The Quest for High-Performance Administration

E-governance comprises the use of information and communication technologies (ICTs) to support public services, government administration, democratic processes, and relationships among citizens, civil society, the private sector, and the state. Developed over more than two decades of technology innovation and policy response, the evolution of e-governance is examined in terms of five interrelated objectives: a policy framework, enhanced public services, high-quality and cost-effective government operations, citizen engagement in democratic processes, and administrative and institutional reform. This summary assessment of e-governance in U.S. states and local governments shows that the greatest investment and progress have been made in enhanced public services and improved government operations. Policy development has moved forward on several fronts, but new policy issues continually add to an increasingly complex set of concerns. The least progress appears to have occurred in enhancing democracy and exploring the implications of e-governance for administrative and institutional reform. ICT-enabled governance will continue to evolve for the foreseeable future providing a dynamic environment for ongoing learning and action.

Over the past two decades, rapidly evolving information and communication technologies (ICTs) have permeated nearly every aspect of government, business, and daily life. Digital information has exploded in volume and diversity. It is created, shared, and used in myriad ways that can generate both public and private value. Communication networks span the globe, allowing individuals, groups, and organizations to interact regardless of time or location. However, the networked society is fraught with complexity and vulnerable to new threats—threats to stability, privacy, security, and stewardship. This environment of risk and opportunity presents continually evolving challenges for public service. Its effect on the public sector has been characterized in different ways, ranging from interesting but incremental change to “the next American Revolution” (Council for Excellence in Government 2001). While the full impact of these trends is not yet known, government is clearly different today than it was when the Winter Commission deliberated the future of state and local public service in 1993.

For American states and local governments, the technology-related concerns addressed in the 1993 Winter Commission report remain salient, but they now include important additional challenges. In the early 1990s, despite substantial deployment of computer technology in the back offices of government, most public officials usually communicated in person or by memo, letter, or telephone. Where office technologies existed, they comprised word processing, spreadsheets, and internal e-mail systems that generally worked only inside a single building. Communications among agencies and between levels of government still relied mostly on the delivery of paper mail. Today, the Internet, global e-mail, laptops, cell phones, and other mobile devices are ubiquitous forms of communication with and within government. Then, although many routine functions were supported by computerized transaction processing systems, most official government records were still maintained and preserved on paper. Today, public records are “born digital,” and many are at risk of disappearing. In the 1990s, a government database was almost always tied to one service or regulatory program operated by a single agency. Today, that same information is often transmitted over networks, carried on mobile devices, and made available for use beyond the original reason for collecting it. Simultaneously, the boundaries between organizations, sectors, and levels of government are becoming more permeable as information is used and reused in interconnected, overlapping organizational networks that often reach deeply into the nonprofit and private sectors. Citizens and businesses interact with government much more through e-mail, Web sites, and interactive voice systems, and much less in person or on paper. Government is even beginning to engage in virtual electronic worlds, crossing the boundary between physical and digital communities.
This article focuses on e-governance development in American states and local governments. It begins with a brief look at the evolution of e-governance development in the United States in terms of technology adoption, policy developments, and implementation priorities, with a particular focus on state and local governments. Highlights of the research literature and observations on efforts to assess e-governance are then presented. The article concludes with thoughts on a future research and innovation agenda.

**Historical Development: E-Government to E-Governance**

In the early 1990s, the “reinventing government” movement (Osborne and Gaebler 1992) called for radical change from bureaucratic government toward an entrepreneurial government that is enterprising, catalytic, mission and customer driven, and results oriented. Through the Clinton-Gore National Performance Review (NPR), reinvention became closely linked to the creative use of information technology (IT). Government agencies responded with early efforts to redesign work processes and support them with new applications of technology focused on the needs of “customers” rather than the needs or structures of agencies. The term “electronic government” was coined in this process. Elected officials began to promise to put people “online instead of in line” (NPR 1993) for convenient access to government.

“Digital government,” a term adopted by the National Science Foundation (1999), offered a somewhat wider view, focusing on the use of information and technology to support and improve public policies and government operations and to engage citizens, as well as to provide comprehensive and timely services. The definition of the Organisation for Economic Co-operation and Development is “the use of information and communication technologies, and particularly the Internet, as a tool to achieve better government” (OECD 2003), meaning the achievement of “better policy outcomes, higher quality services, greater engagement with citizens, and … advancing the public reform agenda” (OECD 2008). The World Bank (n.d.) adds to its definition, “citizen empowerment through access to information.” Taken together, these increasingly broad views include not only services and administration but also democratic processes and the relationships among citizens, civil society, the private sector, and the state. Collectively, they constitute what is coming to be understood as “e-governance.” E-governance can be examined in terms of five interrelated objectives:

- A policy framework—Information-related statutes and policies are the essential legitimizing foundation for e-governance. They set policy goals and specify the rules and conditions under which information is gathered, used, protected, and shared by government, individuals, and the private sector to achieve them.
- Enhanced public services—E-governance goals for service enhancements embrace a common-sense approach that replaces an organizational perspective with a customer orientation, providing access, convenience, and choice to citizens and businesses seeking information or services from government.
- High quality and cost-effective government operations—A wide array of managerial, professional, and technical improvement goals address not only efficiency but also infrastructure investments, information management and use, organizational innovation, risk management, procurement reform, workforce capabilities, and performance assessment.
- Citizen engagement in democratic processes—Often called “e-participation,” engagement covers the spectrum democratic processes. It includes accessibility and usability of technologies and information content, public interaction with government, public discourse on political topics, and public consultation, or the processes of engaging people in the agenda-setting process.
- Administrative and institutional reform—With an emphasis on accountability, transparency, and trust, reform pertains to the structures and processes of government as well as to the roles and responsibilities government delegates to the private and nonprofit sectors for carrying out public functions. Reform also addresses the culture of government and the way the public service perceives its role with respect to governance, citizens, and society.

The challenges of e-governance, then, go far beyond effective IT management, organizational adaptation, and technical competence, which were the prominent concerns assessed by the Winter Commission (Perry and Kraemer 1993). By 2008, ICT developments, and the tools to exploit them, had produced both economic and social changes that, in turn, prompted a substantial set of policy responses and associated government actions. Table 1 summarizes the coevolution of technology, policy, and practice in the United States over the past 20 years.

**Pre-1990: Technology and Policy Foundations**

Mainframe computing was the dominant information technology in government before 1990. While the personal computer (PC) emerged in 1989, it was not quickly adopted in the public sector. Instead, transaction processing systems (frequently associated with financial management and accounting) and rudimentary management information systems were common.
The information policy framework included attention to long-standing fundamental principles of access and privacy embodied in the Freedom of Information Act (1966) and the Privacy Act (1974). The original Paperwork Reduction Act (1980) laid the foundation for later information resource management policies, but its earliest form focused on reducing the paperwork burden that federal programs imposed on businesses and individuals (Relyea 2002). IT-oriented laws and policies mainly addressed procurement and the extensive planning and approval requirements associated with federal funding for major state-level
IT systems. To the extent that states had their own legal frameworks, they tended to follow or elaborate on the federal models.2

During this time, states invested in high-volume transaction systems associated with public assistance, Medicaid, and crime data. Management issues included technology integration, planning, end-user computing, data security, oversight, procurement, and the effects on jobs among others (Caudle, Gorr, and Newcomer 1991). Operationally, computing was the province of specialized IT departments either within line agencies or in a centralized data processing organization, often within a department of administration. Similar arrangements existed in some large cities and counties. Smaller local governments had little or no independent IT capacity (Andersen and Dawes 1991).

Early 1990s: Decentralization and Service Innovation
The infusion of IT into government jobs and workplaces had major impacts on skills, work processes, job design, organizational structures and controls, and the need for new kinds of policies and leadership behaviors (Perry and Kraemer 1993). With the early adoption of desktop computing, small stand-alone systems were increasingly deployed in program, policy, and administrative units. This development freed analysts and program managers from the limitations of highly structured and specialized mainframe systems and offered them tools for small and specialized applications. In the process, the PC instigated a sea change in the information processing skills of all kinds of government workers. PCs also contributed to the “islands” of unconnected information that remain a challenge for government today (Andersen and Dawes 1991).

Local area networks began to connect these small systems together, creating the foundation for limited information sharing. Meanwhile, in research labs, the early version of the Internet was undergoing rapid development, capped by the invention of the World Wide Web and the Mosaic Web browser (Tehan 1999), but neither made appreciable inroads into government until later in the decade.

At this time, the NPR (Gore 1993) and the subsequent Partnership for Reinventing Government laid important policy foundations. The IT goals of the NPR included electronic benefits transfer, access to government information, a national law enforcement network, and tax filing systems, as well information infrastructure investments and workforce development (NPR 1993). These goals were accompanied by extensive private sector outsourcing and contracting as well as important policy initiatives to better procure and manage technology. Legislative initiatives, such as the Government Performance and Results Act (1993), required agencies to measure, improve, and report performance to Congress and the public.

Mid-1990s: Networks, Service Expansion, and Management Innovation
By the mid-1990s, networks had become much larger in scope and capacity, but they were largely dedicated to specific functions or agencies. Many states operated different networks for public safety, education, human services, and other program areas. Within a few years, however, the commercialization of the Internet made it possible and affordable to begin to bring these networks together to run over shared “backbones.” Simultaneously, the earliest primitive public sector Web sites began to appear. E-mail moved gradually from proprietary and single-agency implementations to universal connectivity using the open protocols of the Internet.

With so much public spending being devoted to IT, additional policies, such as those embodied in the Clinger-Cohen Act (1996), mandated IT management improvements and a new leadership position, the chief information officer, which, in turn, were expected to produce better IT investment decisions and fewer problematic implementations. State and local chief information officers also became responsible for applying technology strategies and resources to overall government or agency missions—and for controlling the problems of failed systems and over-spending. Influenced by developments in the private sector, ICTs began to be viewed as strategic assets for government with the potential to help policy makers and program managers redesign and integrate services to support critical stakeholder relationships and overarching policy goals (Andersen, Belardo, and Dawes 1994). This movement was accompanied by an accelerating trend toward private sector contracting and outsourcing of IT functions that were considered to be more cost-effectively performed outside of government (Chen and Perry 2003; Prager 1994).

Policies were adopted during these years to modernize and expand public access to telecommunications (e.g., the Telecommunications Act of 1996) and to government information (e.g., the Electronic Freedom of Information Act Amendments of 1996). Assessments of the “digital divide” launched a series of reports on progress toward making communications and information available to all Americans regardless of location, income, or education (NTIA 1995). As the Internet and World Wide Web became widely available, e-government projects were launched across American government. Most early efforts were aimed at efficiency improvements and simplifications of paper-burdened processes, or they were modest attempts to put basic descriptive information online.
Later, agencies began to experiment with Web sites where visitors could find documents and information about agency structures and programs. Digital communication, via e-mail or Web forms, allowed visitors to begin to interact electronically with government organizations. Subsequently, electronic services to citizens became the exemplar of e-government, focusing on electronic transactions in which individuals could actually conduct some kinds of business with government, such as paying fines or taxes, applying for a student loan, or renewing a driver’s license. These electronic services were (and continue to be) strongly influenced by private sector initiatives in electronic commerce and by rapid development and deployment of emerging technologies throughout society.

**Late 1990s: Service Expansion, Information Management, and IT Management Consolidation**

In the late 1990s, the adoption of the Web moved forward rapidly at all levels of government. New capabilities such as wireless networks and advanced search tools pushed both the demand for information and the development of a wide variety of Web-based applications and information sources. Increasing numbers of geographic information systems, as well as data mining and other analytical tools, were adopted. Data cooperatives, such as the one operated by the New York State Geographic Information System Clearinghouse (see http://www.nygis.state.ny.us/gisdata), began to create shared data repositories built around formal sharing agreements as well as common standards for description and application. In criminal justice, statewide information management projects were formed in nearly all states. In Pennsylvania, for example, the JNET initiative, launched in 1998, developed into a statewide information management infrastructure for justice applications across more than 15 agencies at all three levels of government. These cross-boundary initiatives brought with them a critical need for joint governance structures in which multiple agencies share decision making, costs, and benefits.

Significant new technology risks appeared. Network-invasive computer viruses prompted awareness, education, and monitoring efforts and led to a market for new products to protect information and systems from hackers and other threats. The millennium date change from 1999 to 2000 posed the possibility that essential systems might fail if they miscalculated the date change to a new century. In response, the federal government, states, and industry groups mobilized a nationwide initiative to prepare for “Y2K.” This provided the opportunity for states and local governments not only to review and repair their information systems in anticipation of the date change but also to undertake some substantial modernizations as old systems were upgraded, replaced, or discarded altogether. Y2K remediation emphasized enterprise-level IT planning, infrastructure, and resource management. As one outcome, the federal government, states, and large localities began to adopt enterprise architectures that are essentially blueprints for rationalizing, managing, and developing information and communications investments and operations as government-wide assets. Statewide strategic IT plans became common ways to set direction and measure achievements related to IT management.

Substantial policy development at this time addressed infrastructure protection (White House 1998) and online privacy protections for children (e.g., the Children’s Internet Protection Act of 2000) and consumers (e.g., the Credit Reporting Reform Act of 1996). A continuing concern with access was embodied in the amendments to section 508 of the Rehabilitation Act (1998), which required that online government resources be made accessible to people with disabilities. In addition, promotion and regulation of electronic commerce led to the adoption of standards and guidelines governing the use of digital signatures and the authenticity of electronic records (e.g., the Government Paperwork Elimination Act of 2000).

**Post-2001: Security, Consolidation, Information Sharing and Preservation, and Elections**

By 2001, the Office of Management and Budget was reporting annual federal government investments in IT at $45 billion (OMB 2001). With large states spending more than a billion each (NASCIO 2005), the total annual IT investment across all levels of government can be roughly estimated at around $100 billion. Major e-government initiatives in states and many localities addressed more kinds of online citizen services and a variety of back-office administrative operations such as financial management, payroll, and accounting, as well as program operations such as eligibility determinations and benefit payments. The 2000 presidential election sharply focused attention on voter registration and election technologies as well as extensive use of ICTs for campaigns and political discourse, all of which have increased substantially through subsequent election cycles.

Immediately after September 11, 2001, the citizen service and management improvement orientations of e-government were temporarily displaced by a sharp focus on security. With the passage of the USA PATRIOT Act (2001) and related state and local public safety priorities, large portions of state and local plans for continued e-governance development were put on hold while resources were redirected to cybersecurity. Gradually, policy makers turned their attention back to electronic services, while maintaining an emphasis on homeland security, first-response technologies, and online threats to organizations and individuals.
Today, Web-based information technologies continue to proliferate and strongly influence the information environment. For example, extensible markup language, or XML (World Wide Web Consortium n.d.), makes it possible to convert information among many different display formats without losing coherence, structure, and meaning (Gil-Garcia et al. 2007), assisting information sharing across both systems and organizations—a major theme in most policy domains. Other technical standards, such as open document format, help ensure that government records are accessible on different platforms and applications and across succeeding generations of technology (ODF Alliance n.d.), thus providing an improved foundation for electronic records management and digital preservation. At the same time, IT consolidation and centralization continue to figure prominently in the IT management agenda. Finally, the growing collection of tools characterized as “Web 2.0” (e.g., blogs, wikis, social networking, and virtual worlds) provide for user-initiated information sources, exchanges, and dialogues about public issues that complement, and to some extent compete with, government sources and services.

**Current Issues for States and Local Governments**

Today, the leading e-governance issues for state and local officials are more complex and more deeply embedded in social and organizational context than ever before. Networks continue to connect vast amounts of data from an increasing number of sources, with impacts on the social, political, and economic geographies of governance. Security has taken on renewed importance associated with increasing dependence on massive data bases and networks and the related need to protect individuals, organizations, systems, and infrastructure from fraud, errors, hackers, and attacks. At the same time, concern for service delivery, effective management, IT investments, and public access all continue to receive leadership attention.

The array of concerns and priorities presented in table 2 is drawn from the Web sites (as of January 2008), recent conference programs, and recent publications of nine national associations of state and local officials: the Council of State Governments (CSG), National Association of State Chief Information Officers (NASCIO), National Conference of State Legislatures (NCSL), National Governors Association (NGA), International City/County Management Association (ICMA), National Association of Counties (NACo), National League of Cities (NLC), Public Technology Institute (PTI), US Conference of Mayors (USCM), and Electronic Commerce Coordinating Committee (eC3).

In all cases, e-governance-related topics are among the major themes listed on these organizations’ home pages or located by simple searches. Some, such as security, cross both branches and levels of government; others, such as broadband deployment and e-commerce concerns, are more specific to certain offices. None of the organizations expresses an explicit priority of issues. Accordingly, the topics listed in table 2 are given in alphabetical order. Nevertheless, a rough approximation of priority can be discerned from the number of resources devoted to each topic by each organization. These resources include research reports, briefing papers, best practice guides, white papers, and toolkits produced or posted between 2005 and mid-2008. By this rough measure, *security* is the most pervasive theme (a total of 33 resources on these topics appear across these organizations). Whether labeled as computer security, cybersecurity, homeland security, Internet crime, or another similar name, security is a major focus for executive, legislative, and technology leaders.

Privacy and identity constitute a second major area of concern for both states and local governments and across executive, legislative, and technical perspectives (28 resources). Privacy is viewed as an essential component of trusted interactions in commerce, health care, digital communications, financial matters, education, and many other areas. Personal identity and the ability to authenticate and protect it are issues in the design and delivery of personalized services as well as requirements for electronic commerce and controlled and trusted access to systems, services, and information.

An equally common theme is IT management (representing 28 resources), most often expressed as *enterprise IT management*, which treats government as a whole, devising an IT strategy, infrastructure, and policy framework that favors jurisdiction-wide benefits and interagency cooperation over the needs of individual departments or programs. IT consolidation and shared services, as well as IT investment and procurement processes, are part of this theme. IT leadership positions and governance structures are also prominent, usually focused on the roles and responsibilities of chief information officers and CIO councils. IT workforce concerns also figure prominently as governments consider how to deal with changing skill needs and workforce demographics. The *IT value proposition* is implicit in many of the topics addressing cost–benefit calculations of IT spending as well as...
attention to the larger public value potential for IT initiatives to return strategic, political, and social benefits (Cresswell, Burke, and Pardo 2006).

**Citizen access and engagement**, including concerns for closing the digital divide, broadband deployment, public comment, and community discourse, appears as a fourth theme (25 resources), concentrated in legislatures and local governments. However, these resources represent only modest attention to the processes of democratic participation. They mostly focus on one-way communications (e.g., legislative Web sites, broadcasts, e-mail management) rather than interactive discussion or deliberation. The dominant focus in this category is on building and regulating the infrastructure for such activities through broadband deployment, municipal wireless systems, and regulation of telecommunications.

**Collaboration, information sharing, and integration** constitute a fifth theme (16 resources). Often some of the information that an agency needs to plan, make decisions, or take action is held by other public or private organizations, collected for widely different...
purposes, and maintained in disparate formats. Environmental management, criminal justice, health care, and emergency response are a few of the areas in which information sharing and integration are becoming essential to effective performance. These integration efforts are technologically, organizationally, and politically challenging and therefore often involve the need for cross-boundary governance structures, new work processes, and significant policy attention, as well as technical tools and organizational change that respond to the needs, capabilities, and limitations of multiple organizations.

The last major theme is information management, use, and preservation, including electronic records and archives (16 resources). These issues address information quality, authenticity, and stewardship, as well as strategies for effective information collection, storage, management, and access by government and others. They also include concerns for electronic documents, databases, transaction records, e-mail, and multimedia material that need to be archived and protected for future users even while the technology that created them may change or disappear. "E-discovery," or the process by which electronic data is sought for use as evidence in a civil or criminal proceeding, is the latest information management challenge to confront government agencies (NASCIO 2007b).

Assessing Progress toward E-Governance

Against this historical and practical backdrop, we can begin to examine the extent to which the developments in U.S. states and local governments address the full set of e-governance objectives: a policy framework, enhanced public services, high-quality and cost-effective government operations, citizen engagement in democratic processes, and administrative and institutional reform. This section summarizes the extent to which state and local government practice has achieved these goals, as well as the extent to which associated research has contributed to understanding them. Since the mid-1990s, thousands of e-governance initiatives have been undertaken, and an equally large number of research projects and papers have been produced. Different patterns of concern are evident in different places and disciplines; for example, European officials and researchers are much more likely to focus on democratic participation than their American counterparts. The intent here is not to survey exhaustively all e-governance research and practice but to highlight and illustrate the prominent themes for American states and local governments.

Action and Research Agendas

The action agenda is well-represented by the state and local government associations listed in the preceding section. These are heavily weighted toward management improvements and service enhancements, with some attention to policy and citizen engagement concerns. The same pattern is echoed by the National Electronic Commerce Coordinating Council (e3c), a consortium of mainly state and local government organizations that sponsors numerous working groups and white papers, as well as an annual symposium on the most important issues associated with electronic governance. Nine symposia focus on improving management and service (an electronic commerce guide for states, e-government strategic planning, enterprise e-government, leveraging e-government for economic competitiveness, cross-boundary integration, e-government "reality" assessment, strategic sourcing, transforming the back office, digital archiving). Two focus on policy needs and broad social change (the implications of social networking and policies for privacy and public access to information).

The introduction to a recent volume of case studies drawn from practical experiences (Rocheleau 2007) summarizes 10 crosscutting themes that reflect the same emphases. Eight pertain mostly or entirely to management and operations (IT governance, sharing, leadership, planning, accountability, management of processes and human resources, procurement, and communication and marketing). The others address policy and institutional issues (ethical and legal issues and IT and politics).

As early as the mid-1990s, researchers were exploring the idea of electronic services and identifying associated issues that persist until today. These include concern for technology-driven initiatives that overlook the human element, fail to meet public needs, or exacerbate the gap between "haves and have nots." Other issues include a lack of management capacity and incentives for innovation, inadequate infrastructure, and outdated information policies (OTA 1993).

The current research agenda is influenced especially by several workshops sponsored by the National Science Foundation (NSF) as it established its digital government research program. The first (Schorr 1997) recommended a computer science agenda to address such issues as storing, archiving, finding, accessing, and integrating information. Subsequently, the Computer Science and Telecommunications Board (2002) of the National Research Council recommended an agenda that would both build the IT capacity of government and address government's needs as a customer for IT innovation.

A second NSF workshop (Dawes, Bloniarz, and Kelly 1999) brought information scientists, social scientists, and federal, state, and government managers together around the innovation needs of government. It identified such priorities as interoperable systems that are trusted and secure, as well as models for electronic public services, citizen participation, and public–private
partnerships and other networked forms of organization. The report emphasized the need to integrate policies, processes, information, and technology, and to recognize that initiatives that are technically possible may not be organizationally feasible or politically or socially desirable.

A third NSF workshop (Fountain 2002), on the social science research agenda, gave particular attention to institutional factors. It addressed the impact of technology on the structures and processes of government, mutual adjustment between technology and organizational responses, the impact of information-based organizations on institutional structures such as oversight and accountability, and the developmental processes of e-government.

Assessment of E-Governance Research and Practice
A variety of approaches have been used to define, build, and assess the development, performance, and consequences of e-governance. These include experimentation with new IT tools, performance and capability assessments and improvement efforts, and model and theory-building work. Taken as a whole, at least some progress has been made toward each of the five e-governance objectives. The most progress by far has been made in enhanced public services and improved management. Policy development has continued to move forward, although new policy issues continually add to an increasingly complex set of questions. The least progress appears to have occurred in enhancing democracy and exploring the implications of e-governance for administrative and institutional reform.

Progress toward a policy framework. Government information policies address both the utility of information and requirements for stewardship (Dawes 1996). The e-governance policy framework today addresses information access, security, privacy, technology management, procurement, commerce and consumers, the digital divide, and oversight requirements (Relyea 2002; UCLA 2008). The National Conference of State Legislatures records scores of state statutes pertaining to broadband, privacy, computer crime, Internet taxation, identity systems, consumer protection, and related topics. However, despite these many topics, the legal and policy landscape is uneven and relatively unstructured, without a fundamental perspective on information as both an object and an instrument of public policy. Moreover, the framework has important gaps, especially considerations of federalism (Jaeger 2002). The implications for federalism are illustrated in ongoing conflict between the states and the federal government over the cost, form, and consequences of e-government.

The security aspects of access to government information have become an ongoing policy concern as governments at all levels have sought to protect information resources and infrastructures. Considerable resources and attention have been invested in coordinated security measures such as the Multi-State Information Sharing and Analysis Center, a voluntary organization of all 50 states and the District of Columbia to provide a common mechanism for state and local cybersecurity readiness and response (MS-ISAC 2005). By contrast, on the policy front, researchers have concluded that the lack of strong legislative guidance on access to government information has left federal agencies and states to devise their own uncoordinated rules (Feinberg 2004) for balancing security concerns with the principles of access and transparency.

At the same time, technology initiatives have pushed the policy agenda forward in some areas, particularly with respect to the digital divide, transparency, and universal access. Municipal wireless projects such as the ones in Philadelphia (Jain, Mandviwalla, and Banker 2007), San Francisco, and elsewhere are addressing these topics—and in the process, they are testing the limits of public and private roles and responsibilities for providing access to electronic information and services.

Progress on enhanced public services. Enhanced services are inarguably the most advanced dimension of e-governance in the United States. The best-known assessments comprise widely publicized studies that rank or grade states or local governments on selected features or indicators of e-government performance. These studies attempt to identify objective measures of progress or performance and typically rely on external observations of Web sites or surveys of government IT officials.

Brown University has conducted seven annual reviews of the features of online state and federal government services (West 2007). The sites are evaluated for the presence of features considered to be indicative of advanced e-government, including online publications and databases, disability access, privacy protections, credit card payments, and personalization. The biennial Digital States Surveys (Center for Digital Government 2006) take a somewhat deeper look at state-level
e-government implementations, assessing not only features and functions available online but also the extent of “take-up,” or the degree to which these services are actually used by businesses and individuals. The 2007 study also assessed states on infrastructure, collaboration, and leadership and concluded that the best performers combine improved service delivery, enhanced capacity, and lower costs. While both studies produce rankings, implying significant differences, the real differences among the states are diminishing substantially, with most states exhibiting most of the selected characteristics.

Capability assessments take a governmental perspective rather than a user or observer perspective. One study (Kaylor, Deshazo, and Van Eck 2001) was organized according to the typical functions and services that cities provide (e.g., payments, permits, licenses) rather than the design or organization of city Web sites (e.g., navigability, personalization, esthetics or ease of use). On this basis, the cities with the highest ratings offered online transactions, access to documents, multimedia features and online participation through surveys, forums and electronic meetings. In general, smaller cities scored lowest on these criteria.

Two surveys of 2,600 municipal and county governments (Edmiston 2003) found that although the vast majority of local governments had established Web sites, very little had been done to integrate e-government into their daily affairs because of marketing, privacy, and funding barriers. Generally, municipalities had achieved more than counties. Another study (Norris and Moon 2005) concluded that the number of local governments adopting Web sites is growing rapidly, with higher rates of adoption among larger governments. However, few local governments reported any impacts from e-government, and most lacked sophistication mainly for lack of technical resources and funding. Privacy and security concerns appeared to be on the rise.

**Progress on improved management and operations.** Most state and local management improvement work has taken traditional forms. Management policies have generally followed the direction of enterprise IT management, including central leadership, distributed implementation, and shared governance. However, some experiments with new Web tools are also under way using internal wikis (informal online collaborative spaces) and blogs to share ideas and improve collaboration.

Management report cards have been used in this area to assign letter grades to state and local performance based on predefined indicators. The best-known report card on IT management is part of the Government Performance Project sponsored by the Pew Center on the States (2007), which relies on both published data and surveys of state officials. E-government, one of many elements of evaluation, is assessed on the basis of public access to information about the state government and the performance of programs and services, as well as the ability of citizens to provide input to policy makers. E-government is part of a larger assessment category called “information” that also includes the role of information in strategic planning, budgeting, performance management, and program evaluation. In the 2005 study, most states garnered a B or C grade. Earlier versions (Reed 2005), which also looked at counties and cities, concluded that higher-performing states and local governments were characterized by standardized and integrated architectures, stakeholder-driven strategic plans, top executive support for IT as a contributor to performance, use of the Internet to enhance citizen participation, modernized procurement processes, and training for users and IT specialists.

Government IT workforce and skills assessments have addressed state employee decisions about turnover (Kim 2005), the skills profile and future skill needs of an entire state government (Dawes et al. 2006), and the views of IT leaders on the workforce challenges associated with both an aging workforce and changing technologies (NASCIO 2007c).

Other research studies look more deeply at certain kinds of capabilities with the goals of improvement and assessment. Extensive action research with criminal justice organizations, for example, has produced multidimensional capability models that assess both individual organizations and multorganizational projects on such dimensions as readiness, governance, information quality, project management, technical skills, and infrastructure (Cresswell et al. 2005). Related studies have addressed capabilities and strategies for cross-boundary information sharing and interorganizational collaboration (Dawes and Pardo 2002; Pardo and Tayi 2007) and the roles of leadership and authority in cross-boundary e-governance programs (Eglen, Dawes, and Schneider 2007). Other research of this kind addresses access to and preservation of digital government information (Pardo, Burke, and Kwon 2006), development and ongoing use of digital libraries (Weaver et al. 2007), and the importance of business process innovation and change (Scholl 2005).

Work that aims to improve management performance and capability also includes case studies and awards programs that attempt to identify and publicize exemplary practices. Published case studies cover such topics as the management of state Web portals (Franzel and Coursey 2004), procurement innovations (Krysiak et al. 2004), mobile technologies (Moon 2004), e-government performance measurement (Stowers 2004), and critical success factors (Seifert and McLoughlin 2007).
Awards programs such as Innovations in American Government (Government Innovators Network 2008) highlight technology innovations considered to be exemplary attempts to deal with pressing public problems. Since 1986, more than 20 IT-intensive programs have been among the approximately 10 state and local award winners selected each year. Winning programs (selected after nomination, self-assessment, and independently conducted site visits) include CompStat (New York City’s widely replicated program of data-driven policing), CitiStat (Baltimore’s expansion of the idea to a citywide performance measurement program), and Info/California (a pre-Internet experiment to consolidate government information and services at kiosks in public places). Other award programs, such as the Best Practice Awards (NASCIO 2007a) and the Technology Solutions Awards (PTI 2007) rely on a peer-review process and highlight exemplary achievements in IT leadership, collaboration, innovation, enterprise management, project management, and similar topics.

In terms of explanatory theories and models, maturational perspectives or “stage” models (Layne and Lee 2001) are most prominent. These posit that e-governance moves through predictable stages starting with simple presence or publishing on the Web and moving to interactions, transactions, and ultimately “transformation.” Another common model focuses on rational planning and advancement through incrementalism, especially to avoid expensive failures (OECD 2001). Like rankings and report cards, these maturation models offer the advantage of simplicity and they are easy to communicate. However, they are being challenged by newer research that addresses the complexity and dynamics of e-governance.

These alternative models include technology enactment (Fountain 2001), which explores the mutual influences of technology development and institutional constraints, and collaborative organizational approaches (Brown and Brudney 2004), which actively sense and adjust to the environment. A strengths and weaknesses model (Streib and Willoughby 2005) argues that the ideal conditions for e-government include slack resources, skilled staff, and knowledgeable leaders; a sociotechnical view (Welch and Pandey 2006) considers both technology tools and bureaucratic characteristics. Adaptation models (Zhang and Dawes 2006) account for learning and experience, and strategic choice models (Yang and Melitski 2007) focus on choices among internal and external orientations and efficiency versus effectiveness. Service-oriented models emphasize a shift from a bureaucratic paradigm of efficiency, rationality, hierarchy, and centralization to a new paradigm that emphasizes user satisfaction, networked organizations, flexibility, and coordination (Ho 2002). Work at the local level suggests that maturation plays some role, but choice, external influences, and nonlinear processes of development are more useful in guiding action (Brown 2007).

**Progress toward citizen engagement.** Some states have adopted policies that open government deliberations to public view and modest interaction, as illustrated by a variety of technology initiatives in state legislatures. These include communication channels to and from legislators via e-mail, Web sites, blogs, newsfeeds, broadcasts and webcasts. A 2007 executive order requires New York State agencies to Web cast public meetings and archive them for later viewing. Citizen engagement is also the subject of experiments with digital technologies. For example, the California Department of Motor Vehicles posts driver training videos on YouTube in an effort reach Web-savvy teens.

Research contributions include both computer-mediated planning tools (O’Looney 2003) such as UrbanSim, a simulation tool for participatory urban planning (Waddell and Borning 2004), and case studies and methodological work exploring different facilitation techniques and their results for encouraging public participation or managing and using public input in government decision making (Friedman et al. 2008; Quinn and Ramasubramanian 2007; Stark and Girard 2007).

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A review of best state and local practices in citizen participation (Holzer, Hu, and Song 2004) found that successful efforts treated citizens as customers, and they recognized, encouraged, and enabled engagement in public affairs through mechanisms for direct participation. The best practices emphasized accountability, deliberation, and the character of “digital citizenship.”

Despite these practical initiatives and innovative experiments, citizen engagement receives much less attention in practice than services or management concerns. Little formal policy making has occurred to require, encourage, or guide proactive consultation with citizens or innovative forms of public engagement in government decision making. A survey of the Web sites of the 100 largest U.S. metropolitan areas looked at their potential for enhancing public engagement through representative, pluralist, and direct democracy theories. Findings showed these sites offer a great deal of diverse, low-cost information...
for interested and motivated users. But very few sites facilitated online dialogue or consultation, and they generally lacked policies and procedures to support Web-based public involvement (Scott 2006). Moreover, other work demonstrates that the elitist tendencies of the Internet makes policy deliberations less inclusive than traditional methods (Rethemeyer 2006).

Electronic voting is an exception to the generally low level of government attention to citizen engagement. Since the 2000 presidential election and passage of the Help America Vote Act in 2002, states have moved rapidly to choose and implement new administrative processes and election technologies, with mixed results. Researchers have studied various aspects of e-voting including security (Kohno et al. 2004), operational and cost considerations, complexity and reliability (Moynihan 2004), and user interfaces (Herrnson et al. 2008). In the field of political communication, a growing literature explores the use of ICTs by candidates and campaigns and in online public discourse about elections and campaign issues (Fountain 2007).

**Progress toward administrative and institutional reform.** Both scholars and political leaders have argued that IT can lead to radical administrative reform and institutional change. However, empirical research conducted through the 1990s suggests that IT by itself does not drive reform but instead fosters incremental change within traditional structures of power and authority. Productivity, adaptability, and innovation have been part of the legacy of IT in government, but these have played out without radical changes in structure or power relationships, which have received scant research attention (Kraemer and Dedrick 2003).

The ongoing development of the Internet may eventually lead to a different conclusion, but early policy research (e.g., Rethemeyer 2006) indicates that Internet-enabled policy networks reinforce existing patterns of influence rather than encourage new voices. Web 2.0 technologies, which are controlled by users and operate outside established structures, may reverse this direction, but more time and experience will be needed to test that possibility. Other research indicates that while technology has some influence over institutional imperatives, those same imperatives clearly limit the applications and uses of IT to those that by and large fit the prevailing institutional framework (Fountain 2007).

In practical terms, state and local governments have moved back and forth along the centralized–decentralized continuum with respect to structures and policies of IT management. They have also pressed for leadership attention, productivity gains, organizational realignments, and process innovations. All of these represent change, and, in many instances, substantial improvements, but none yet rise to the level of serious reform. However, the emergence of permanent cross-boundary, multiorganizational structures for policy making and action may represent one area in which administrative reform in the more radical sense is unfolding.

**The Future Research and Innovation Agenda**

In terms of public management, e-governance has evolved rapidly from rudimentary use of ICTs to support for highly structured administrative processes, to infusion of technology throughout government offices, and to reliance on networks and other advanced tools to change the way services are delivered and governmental processes are carried out. At the same time, new management approaches and governance structures have been developed to fit better with networked forms of organization. Government has also been made more accessible through investments in usability, accessibility policies and tools, and investments in information-rich Web sites, online transactions, and municipal networks. In terms of democracy, e-governance has proceeded more slowly, with the prominent exception of political campaigns and e-voting. Although there is great potential for citizen and civil society engagement, as well as for public consultation and political discourse, relatively few state and local jurisdictions have adopted or promoted these aspects of e-governance. E-governance research in these areas tends to follow these same patterns, although cross-disciplinary and international research provide a broader literature, especially for democracy-related topics.

Given the nature and pace of technological change, ICT strategies, tools, and innovations will continue to shape the information environment of governance. The inevitable interactions among technology development, social trends, policy responses, and public management adaptations will continue to provide a dynamic field for learning and action. Consequently, the implications of technological change on the nature, structures, and processes of governance will remain a ripe area for both academic research and government innovation. As technology ceases to be seen as something apart from the normal processes of governance, it is likely that “e-governance” will fade as a term of art. However, a steady stream of questions regarding the nature and impact of ICTs on public services, government administration, democratic processes and the relationships among citizens, civil society, the private sector, and the state is likely to remain.

Despite a popular tendency to assume the existence of a “best” form, many different forms of ICT-enabled governance are possible, and each will have attendant priorities, costs, benefits, and consequences. A future
Despite a popular tendency to assume the existence of a “best” form, many different forms of ICT-enabled governance are possible, and each will have attendant priorities, costs, benefits, and consequences.

Notes

1. The policy topics are primarily illustrated with federal legislation because these laws are well known; however, hundreds of similar and derivative state and local laws and policies have been enacted to deal with these issues in specific states or localities. See, for example, the listings of enacted and proposed state laws regarding computer crime, protection of children, electronic commerce, identification systems and other topics on the Telecommunications and Information Technology pages of the National Conference of State Legislatures’ Web site at http://www.ncsl.org/programs/lis/cip/infotech/infotech.htm [accessed August 6, 2008].

2. For example, all states have some combination of freedom of information, open records, and open meetings laws. See the compilation at the Missouri School of Journalism Freedom of Information Center at http://infoic.org/foi-center/state-foi-laws.html [accessed August 6, 2008].


4. By contrast, in 1993, the major themes appearing in annual conference reports of the National Governors Association included 13 policy positions, only one of which is loosely related to e-governance: an intergovernmental approach to science and technology policy. The Council of State Government’s cumulative index of suggested state legislation shows two technology themes for 1993: required information disclosures to protect consumers in such areas as real estate transactions and health care and authority to maintain public records on optical disk. The National Association of State Chief Information Officers (then called the National Association of State Information

5. A research team at the University of Washington’s Information School maintains a sharable database of international digital government research papers and conference proceedings published in English, which numbered more than 2,300 as of January 2008. The database is accessible through the Web site of the Digital Government Society of North America at http://www.dgsociety.org/library.php#endnotes [accessed August 6, 2008].


References


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