commentators have cautioned that IT governance does not substitute for other challenges facing IT systems in government such as poor funding, lack of training, and an inadequate vision for IT systems [Kavanuagh and Melbye 2009]. Knowledge management has been defined as the process of "a group of systems for capturing, storing and disseminating information" [Melbye 2008]. To date, knowledge management systems have a long way to go in state and local governments to become truly implemented and beneficial to users [Melbye 2008]. At present, IT systems are rarely a headline issue in U.S. policy debates at any level of government. They tend to be viewed as a backroom issues to support the critical service provides such as police officers, fire fighters, or other managers or street-level bureaucrats.

In Europe, the European Information Society project was set in motion in the early 1990s. It was a move by the European Union (EU) that was inspired by two factors. First, the U.S. National Information Infrastructure Initiative (NIII), introduced in the early 1990s, had a direct impact on many countries and international organizations; the EU was no exception. The guiding principles of the NIII provided a model for subsequent European initiatives expressed in such documents as the Bangemann Report [European Commission 1994] and e-Europe [European Commission 1994]. Another factor was the assumed potential of new information and communication technologies (ICTs). Advances in technology were expected to provide a key for economic growth and advantages in global competition. By 1993, the EU was ready to construct a new agenda and meet the challenge of the emerging information age.

The idea of a European Information Society was introduced in a meeting of the European Council in Copenhagen in the summer of 1993. By the end of that year the Commission published a white paper on future growth, competitiveness, and employment challenges [European Commission 1993]. This white paper emphasized the significance of the evolution toward the Information Society for the future of Europe. The basic idea was to start promoting a European-wide infrastructure to help revive economic growth and competitiveness and to create new markets and jobs. As a result, the Information Society became an officially recognized element of the overall strategy and a vision for the future of the EU. Indeed, the Information Society became the very core of the strategic goal and development policy of the Union and has remained ever since. European Information Society policy was stimulated by increased global competition. In this respect, the situation intensified during the 1990s. By the end of the decade, the Commission launched a new initiative entitled *eEurope: An Information Society for All*, which echoes the endeavour to modernize the European economy as expressed in the Bangemann Report. The *eEurope* initiative focuses on 10 priority actions covering such areas as cheaper Internet access, e-commerce, electronic services (especially schools and health care), intelligent transportation, and government online [European Commission 1999]. In early 2000, the European Council set its long-term strategic goals in two important summits. The EU's strategic goal for the new decade was "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion." Promoting Information Society development is clearly in the core of these policy lines.

In 2000, the European Commission launched the *eEurope initiative* with the aim of accelerating Europe's transition towards a knowledge based economy and to realize the potential benefits of

higher growth, more jobs, and better access for all citizens to the new services of the information age [European Commission 2000]. The first phase of the initiative was the *eEurope 2002 Action Plan*, which focused on exploiting the advantages offered by the internet and therefore on increasing connectivity. The idea was to close the internet gap between Europe and North America, as only about 22% of European households had Internet access compared to the United States, where about half of the nation's households were online in 2000. In 2002, the European Council launched a second phase, the *eEurope 2005 Action Plan*, which focused on exploiting broadband technologies to deliver online services in both the public and private sector.

The second phase was followed by the *i2010 Initiative*, the policy framework for the information society and media that promotes the positive contribution that ICT can make to the economy, society, and personal quality of life. Given the importance of ICT for today's economy, i2010 is a key element of the *Lisbon Strategy* for growth and employment. Thanks to the Lisbon Strategy, the Member States' commitment to continue improving public services offered to citizens and businesses through the use of ICT (in particular, reducing the administrative burden and consequently the administrative costs and thereby allowing citizens and businesses to interact efficiently and effectively with public administrations; ensuring inclusive e-government services; re-engaging citizens in political processes; and increasing transparency).

The i2010 strategy has three aims. The first purpose of the *i2010 Initiative* is to create a single, European information space, which promotes an open and competitive internal market for information society. Action in this area combines regulatory and other instruments at the Commission's disposal to create a market-oriented regulatory framework for the digital economy. The *i2010 Initiative* identifies convergence as a main factor for change for the ICT sector and the society at large. The second aim is to strengthen investment and innovation in ICT research. This priority focuses on the EU's research and development instruments and sets priorities for cooperation with the private sector to promote innovation and technological leadership. The third purpose is to support inclusion, better public services, and quality of life through the use of ICT, promoting a European Information Society for all citizens. Actions implemented under this priority aim to ensure that the benefits of the information society can be enjoyed by everyone. Areas of e-inclusion policy are aging e-accessibility, broadband gap (digital divide), inclusive e-government, digital literacy, and culture. The Member States have committed to specific targets in those areas in the Riga Ministerial Declaration [2006]. Other aims are to encourage provision of better public services (e-government, e-health) and to harness the potential of ICT to improve people's quality of life through flagship initiatives in the areas of intelligent transport, preservation of cultural heritage, aging, and sustainable growth.

In the European Union's internal market, people are able to move freely and, consequently, they have to be able to deal with public services outside their home country more and more. If e-government services are to provide significant added value to citizens and business, then it is crucial that different government bodies, both within a country and in different EU Member States, are able to share information easily and co-operate in serving citizens.

28.2.2 Strategies and Actors in Europe: The Italian and United Kingdom Experiences

At present, the EU's main policy strategies in the e-government field are explained in the *e-government Action Plan*. It was designed to help governments meet demands concerning the services they provide to citizens and businesses. Today, governments face major challenges, such as aging, climate change, and terrorism. Citizens are demanding better services, better security,

and better democracy, while businesses demand less bureaucracy and more efficiency. Moreover, as the European Union continues to enlarge and embrace greater diversity, new needs and demands are arising such as for seamless public services across borders, essential to increase citizens' opportunities for mobility and for business in Europe.

The *e-government Action Plan* focuses efforts on five priorities:

- Inclusive E-Government—Governments at national, regional, and local levels, together with their agencies and other intermediaries (NGOs, civil societies, volunteer associations, and the third sector in general), which deliver public services, are increasingly integrating ICTs into their processes, both behind the scenes and in their interfaces with the public. While e-government services should reduce the complexity of citizens' and businesses' dealings with government and its intermediaries, there is a danger that people without easy access to ICTs could find it even harder to deal with government.
- Efficiency and Effectiveness—E-government significantly contributes to high user satisfaction, transparency, and accountability; a lighter administrative burden; and efficiency gains. Improving efficiency and effectiveness in any kind of activity requires knowledge of the current situation and specific targets for improvement, often set by comparison with counterparts seen to be "doing better" in a particular area.

  In e-government, the EU is taking a leading role in developing measurement techniques and benchmarks against which organizations can judge their performances. In this way, governments and public authorities can better improve their use of e-government tools, and deliver real improvements to citizens and businesses through them. The EU fosters the deployment of efficient and effective e-government services with a two-pronged strategy. It promotes co-operation and exchange of best practice and technical standards through the benchmarking and impact assessment of services. It also supports several pilot projects that will demonstrate the improvements e-government brings to public services in real-life situations.
- High-Impact Key Services for Citizens and Businesses—The Action Plan aims to make high-impact services for citizens and businesses more widely available, such as electronic procurement services for businesses, services for mobile citizens, or social security services (e.g., pension records and electronic benefit applications). E-government will be critical to enable service providers to take advantage of market opportunities outside their home country.
- Key Enablers—The plan also seeks to put in place key enablers that provide the foundation for e-government systems to work together, and to build the connections between ICT systems in different public organizations and countries. Interoperable systems, electronic identity management, document authentication, and archiving technologies are all critical for public services to co-operate and share data. Open Source Software (OSS) can provide a cost-effective method to support such interoperability and co-operation.
- E-Participation—In order to reinforce governance in Europe, the Action Plan will help to strengthen citizen participation and democratic decision-making (e-participation) by using new technologies to develop interfaces between democratic institutions, public bodies and citizens, in particular through new forms of social organization such as online voting, consultation, and polling.

Each country adapts the European strategies to its particular context. To understand the correlation between e-government strategies, type of accountability, and level of performance, we now consider the case of two countries, a medium/normal country (such as Italy) and a leader country (the United Kingdom).

The past Italian e-government strategies have operated the national translation of the e-government objectives initially defined at European level. The Italian e-government action plan (2000–2002) laid down the strategy for the development and spread of ICTs within the Italian Public Administration. The *first implementation phase* of the plan was marked by a strong collaboration between central and territorial administrations. This collaboration resulted in the co-funding of 134 projects proposed by regions and local authorities and aimed at making online public services available to both citizens and businesses and implementing infrastructure services. The *second implementation phase* of the plan provided for the strengthening and the territorial extension of the projects launched during the first phase. A major step was reached with the publication of a strategic document agreed by the central state, the regions and municipalities, and entitled *E-government for an efficient federalism: a shared vision, a cooperative implementation* in April 2003. This document laid the foundations for the development of a consistent and sustainable e-government development in an Italian Public Administration heading toward a federal system. Since December 2001, annual guidelines have been issued, stating the e-government priorities for the coming year. The 2006 *Guidelines for the digitisation of Public Administration*, issued in November 2005, set the criteria and actions that every public administration shall implement in order to concretely achieve the principles enshrined in the *E-government Code* that entered into force on January 1, 2006. The Code is aimed at providing a clear legal framework for the development of e-government and for the emergence of an efficient and user-friendly public administration. Establishing a number of rules, obligations, recommendations and targets to promote the use of ICT in the public sector, it is intended to contribute to removing obstacles to further e-government development.

The current Italian e-government strategy is embodied in the document *Towards the National e-government System: Strategic Lines* that represent the third phase of the Italian e-government policies. The previous strategies left broad discretion to territorial public authorities as regards information systems, infrastructure investments, and innovation. The 2007 strategy focuses more on the sharing of common and consistent objectives between all types of administrations ("cooperative governance"). The aim is to guarantee full administrative interoperability, pursuant to the principle according to which citizens should perceive the Public Administration as a single entity. The new strategy identifies two complementary fields of action: computerization of public services, with usercentricity as its key component; and modernization of the public administration's work organization and processes (back-office) by establishing brand new and re-engineered internal processes. The priority is to re-launch the administrative reform through a consistent multi-level strategy combining technological innovation, legislative levers, organizational and management changes, as well as the valorization of the human capital and the measurement and evaluation of results. It is worth noting that the new Italian e-government strategy closely follows the core concept of the Lisbon strategy.

The actual Italian e-government strategy identified seven strategic objectives:

- Improvements in the Efficiency of the Italian Public Administration—Innovation is a process that should integrate all available levers (legal framework, ICTs, processes reorganization, human capital) in a context of strong coordination between central and local administrations, with a view to speed up procedures and reduce costs. Moreover, the various e-government actions shall involve all relevant national and local institutions, with these working collaboratively and avoiding overlaps. To such end, respective competencies and activities should be identified so as to define a new governance structure for e-government processes. Improving the efficiency of the administration also requires the simplification of administrative processes in order to lighten the weight bearing upon citizens and business.

The implementation of the e-government code provisions is a priority. Activating these provisions first implies the drafting of technical rules, so as to facilitate the launch of high-impact projects relating to the computerization of the full documental flow management (including transmission and conservation of documents). To that end, projects implementing the digital signature, the certified electronic mail, and the electronic documents will be supported.

- Achieving Interoperability and Full Cooperation Among Administration—The simplification process requires a global revision of the administration's work processes. This is based on a cooperative model within which each internal service delivered by each sub-administration is clearly defined. At the same time, basic tools and infrastructures shall be consolidated: broadband, Public Connectivity and Cooperation System (SPS), applicative cooperation, management of the documental flow, authentication systems, e-signature, and e-archiving. Administrative databases shall be made available for reciprocal access among administrations. Furthermore, several important public registers shall be integrated for collaboration initiatives to be launched between local and central administrations.
- Improving the Efficiency and Transparency of Public Expenditure—The computerization of payments within the administration and to the attention of the administration shall be fully ensured in order to allow for the optimal monitoring of public expenditure. To such regard, integrated auditing systems shall be developed. Moreover, in order to increase the administration's transparency relating to the public purchase of goods and services, the use of e-procurement tools will be promoted.
- Building E-Citizenship by Promoting E-Democracy and Overcoming the Digital Divide—E-democracy is an important tool for increasing citizen's participation in public life by means of new methods. The first step to implement e-democracy is the overtaking of the digital divide and the promotion of e-inclusion, which are among the priority objectives of the Italian e-government policy. E-democracy projects co-funded by the Italian National Agency for Digital Administration (CNIPA) are currently under monitoring phase. Actions to counter the digital divide will also be oriented towards the achievement of a secure and modern national identification system network to allow citizens to access public e-services. In any case, new e-services need to be set up, and that will require user identification, the e-id as an identification tool in addition to the other admitted tools, the removal of technological and legal barriers to businesses and citizens' access to online payment services, and the accessibility of national portals and administrative Web sites.
- Adoption of a Systematic Quality and Efficiency Measurement Approaches—Each action of the public administration shall be measurable both in quality and in quantity. Three correlated levels of process will be monitored: the quality of public services as directly perceived by citizens and businesses (the so called "front-office"); the quality of the internal administrative processes aimed at supplying these services ("back-office"); the compliance of the supporting information systems that enable processes and services with the e-government strategic objectives. Furthermore, a knowledge and innovation network composed of researchers and scientists will be created with the aim to develop innovating administrative processes and to take part in pilot projects.
- Creation of a Competitive Environment for Businesses and ICT Industry—The administration shall become an "intelligent customer" by supporting innovative projects that promote open standards and specifications, but also interoperable, inclusive, and transparent solutions complying with privacy rules and products that can be exported beyond Italian borders. To such end, the administration shall identify relevant lead markets. An Open Source

development policy must be adopted and initiatives relating to collaborative management and development at central, regional, and local levels must be strongly supported.

- Play a More Active Part in the European Administrative Innovation Process—This implies taking a greater part in the exchange of experience and good practice at the European and international levels. At the same time, Italy will implement the Lisbon strategy for growth and jobs through several measures based on 4 priority objectives: to modernize the public administration, with particular focus on services to citizens and businesses; to implement high impact and innovative projects in areas such as e-recognition, info-mobility, education, health and tourism; to support technological innovation, with specific focus on Small and Medium Enterprises (SMEs); and to reduce the digital divide.

Italian actors involved in the IT and e-government issues are the Minister for Public Administration, the Committee of Ministers for the Information Society, the Standing Committee on Technological Innovation, the Regional Competence Centers, and the local authorities (Municipalities). The Minister for Public Administration and Innovation is tasked, among others, with the definition of the Italian e-government strategy. The Committee of Ministers for the Information Society is charged with devising and/or endorsing the strategic action lines pertaining to Information Society in Italy. This Committee involves several senior ministers, and it is chaired by the Minister for Public Administration and Innovation.

The e-government Code established the Standing Committee on Technological Innovation, with the function of advising the Prime Minister or the Minister responsible for the development and implementation of technological innovation in State administrations. Besides the common policies agreed at national level with the central government ministries and with the other regional governments, each Italian regional government has adopted over the past years a regional information society strategy, almost always comprising as well a territorial action plan for e-government. (This was also formally requested in order to participate in the first phase of the Italian local and regional e-government program.) The regional and local authorities are responsible for the implementation of regional and local e-government projects falling within their respective areas of competence. The Regional Competence Centers is a support network of expertise providing local public sector bodies in their areas with technical assistance, information and training activities. They support regional and local governments in their efforts to implement e-government, upgrade their IT systems and reorganize both their back-office processes and their service delivery channels. The 21 Centers are currently operational, with a total of about 200 staff nationwide.

The United Kingdom's e-government strategy is set in the document *Transformational Government - Enabled by Technology* published in 2005. The Prime Minister commissioned this strategy to seize the opportunity provided by technology to transform the business of government. Technology has a major part to play in the solutions to each of three major challenges that globalization is setting modern governments—economic productivity, social justice, and public service reform. The document presents a strategic view which shall enable the United Kingdom to use technology decisively and effectively across government to meet its national objectives. The United Kingdom's strategy focuses upon the core themes that each public sector organization needs to develop into actions for its area of responsibility, and on the supporting actions to be taken across government as a whole. The strategy has been initially complemented by the *Transformational Government Implementation Plan*, published on March 29, 2006. For each of the work streams identified in the strategy, this implementation plan focused on the priority tasks.

The vision of the *Transformational Government—Enabled by Technology* is to better use technology to deliver public services and policy outcomes that have an impact on citizens' daily lives

through greater choice and personalization, delivering better public services, such as health, education, and pensions; benefiting communities by reducing burdens on front-line staff and giving them the tools to help break cycles of crime and deprivation; and improving the economy through better regulation and leaner government. However, the vision is not just about transforming government through technology; it is also about making government transformational through the use of technology—creating and retaining the capacity and capability to innovate and use technology effectively as technology itself develops. This is the only way in which public services can keep up with a continually changing, globalized society.

Consequently, the 4 key points to realize are the following. *Services need to be designed around citizens and businesses* to ensure effectiveness of delivery to the customer, to achieve policy goals, and to release savings by reducing duplication and streamlining processes (customer satisfaction, though important, is not the only goal). The key actions required are (1) to increase understanding of customer needs and behaviors; (2) to define customer groups and appoint directors to lead the overall development of services to those groups; and (3) to develop modern channels and manage the migration to them. A new *shared services approach* is needed to release efficiencies across the system and support delivery more focused on customer needs. Shared services provide public service organizations with the opportunity to reduce waste and inefficiency by re-using assets and sharing investments with others. Particular attention should be paid to the following areas: customer service centers; human resources, finance, and other corporate services; common infrastructure; data sharing; information management; information assurance; identity management; technology standards; and architecture. Government's ambition for technology enabled change is challenging but achievable provided it is accompanied by *a step-change in the professionalism* with which it is delivered. This requires: coherent, joined-up leadership and governance; portfolio management of the technology programs; development of IT professionalism and skills; strengthening of the controls and support to ensure reliable project delivery; improvements in supplier management; and a systematic focus on innovation. *Coherent, joined-up leadership and governance* across government are essential to ensure the vision and programs set out in this strategy are achieved and that the opportunities for technology to enable change continue to be identified, communicated, managed, and delivered effectively. Complex reform requires consistent pressure to be applied across the whole system for a number of years. Leadership needs to be provided at several levels—by Ministers and Councillors; by Heads of Department and equivalents; by business leaders across the public sector; by CIOs; and by industry leaders—and aligned with the wider governance of the public services. An open and transparent approach to plans and performance is essential.

Between 2007 and 2011, the priority for technology investment and business change must be transforming delivery into public services centered around citizens and businesses and transforming support into a shared services framework. During this period it will also be important to realize the financial and service benefits of current and planned investments. The goal should be to have made the key changes, to have embedded the new cultures, and to have made the process irreversible, by 2011.

The United Kingdom main actors are the Cabinet Office, the Transformational Government Group, the Chief Information Officer (CIO), the Central government departments, the Department for Communities and Local Government (DCLG), Local Councils, and the Audit Commission. The Cabinet Office holds political responsibility for government reform and modernization and for the United Kingdom's e-government policy. The Cabinet Office is a government department whose role is to support the Government's delivery and reform program. It sits at the heart of Government, alongside the Prime Minister's Office and the Treasury, and aims to ensure that the Government delivers its priorities. To this end, the Cabinet Office works with Departments and others to secure

excellence in policy-making and responsive, high quality public services. Within the Cabinet Office, the Transformational Government Group is in charge of driving the e-government agenda forward and of formulating IT strategy and policy. The Chief Information Officer (CIO) Council brings together CIOs from across all parts of the public sector to address common issues, and it is in charge of working with the Transformational Government Group to produce a new IT strategy for Government for the period beyond 2005. It is also aimed at promoting the role of CIOs in the public sector and at increasing the success rate of Government IT projects. The Transformational Government Board is in charge of coordinating transformational government developments in government departments; of promoting best practice across government; and developing, implementing, and operating the main components of the national e-government infrastructure. The Transformational Government Group provides support and guidance to Government departments and agencies for the implementation of their business transformation strategies. Central government departments and agencies are in charge of implementing departmental or sector specific information systems and e-government projects. The Department for Communities and Local Government (DCLG) has a powerful remit to promote community cohesion and equality, as well as responsibility for housing, urban regeneration, planning and local government. These functions were previously split between several government departments. The DCLG is tasked with coordinating local e-government efforts, while Local councils are responsible for the implementation of e-government projects, within the frame of their competences. The Audit Commission—an independent, non-departmental public body sponsored by the Office of the Deputy Prime Minister with the Department of Health and the National Assembly for Wales responsible for ensuring that public money is used economically, efficiently, and effectively by local authorities and for other public services delivered locally—is running a project to audit local authorities' e-government efforts.

28.2.3 E-Government in Europe: The Italian and United Kingdom Outputs

To ensure the success of e-government, new technologies must be used effectively. The provision of high quality public services is one of the keystones of the *i2010* program, and public services are playing an important role in the route to an inclusive European society. They also play an important role in the success of the European economy. The report, *User Challenge Benchmarking the Supply of Online Public Services* [European Commission 2008], is the European Commission's benchmark study on electronic public services in Europe. With it the European Commission has measured the progress of the online public service delivery in Europe to monitor the availability of public services online and the number of public services fully available online. To get a better view on the evolution of services, the EU has combined different services into clusters. Such services are now a recognized and integral means to deliver the *i2010 eGovernment Action Plan*, across all the five priorities described above. The complete list of the 20 public services is displayed in Table 28.1.

The benchmark is based, in the first place, on the "Web-based" assessment of more than 5,000 public agencies and 14,000 Web pages providing the 20 public services in the 31 participating countries. The participating countries are the 27 Member States, plus Iceland, Norway, Switzerland, and Turkey (noted as EU27+). In this 2007 benchmark, the following indicators have been measured: an online sophistication indicator for the extent to which the online provision of the 20 common services is based on new models of front and back-offices integration; the reuse of available data and degree to which the idea of pro-active service delivery is embedded; and

Table 28.1 Electronic Public Services for Citizens and Businesses in Europe

Citizens	*Businesses*
1. Income Taxes	13. Social Contribution for Employees
2. Job Search	14. Corporate Tax
3. Social Security Benefits	15. VAT
4. Personal Documents	16. Registration of a New Company
5. Car Registration	17. Submission of Data to the Statistical Office
6. Application for Building Permission	18. Custom Declaration
7. Declaration to the Police	19. Environment-Related Permits
8. Public Libraries	20. Public Procurement
9. Birth and Marriage Certificates	
10. Enrolment in Higher Education	
11. Announcement of Moving	
12. Health-Related Services	

Source: European Commission, *The User Challenge Benchmarking The Supply Of Online Public Services,* 7th Measurement, Directorate General for Information Society and Media, http://ec.europa.eu (section information society), 2008; pp. 12–13.

the number of public services fully available online (Figure 28.2). Sophistication and fully online availability have a high correlation, as illustrated in the graph below. The scores on sophistication are therefore on average higher than the fully-availability online where a service will only be considered online.

A comparison between the sophistication and full online availability of online services in Italy and the United Kingdom is presented in Figure 28.3.

Italy has made sound progress from 2001 to 2007. Italy scores a high *overall sophistication* of 79% and a progression in *fully-online availability* of 70%, coming from 58%, a substantial move to 11th position. The Italian National Portal offers access to all of the 20 basic public services. The navigation possibilities could still be improved; however, all information to find one's way is present. The scoring in this survey for the National Portal is at 82% against an average for the EU27+ of 75%. The National Portal provides a comprehensive starting point for searches related to the citizen's services, with different search modes such as life events and themes, with a shortcut to the online services. E-Government supply in Italy for enterprises is well above EU average. Use among enterprises is also good for basic services and above average for more advanced types of interactions. When it comes to citizen use, other countries have shown stronger growth leaving Italian citizen use well below average. In 2008, the *Italian National Reform Programme* has been revised according to the new objectives of e-government. One hundred and thirty-four regional and local projects have been co-financed to improve levels and quality of e-government services.

In the United Kingdom, 89% of the basic public services are *fully available online*. This shows a marked improvement compared with 2006. *Online sophistication* of public services

	Online sophistication	Full availability
Austria	0.98	1
Slovenia	0.95	0.94
Malta	0.95	0.9
Portugal	0.9	0.9
United Kingdom	0.895	0.89
France	0.88	0.79
Sweden	0.875	0.76
Estonia	0.87	0.745
Norway	0.865	0.7
Germany	0.85	0.7
Spain	0.84	0.7
Netherlands	0.83	0.7
Finland	0.815	0.675
Belgium	0.8	0.64
Denmark	0.8	0.64
Italy	0.79	0.6
Ireland	0.785	0.55
Czech Republic	0.71	0.55
Hungary	0.71	0.5
Turkey	0.68	0.5
Greece	0.68	0.5
Iceland	0.68	0.45
Luxembourg	0.665	0.45
Cyprus	0.665	0.4
Lithuania	0.64	0.35
Swizerland	0.6	0.35
Romania	0.585	0.35
Slovakia	0.58	0.3
Latvia	0.55	0.25
Poland	0.535	0.205
Bulgaria	0.51	0.15

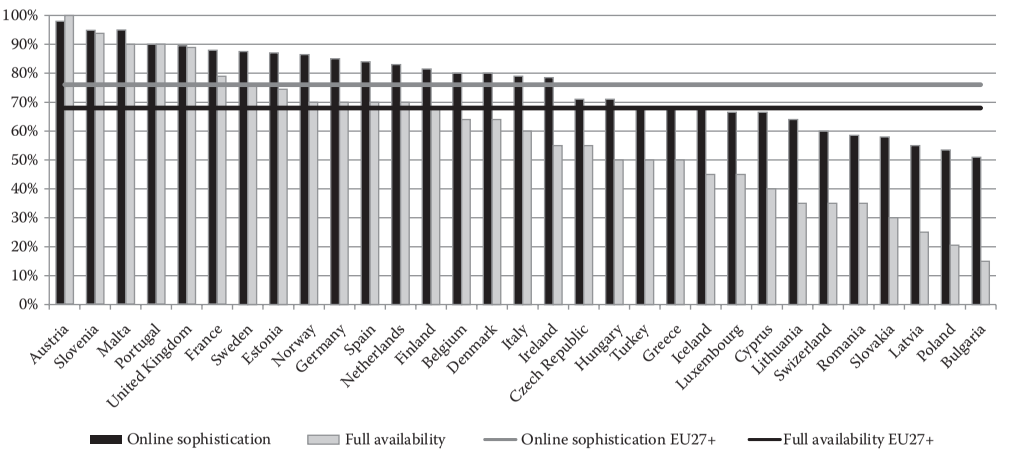
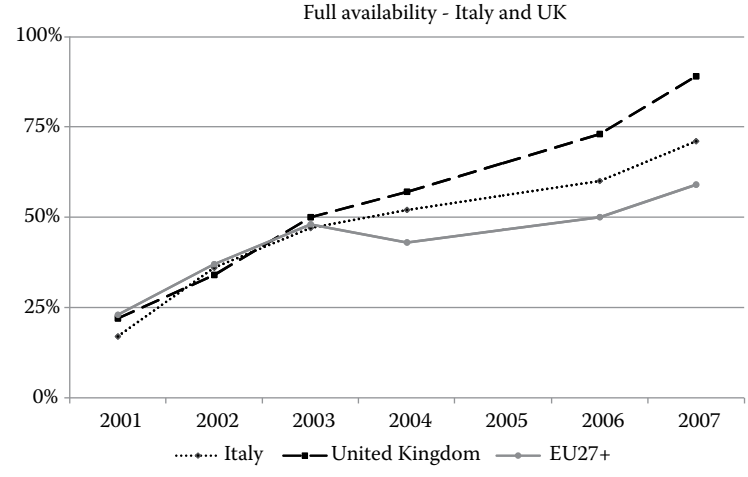


Figure 28.2 Online availability and full sophistication in Europe. (From European Commission, *The User Challenge Benchmarking The Supply Of Online Public Services*, 7th Measurement, Directorate General for Information Society and Media, http://ec.europa.eu [section information society], 2008, p. 17.)

(a) Full availability

	Italy	UK	EU27+
2001	0.17	0.22	0.23
2002	0.36	0.34	0.37
2003	0.47	0.5	0.48
2004	0.52	0.57	0.43
2005	0.56	0.65	0.465
2006	0.6	0.73	0.5
2007	0.71	0.89	0.59



(b) Online sophistication

	Overall	Citizens	Businesses
EU27+	0.75	0.74	0.86
Italy	0.79	0.75	0.85
UK	0.9	0.89	0.9

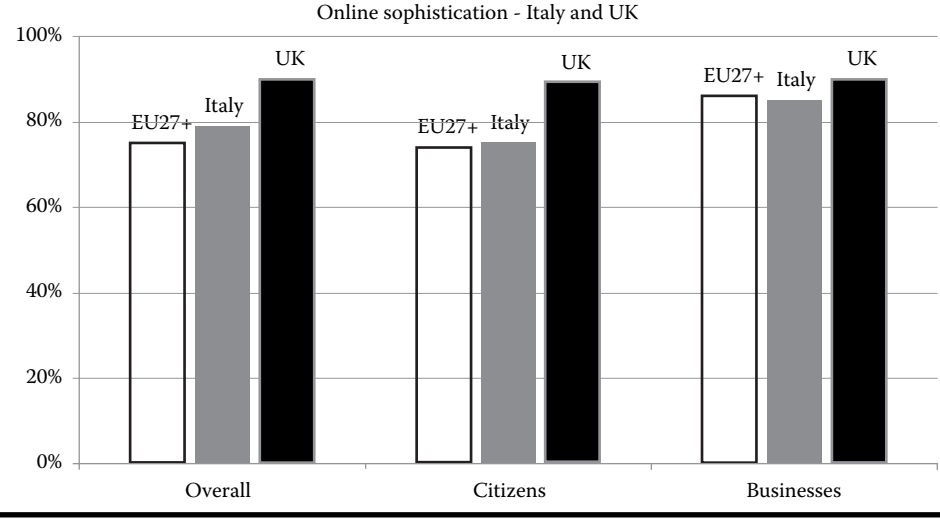


Figure 28.3 On line availability and full sophistication in Italy and UK. (From European Commission, The *User Challenge Benchmarking The Supply Of Online Public Services,* 7th Measurement, Directorate General for Information Society and Media, http://ec.europa.eu [section information society], 2008, pp. 57–58 , 89–90.)

scores 90%, in the range above transactional toward pro-active targeting. The level of sophistication of services for citizens is almost as equally developed as those for business. The United Kingdom now ranks 5th of the EU27+ countries on both indices. The majority of the public services for citizens are accessible through the *national portal*. The U.K. national portal achieved a 90% scoring against an average for the EU27+ of 75%. Table 28.2 summarizes how typical e-government develops and looks in the public administration in Italy and the United Kingdom in terms of strategies, actors, and outputs.

28.3 The Influence of Information Systems on Accountability and Performance in Italy and United Kingdom

Now we return to the question that opened this chapter: To what extent do IT systems influence accountability and performance in the public sector? With the aim of addressing this question, it is helpful to categorize the strategies adopted in the two cases analyzed here using the three dimensions described in Section 28.1.3, namely, the nature of the accountability relationship, the level of government and types of external stakeholders involved, and the type of performance. A summary is presented in Table 28.3.

At a glance, two main differences are noticeable. First, the two countries seem to be focused on distinct aspects of performance: Italy is concerned about efficiency, while the United Kingdom is more oriented to effectiveness. This can be explained by previous studies that have demonstrated the existence of general trends in e-government where in each stage there is an emphasis on specific aspects of performance [Heeks 2006]. Data shows that in terms of e-government, the United Kingdom performs differently from Italy and this may indicate that the two countries are living in different stages of introduction, which suggests the need to bring more attention on effectiveness for United Kingdom and on efficiency for Italy.

Second, Italy seems to have a higher degree of agency control in terms of accountability mechanisms—several strategies fall into the legal or bureaucratic categories, compared to United Kingdom, where IT strategies are classified as more political-like. The rationale for this evidence might be twofold. From one side, it can be argued that this difference depend on the diverse administrative systems of the two countries or, under a wider and more comprehensive perspective, on the context difference made not only by the administrative systems, but also by socio-economic forces, political systems, and elite decision making [Pollitt and Bouckaert 2004]. Thus, for Italy it is felt that strategies for implementation of new information systems must be coupled with tight accountability mechanisms, while in the United Kingdom a lesser degree of agency control would better fit to its specific context. From the other side, it can be argued that different accountability mechanisms are used for different goals. For example, our analysis suggests that the United Kingdom is at the foremost level of implementation of IT and for this reason it may have been less necessary to use severe accountability mechanism to implement strategies that present very challenging effectiveness goals. On the contrary, Italy has chosen to rely on accountability mechanisms with a high degree of control accountability mechanism designed to close the gap with the highest level of performance achieved by the leader countries.

Information systems in government need to be reexamined in light of the accountability and performance pressures in the modern administrative state. Like other parts of government administration, IT systems can be subject to a variety of performance definitions and accountability pressures which are defined by a variety of stakeholders. These pressures and definitions were examined in the context of the United Kingdom and Italy, which represents two contexts at

Table 28.2 Strategies, Actors, and Outputs in Italy and the United Kingdom

	EU	*Italy*	*UK*
Main policy strategies declared	1. Inclusive e-government 2. Efficiency and effectiveness 3. High-impact key services for citizens and business 4. Key enablers 5. E-participation	1. Efficiency of the Public Administration 2. Interoperability and full cooperation among administrations 3. Efficiency and transparency of public expenditure 4. E-citizenship by promoting e-democracy and overcoming the digital divide 5. Systematic quality and efficiency measurement approach to administrative process 6. Competitive environment for businesses and to boost the growth of the ICT industry 7. A more active parting the European administrative innovation process	1. Services around citizens and businesses to ensure effectiveness of delivery to the customer, and to achieve policy goals 2. Shared services to release efficiencies across the system 3. Professionalism in the delivery of technology 4. Coherent and joined-up leadership and governance across government
Actors		Strategic Actors: - Minister for Public Administration and Innovation - Committee of Ministers for the Information Society - Standing Committee for the Technological Innovation - Regional Competence Centres Operative Actors: - Municipalities Assessment Actors: *Not present*	Strategic Actors: - Cabinet Office - Transformational Government Board - Chief Information Office (CIO) - Central governments department and Agencies - Department for communities and local governments (DCLG) Operative Actors: - Local councils Assessment Actors: - Audit Commission
Outputs		Services: Fully on line availability: 70% Overall on line sophistication: 79%	Services: Fully on line availability: 89% Overall on line sophistication: 90%

Table 28.3 Information Systems, Accountability, and Performance in Italy and the United Kingdom

		Declared strategies for improvement of e-government			*Nature of the accountability relationship*	*Level of government and types of externals stakeholders involved*	*Type of performance*
	Current Outputs	***Core strategies***	***Supportive/ ancillary strategies***				
Italy	Full on line availability: 70% Overall on line sophistication: 79%	1. Efficiency of the Public Administration	5. Systematic quality and efficiency measurement approach to administrative process	7. A more active part in the European administrative innovation process	Bureaucratic	All levels of government	Efficiency
		2. Interoperability and full cooperation among administrations			Legal	All levels of government together	Efficiency, Effectiveness
		3. Efficiency and transparency of public expenditure			Legal	All levels of government Auditors	Efficiency
		4. E-citizenship by promoting e-democracy and overcoming the digital divide			Legal (Local Governments)/ Bureaucratic (State/Regions)	All levels of government	Effectiveness
		6. Competitive environment for businesses and to boost the growth of the ICT industry			Professional	All levels of government together IT Professional Groups	Efficiency, Effectiveness

United Kingdom	Full on line availability: 89% Overall on line sophistication: 90%	1. Services around citizens and businesses to ensure effectiveness of delivery to the customer, and to achieve policy goals		Political	All levels of government Customers/ Citizens	Effectiveness
		2. Shared services to release efficiencies across the system		Political	All levels of government	Efficiency
		3. Professionalism in the delivery of technology		Professional	All levels of government, IT Professional Groups	Effectiveness
		4. Coherent and joined- up leadership and governance across government		Political	All levels of government, Ministries and Councillors Heads of Department, Business leaders, CIOs, Industry leaders	Effectiveness

different stages of IT introduction. Unlike some other systems, there is a reciprocal nature to IT systems with regards to accountability and performance. Information technology systems, and the type of data they collect and distribute, contribute to the nature of performance regime debate and the type of accountability relationships that are constructed over time. This new view of information systems technology should bring policy makers to a more careful consideration of performance and accountability pressures that different IT strategy options inevitably bring with them.

References

Achterkamp, M. C. and J. F. J. Vos. 2007. Critically identifying stakeholders. *Systems Research and Behavioral Science* 24(1):3.

Anthony, R. N. and D. W. Young. 2003. *Management Control in Nonprofit Organizations,* 7th ed. McGraw-Hill/Irwin: Burr Ridge, IL.

Battini, F. 2007. I controlli sulle autonomie nel nuovo quadro istituzionale [Auditing in local governments within the new institutional frame]. *Azienditalia*, 1/2007:11–18.

Bovaird, T. 1996. The political economy of performance measurement. In *Organizational Performance and Measurement in the Public Sector: Toward Service, Efforts and Accomplishment Reporting*, eds. A. Halachmi and G. Bouckaert, 145–165. Quorum Books: Westport, Connecticut.

Bovaird, T. and A. Halachmi. 2001. Performance measurement and best value: An international perspective. *International Journal of Business Performance Management* 3(2–4):119–34.

Chen, Y. and J. Gant. 2001. Transforming local e-government services: The use of application service providers. *Government Information Quarterly* 18(4):343–55.

De Bruijn, H. 2002. *Managing Performance in the Public Sector*. Routledge: London.

Dubnick, M. J. and B. S. Romzek. 1991. *American Public Administration: Politics and the Management of Expectations*. Macmillan: New York.

European Commission. 1993. *Growth, Competitiveness and Employment: The Challenges and Courses for Entering into the XXIst Century*. White Paper: COM.

European Commission. 1994. *Europe and the Global Information Society: Recommendations to the European Council* (also known as the Bangemann Report). ISPO. Brussels, Belgium.

European Commission. 1999. eEurope: An information society for us all. europa.eu.int/comm/information_society/eeurope/index_en.htm.

European Commission. 2000. eEurope action plan. europa.eu.int/comm/information_society/eeurope/actionplan/index_en.htm.

European Commission. 2007. *i2010 - Annual Information Society Report 2007.* vol. 3.

European Commission. 2007. *The User Challenge Benchmarking the Supply of Online Public Services*, 7th Measurement. September. Capgemini: Belgium.

Farneti, G., L. Mazzara, and G. Savioli. 1996. *Il Sistema Degli Indicatori Negli enti Locali [Performance Measurement Indicators in Local Governments].* Giappichelli: Torino.

Guthrie, J., C. Humphrey, L. R. Jones, and O. Olson (eds.). 2005. *International Public Financial Management Reform. Progress, Contradictions, and Challenges*. Information Age Publishing: Greenwich, CT.

Hacking, I. 1983. *Representing and Intervening*. Cambridge: Cambridge University Press.

Hammers Specht, P. 2000. The impact of IT on organization performance in the public sector. In *Handbook of Public Information Systems*, ed. G.D Garson, 141–151. Marcel Dekker: New York.

Hammers Specht, P. and G. Hoff. 2005. Information technology investment and organizational performance in the public sector. In *Handbook of Public Information Systems*, ed. G.D. Garson, 127–142. CRC Press: New York.

Hatry, P. H. 1999. *Performance Measurement. Getting Results*. The Urban Institute Press: Washington, DC.

Heeks, R. 2001. Understanding e-governance for development. IDPM i-Government Working Paper 11.

Heeks, R. 2006. Benchmarking egovernment: Improving the national and international measurement, evaluation and comparison of egovernment, IDPM i-Government Working Paper 18.

Hoek, F., C. van Montfort, and C. Vermeer. 2005. Enhancing public accountability in the Netherlands. *OECD Journal on Budgeting* 5(2):69.

Ho, A. 2002. Reinventing local government and the e-government initiative. *Public Administration Review* 62(4):434–444.

Hood, C. 1991. A public management for all seasons? *Public Administration* 69(1):3–19.

Hood, C. and H. Margetts. 2007. *The Tools of Government in the Digital Age.* Palgrave Macmillan: New York.

Kavanagh, S. and D. Melbye. 2009. Picking winners: Shrewd investing in IT assets through IT governance. *Government Finance Review* February 25(1):8–14.

Melbye, D. 2008. *Public-Sector Knowledge Management: Putting the Pieces Together*. *Government Finance Review* April 24(2).

Miller, P. and N. Rose. 1990. Governing economic life. *Economy and Society* 19(1):1–31.

Osborne, D. and T. Gaebler. 1992. *Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector*. Addison Wesley: Reading, MA.

Padovani, E. and E. Scorsone. 2009. Comparing local governments' performance internationally: A mission impossible? *International Review of Administrative Sciences* 75(2).

Pallott, J. 1992. Elements of a theoretical framework for public sector accounting. *Accounting Auditing and Accountability Journal* 5(1):38–59.

Patton, J. 1992. Accountability and governmental financial reporting. *Financial Accountability and Management* 8(3):165–180.

Poister, T. H. 2003. *Measuring Performance in Public and Nonprofit Organizations*. Jossey-Bass: San Francisco, CA.

Pollitt, C. 2003. *The Essential Public Manager*. Open University Press: Berkshire, United Kingdom.

Pollitt, C. 2008. *Time, Policy, Management. Governing with the Past*. Oxford University Press: New York.

Roberts, J. and R. Scapens. 1985. Accounting systems and system of accountability-understanding accounting practices in their organizational contexts. *Accounting Organizations and Society* 10(4):219–237.

Romzek, B. S. and M. J. Dubnick. 1987. Accountability in the public sector: Lessons from the Challenger tragedy. *Public Administration Review* 47(3):227–238.

Talbot, C. 2006. Performance regimes and institutional context: Comparing Japan, UK and USA. International Symposium on Policy Evaluation, Tokyo.

Talbot, C., J. Wiggan, and C. Johnson. 2005. Exploring performance regimes: A new approach to understanding public sector performance [A report for the National Audit Office]. Nottingham Policy Papers no.4.

Willmott, H. 1996. Thinking accountability: accounting for the disciplined production of self. In *Accountability: Power, Ethos and the Technologies of Managing*, eds. R. Munro and J. Mouritsen. International Thomas Business Press: London.

Worral L., D. Remenyi, and A. Money. 2000. A methodology for evaluating the effectiveness of delivery of IT services: A comparative study of six british local authorities. In *Handbook of Public Information Systems*, D. Garson ed., 501–520. Marcel Dekker: New York.

CONCLUSION VII

Chapter 29

Advancing Public Information Systems Research: Clarifying Concepts and Testing Models

Christopher M. Shea

CONTENTS

29.1 Introduction

The scope of topics related to information systems in the public sector is broad and likely will continue to widen as relationships between the technologies, stakeholders, and the policy environment continue to evolve. In addition, the field of public information systems research, particularly e-government, is relatively young, as the first empirical articles focusing on e-government were published in 1999 [Norris & Lloyd 2006]. Therefore, and perhaps not unexpectedly, the body of empirical literature is rather small and the need for additional research remains.

Several book chapters [e.g., Garson 2003] and journal articles [e.g., Dawes 2008] have identified e-government and e-governance topics in need of further research. The purpose of this concluding chapter is not to provide a thorough review of such topics. Instead, this chapter discusses two broad, but important, research methods issues important for advancing our understanding of public information systems: clarifying key concepts and developing and testing useful models. In doing so, the discussion draws substantially from Nolan's [1973] seminal work on

theory development for the management of computer resources in organizations, criticisms of that work, as well as examples presented in the works of other authors, some of whom are featured in this book. I hope that the examples provided in this chapter will spark discussion about additional concepts and models that should be considered.

29.2 Clarifying Concepts

Nearly 40 years ago, Nolan [1973] discussed the state of normative theory for managing computer resources in organizations, though not specific to public agencies. At the time, he warned that "even the terminology abounds with imprecision." The same might be said today about some key concepts specific to public information systems research.

Imprecision typically involves a lack of clarity about the characteristics of a given concept, which can result in the use of multiple terms for the same concept or the misapplication of terms for a given concept. For example, the concept of "performance" demonstrates the need for greater precision. In this book, Orelli and colleagues discuss the definition of performance in their chapter "Information Systems, Accountability, and Performance in the Public Sector: A Cross-Country Comparison" (Chapter 28). As they indicate, the concept of performance is frequently used in discussions of information systems and public agencies, yet there is not a consensus on what constitutes performance. One may question whether the concept is a measure of efficiency, effectiveness, or both. The lack of a universal definition amplifies the need for researchers to clearly explain their use of the concept and how it is operationalized. Not doing so results in a potential impediment to better understand the relationship between information systems and organizational performance, for example.

Imprecision of terminology also may involve a lack of depth in defining key concepts, that is, using a broadly defined concept to represent specific subcategories of the concept, instead of drilling down to define the subcategories individually. Of course, for some research purposes, the broadly defined concept may be suitable. However, for other purposes, such as those focusing on one or more of the subcategories, using the broadly defined concept may be misleading. Saebo et al. [2007] discuss an example of such imprecision. The authors present a work-in-progress for defining the entities of "government" and "citizen" with finer granularity, delineating between types of roles within each broad category of entity. The government roles are identified as "politician," "administrator," and "service provider," and the citizen roles as "consumer," "activist," and "direct decision maker" [Saebo et al. 2007].

The proposed framework illustrates how clarifying concepts can lead to advances in understanding the barriers and impacts of e-government initiatives. The finer granularity in these conceptualizations leads to questions about previously held understandings of stakeholder relationships in the context of e-government. For example, the government-to-citizen relationship instantly becomes more complex when considering the various roles citizens may hold and the fact that these roles may change depending on the issue at hand. Along these lines, relationships within, not just between, entities emerge as underexplored areas of research. Finally, our conceptualizations of other entities, such as "business," become candidates for further refinement in the context of e-government (Saebo et al. 2007).

This layered approach to defining the entities of government and citizen is a reminder that e-government research is still in the early stages. If we have not yet defined, with precision, who the stakeholders are for research purposes, it is difficult to advance theory with respect to relationships between stakeholders and the factors that influence these relationships. Furthermore, with a

revised definition of the stakeholders comes the potential need for refining the conceptualization of the influencing factors.

Referring back to Nolan's early work [1973], he called for a "formative period" of research on computer resources in which "the set of variables exerting major influence … is identified, the behavior and interrelationship of the variables is determined, and finally, the generality and the major determinants of the variables are assessed." One could argue that research in e-government and e-governance requires a similar approach. However, this does not necessarily require starting over from scratch. In fact, it has been noted that researchers to date, by and large, have assumed e-government to be a unique phenomenon, substantially different from innovation in other fields of research, and therefore have been attempting to "reinvent the wheel" [Coursey 2008]. Clearly, the identification and definition of key concepts and the testing of relationships between variables should be informed by past research, both from the field of public administration and other fields [Coursey 2008] to help ensure cumulative knowledge development [Saebo et al. 2007].

29.3 Testing Models

Phenomena are often conceptualized in stage models, particularly in the formative period of research [Nolan 1973], perhaps because such models assist with identifying relevant factors and reducing complexity in a way that aids understanding. A stage model typically posits that a given phenomenon can be explained as a linear process of completing discrete steps (i.e., stages). For example, a unit of analysis (e.g., person, organization, etc.) might begin at stage 0, with respect to the given phenomenon. Once the unit evolves and achieves pre-specified criteria belonging in stage 1, it is said to have completed stage 1. Furthermore, the model assumes that the unit cannot complete stage 2 prior to completing stage 1. One of the most cited examples of such a model is Jean Piaget's "Theory of Cognitive Development," which proposes that children pass through 4 stages prior to reaching adult-level intelligence [Lourenco & Machado 1996; Child Development Institute n.d.]. A few stage models also were presented throughout this volume, for example, Holden (Chapter 14) on the evolution of IT management literature and Schatteman (Chapter 26) on e-reporting.

While stage models can be helpful during the formative period of research, they may have limitations. For example, Nolan's [1973] stage model of managing computer resources, while clearly influential, also has been criticized for many of its assumptions. As an "evolutionist" model, it presumes a successive pattern of stage completion; that is, each stage is achieved in a sequence that typically resembles a "life cycle" of birth, growth, and maturation [King 1984]. While consistent with a familiar logic model, such a pattern may prove to be more useful as a normative model than as a descriptive model. This occurrence is at the heart of critical observations of Nolan's model [King 1984] and of stage models of e-government [Coursey 2008].

Coursey [2008] empirically tests the validity of the claims of five prominent stage models of e-government that share common characteristics. He finds that while there is evidence supporting the earliest stages of the models, there is conflicting evidence at best that the hypothesized progression (or evolution) through the middle and later stages is occurring. Like most research endeavors, the data and methods used for the empirical testing could be challenged. However, the key points, at least for this discussion, are that (1) conceptual models must be tested in order to be moved beyond supposition to actionable guidance; and (2) given the lack of evidence that the stage models are accurate descriptors of e-government development, alternative models should be explored.

Why are reliable conceptual models important to have? In short, models guide our thinking about how the world works, whether overtly (e.g., in research studies) or implicitly (e.g., in daily decision-making situations). They can be useful for reducing complexity and influential in guiding and/or reinforcing beliefs about a phenomenon at hand. However, if a model is not an accurate characterization of the phenomenon, then it not only has limited predictive value but it also is potentially misleading [Brown 2007].

Underlying the development of any model are assumptions about the importance of the phemonenon and the relationships between key factors influencing the phenomenon. For example, as Coursey [2008] observes, the five e-government models he tests demonstrate a "more-is-better" perspective with respect to e-government services. He also points out that such a bias is consistent with findings indicating that the demand for e-services is not necessarily being driven by citizens but instead by governments and IT professionals [Coursey 2008]. When this bias is held by decision-makers but not supported by citizen beliefs, suboptimal decisions about e-government investments are likely to be made. Specifically, some e-government services probably will be underutilized because there is not adequate demand for them. Given that such observations have been made about current e-government stage models, it seems that future research should build on the existing models but should not be enslaved by them.

29.4 Conclusion

Before beginning a major effort to refine key concepts and develop new conceptual models, it seems prudent to consider some foundational concepts and models that have been applied frequently in innovation and technology studies outside of e-government and e-governance. One potential resource is the Technology Acceptance Model (TAM), which focuses on individual perceptions about the usefulness of a technology as being influential in the usage of the technology and has been adapted for various settings [e.g., Venkatesh 2000]. Another possibility is the work of Klein and Sorra [1996; Klein, Conn, and Sorra 2001] focusing on innovation implementation, which was developed and tested originally in the context of engineering and manufacturing organizations, but has applicability to other settings as well.

Perhaps a good place to start, however, is Rogers' *Diffusion of Innovation* [2003], which of course is a seminal work in the field of innovation research. Rogers' work is both expansive and rich in detail, covering such topics as adopter characteristics, implementation in organizations, and consequences of innovation adoption. One particular concept that seems potentially promising is *technology clusters*: "distinguishable elements of technology that are perceived as being closely interrelated" [Rogers 2003]. Adoption decisions and the impacts of individual technologies occur within specific organizational contexts. The structure, priorities, financial resources, and work processes of the organization influence such decisions and impacts, as do the current information and communication technology (ICT) infrastructure and past experiences with technology adoption. Technology clusters might guide thinking not only about individual ICTs within the ICT infrastructure that form a cluster, but also non-technical innovations, such as novel management structures or quality improvement initiatives, that might be interrelated with an ICT.

Attempting to attribute impacts to a single ICT in isolation is often quite difficult and may be potentially misleading if other interrelated changes are also occuring. By analyzing the *cluster* of the ICT and other interrelated innovations, the impact may be better understood. After all, if we assume that ICTs have the ability to transform organizations (and transformation implies innovation), shouldn't it be the transformed version of the organization that is of interest when assessing

impacts, not the ICT itself? In this regard, the cluster perspective seems consistent with calls from some researchers to shift the view of e-government from a focus on the services provided to one that recognizes the interrelatedness of technological, institutional, and organizational change [e.g., Fountain 2001; Yang 2003]. Although studies adopting such a shift may be more complex and challenging to conduct than studies focusing on individual ICT initiatives, efforts to do so likely offer the best opportunity for advancing the field.

References

Brown, M.M. (2007). Understanding e-government benefits: An examination of leading-edge local governments. *American Review of Public Administration*, 37, 178–197.

Child Development Institute. (n.d.). Stages of intellectual development in children and teenagers. Retrieved June 18, 2009, from http://www.childdevelopmentinfo.com/development/piaget.shtml

Coursey, D. & Norris, D.F. (2008). Models of e-government: Are they correct? An empirical assessment. *Public Administration Review*, 68(3), 523–536.

Dawes, S.S. (2008). The evolution and continuing challenges of e-governance. *Public Administration Review*, 68, S86–S102.

Fountain, J.E. (2001). *Building the Virtual State*. Washington, DC: Brookings Institution Press.

Garson, G.D. (2003). Toward an information technology research agenda for public administration. In G.D. Garson (Ed.), *Public Information Technology: Policy and Management Issues* (pp. 331–357). Hershey, PA: Idea Group Publishing.

King, J.L. & Kraemer, K.L. (1984). Evolution and organizational information systems: An assessment of Nolan's stage model. *Communications of the ACM*, 27(5), 466–475.

Klein, K.J. & Sorra, J.S. (1996). The challenge of innovation implementation. *The Academy of Management Review*, 21(4), 1055–1080.

Klein, K.J., Conn, A.B. & Sorra, J.S. (2001). Implementing computerized technology: An organizational analysis. *Journal of Applied Psychology*, 86(5), 811–824.

Lourenco, O. & Machado A. (1996). In defense of Piaget's theory: A reply to 10 common criticisms. *Psychological Review*, 103(1), 143–164.

Nolan, R.L. (1973). Managing the computer resource: A stage hypothesis. *Communications of the ACM*, 16(7), 399–405.

Norris, D.F. & Lloyd, B.A. (2006). The scholarly literature on e-government: Characterizing a nacent field. *International Journal of Electronic Government Research*, 2(4), 40–56.

Rogers, E.M. (2003). *Diffusion of Innovations*, 5th ed. New York: Free Press.

Saebo, O., Sein, M.K., & Flak, L.S. (2008). The need for a cumulative tradition in egovernment research: Conceptualizing the fundamental entities. Discussion paper for the pre–ICIS SIG e–Gov workshop. Retrieved May 22, 2009 from: http://www.electronicgovernment.se/SIGeGOV/7_Sabo.pdf

Venkatesh, V. & Davis, F.D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186–204.

Yang, K. (2003). Neoinstitutionalism and e-government: Beyond Jane Fountain. *Social Science Computer Review,* 21(4), 432–442.

Index

C

D

E

F

G

H

I

J

O

Q

R

S

T

U

Information Technology

HANDBOOK OF PUBLIC INFORMATION SYSTEMS

THIRD EDITION

Delivering IT projects on time and within budget, while maintaining privacy, security, and accountability, remains one of the major public challenges of our time. In the four short years since the publication of the second edition of the **Handbook of Public Information Systems**, the field of public information systems has continued to evolve. This evolution has elucidated many issues that public sector managers must face as they wrestle with the information age. Completely revised and updated, the third edition addresses all aspects of public IT projects while emphasizing a common theme: Information technology initiatives are neither simple nor routine. These initiatives carry substantial implications for democratic values, policy development, strategic planning, and the mobilization of human capital.

The third edition elaborates on and provides further insight into significant issues such as:

- Network governance
- Cross organizational integration and operability
- Enterprise architecture design, development, and management
- The impact of information technology on government service delivery

With articles contributed by experts in the field, the coverage includes 21st century public information systems, modern IT needs, and the development of e-governments. The book examines the growth and use of information technology within and among government agencies and organizations. It examines current policy issues, offers case studies, and demonstrates successful public sector applications. Each section leads to a holistic approach that emphasizes communication, understanding, and participation from top management, technology teams, and end users.

K10387

CRC Press
Taylor & Francis Group
an informa business
www.crcpress.com

6000 Broken Sound Parkway, NW
Suite 300, Boca Raton, FL 33487
270 Madison Avenue
New York, NY 10016
2 Park Square, Milton Park
Abingdon, Oxon OX14 4RN, UK

ISBN: 978-1-4398-0756-9
90000
9 781439 807569