

# Electronic Government Strategies and Research in the U.S.

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## INTRODUCTION

Since the mid-1990s, adoption of wide-area computer networks, such as the Internet and the World Wide Web (WWW), by the public, educational institutions and private sector organizations has helped spur an interest in using these new Information and Communication Technologies (ICT) as a means to increase the efficiency and effectiveness of organizational processes. Private sector firms have focused on using Internet-based technologies, especially the browser-based technologies of the WWW, as a means to conduct business transactions. The use of such electronic transmission technologies in carrying out business activities has generally been dubbed electronic commerce, or e-commerce (Schneider, 2003). Attempts to reinvent public organizations in the United States during the 1990s were heavily grounded in the belief that the adoption of new forms of ICT will streamline both service generation and delivery (Osborne & Gaebler, 1993; Gore, 1993). Some government actors and observers, such as the National Science Foundation, have more recently referred to the overall use of ICT to carry out the activities of government institutions as digital government. The term *digital government* has in many respects grown to refer to the development, adoption or use of ICT as a key component of a public organization's internal information and control systems, as well as any use of ICT to facilitate interaction with external stakeholders. Some scholars have attempted to examine how governments have used ICT systems, such as the Internet and WWW, as a means to facilitate interactions with citizens and other stakeholders in an attempt to foster democratic processes via electronic media. These activities have been called electronic democracy, or *e-democracy*. This broad concept is then usually subdivided into two subsets of activities, electronic politics and electronic government. Electronic politics, or *e-politics*, centers on activities that facilitate civic awareness of political processes, as well as the ability of citizens to participate in those processes. Electronic government, or *e-government*, includes the

use of ICT by government agencies to provide programmatic information and services to citizens and other stakeholders (Watson & Mundy, 2001).

## CURRENT E-GOVERNMENT STRATEGIES AND APPLICATIONS

While the use of ICT in public organizations is far from a new phenomenon, using them to communicate directly with, and provide services directly to, government stakeholders is a relatively new occurrence. Since the Internet and the hypertext-based WWW provide a ready-made communication system that can be accessed and navigated with the use of graphical user interfaces (GUIs), such as the now ubiquitous browser, a great deal of attention has been focused on how such ICT can be employed strategically to alter traditional linkages with various government stakeholders, as well improve intra-organizational activities. In regards to external linkages, these strategies can be organized into one of many activities focused on altering government interaction with citizens, business, or other government entities.

### Government-to-Citizen (G-to-C) Activities

Communicating with the citizens served by public organizations, may include developing an organizational website with information about government programs, as well providing additional methods of communicating with public employees. In addition, it is now quite common for citizens and other stakeholders to pay taxes, pay license fees, or conduct other transactions with public organizations via ICT. Such activities streamline traditional transactions between government and stakeholders, therefore, providing an opportunity for increased levels of government accountability, as well intra-organizational efficiency. More advanced G-to-C activities include providing another means for citizens to become involved in

various political processes. For example, several federal regulatory agencies, such as the Environmental Protection Agency (EPA) and Federal Communications Commission (FCC), are developing new methods of allowing citizens to participate in regulatory activities, such as rulemaking, through the use of Internet-based systems.

### **Government-to-Business (G-to-B) Activities**

While business firms also benefit from the ready accessibility of basic programmatic information, the potential to conduct electronic transactions via the Internet is perhaps of greatest interest to businesses that sell goods and services to public organizations. It is important to realize that various government purchases account for a sizeable percentage of all goods and services sold each year. Federal executive agencies alone purchase over \$200 billion worth of goods and services each year. Agencies such as the General Services Administration (GSA), with its Federal Procurement Data Center, are making use of new forms of ICT in order to process and track governmental purchases. Moon (2002a) indicates that many state governments are also attempting to use ICT to improve procurement systems. For example, many states now post solicitations for bids online, make use of electronic ordering, are automating procurement systems, and are adopting purchasing cards. State governments, however, have been slower to adopt the use of digital signatures, Internet-based bidding, or reverse auctions.

### **Government-to-Government (G-to-G) Activities**

The enhanced communication and information sharing capabilities of new ICT among a set of public organizations with similar goals is often seen as a major reason for adopting such technologies by public agencies. This is especially true in certain functional areas, such as law enforcement and national security. For example, many law enforcement organizations maintain crime databases that are not readily shared outside of their jurisdiction. Some state-level initiatives, such as the Justice Net project in Pennsylvania, have attempted to overcome the social and technical barriers of sharing databases maintained by local, state, and federal government agencies. At the federal government level, the perceived need for increased coordination in response to national security concerns was a primary reason for the reorganization of several established agencies under the institutional umbrella of the Department of Homeland Security (Yen, 2004). As such institutional reorganizations take place, heightened levels of technical congruencies in regards to ICT are

sought to as a means of enhancing social coordination both within and between government organizations.

### **Development of E-government Applications**

The traditional approach to developing and deploying ICT to support and enable government activities was to devise purpose-built specialty systems (Danziger, Dutton, Kling, & Kraemer, 1982). In recent years, governments also have been increasing employed Commercial Off-The-Shelf (COTS) products. This latter trend in systems development has been spurred on as digital technologies have become more powerful, incorporated Internet capabilities, and become more reliable. This dual approach of ICT development – purpose built systems to support the specialized functions of government (such as voting and public safety) and attention to COTS (to support human resources, payroll, and other operational processes) – are both representative in current attempts to development e-government applications.

The use of COTS in e-government has often focused on the emphasis on implementing Enterprise Resource Packages (ERP) to support large scale transaction processing and operational activities. Such efforts with respect to ERP are emblematic of the move towards developing and adhering to concepts of enterprise-wide architecture and systems standards within large public organizations (NASCIO, 2002). The adoption of such technologies in an attempt to enhance government operations has also spurred more attention towards efforts focused on integrating commercial ICT into an organizations social structure. Purpose-built systems are often developed for a myriad of advanced Internet-based applications since their goals are usually unique to governmental functions. For instance, the delivery of complex government information to external stakeholders has been a focus of specialized application systems such as those used to allow for enhanced visualization of large federal data sets (MacEachren, Hardisty, Dai, & Pickle, in press). Likewise, increased interest in online voting has initiated development of ICT-based voting systems that are intended to support e-democracy and bring about greater civil engagement (Chadwick, 2004). Whether designed to enhance G-to-C, G-to-B, or G-to-G activities, increased interest in using ICT to support governmental activities made the development of e-government applications a vibrant and innovative sector of the broader IT industry.

Researchers believe that the adoption of e-government strategies, as well as the development of specific applications, will evolve over time, noting that certain types of activities, such as posting basic program information, are relatively simple practices to adopt; while

other activities, such as the processing of financial transactions (taxes, license payments, etc), require more technical capacity and sophisticated knowledge of information management. West (2004) highlights five stages of e-government evolution that correspond to real transformation in regards to how public organizations operate. These stages including the *billboard* stage in which public organizations focus primarily on providing programmatic information to stakeholders, the *partial-service delivery* stage in which public organizations offer some online services, the *portal* stage in which information and services are integrated, and *interactive democracy* which would offer online methods of public outreach, such as two-way communication. Other researchers, such as Moon (2002b), conceptualize e-government evolution into five stages. These include *information dissemination, two-way communication, service transactions, vertical and horizontal integration, and political participation*. Regardless of the conceptual framework, the core belief is that public organizations will adopt more advanced e-government strategies and applications over time as they are perceived to be beneficial and as core resources allow.

## **CURRENT STATUS OF E-GOVERNMENT RESEARCH**

The growing accessibility of the Internet and WWW to citizens, stakeholder groups, and a variety of public and private sector organizations brought about a growing belief that such technology could be used to transform traditional bureaucratic arrangements. For example, some researchers have examined how website characteristics, such as levels of interactivity and organizational transparency, might serve as indications of how open or transparent a public organization is to various stakeholders. By examining the websites of national-level agencies, such research has served to document the rapid adoption of WWW-based technology by national governments and has sought to examine how the use of ICT may lead to greater levels of accountability in regards to governmental activities (La Porte, Demchak, & Friis, 2001). Other researchers have adopted a dual approach to examining the extent to which national governments have adopted e-government. For instance, a research study conducted by the consulting firm Accenture examined the level of e-government services offered by 22 countries and also conducted citizen surveys in 12 countries to assess how citizens viewed e-government. The results indicate that Canada, Singapore, and United States lead in the quality and availability of e-government services (Accenture, 2004).

Other scholars have attempted to explore how ICT may serve to transform broader institutional relationships. For example, some scholars have examined how administrative reform movements, such as the reinventing government movement that was initiated during the Clinton Administration, are based at least partially on the presumption that ICT can be used to alter bureaucratic arrangements and, therefore, increase the efficiency and effectiveness with which public services are produced (Gore, 1993). In her examination of federal agencies during the 1990s, Fountain (2001) suggests that WWW-based technologies, such as agency websites, internal ICT networks, and cross-agency systems, can at least potentially bring about increased levels of efficiency and effectiveness. By examining public organizations as they undergo broader administrative reforms, this research highlights the underlying assumption that successful institutional reforms are dependent on harnessing ICT.

While some researchers examine national governments, other researchers have focused primarily on studying the e-government activities of state or local governments. West (2004) has examined the extent to which state governments have adopted new forms of ICT and the extent to which such technologies have influenced the delivery of public services, democratic responsiveness, and public attitudes. While acknowledging that most state governments have adopted early the early stages of e-government, he believes that many of the purported benefits of e-government have yet to be realized. For example, most state government now have program information available via the WWW and many states allow for online transactions, and yet most state governments still have not been able to adopt more advanced e-government strategies which would allow for heightened levels of political participation.

Examining the adoption and use of e-government activities by local governments leads to similar findings. Moon (2002b) employed survey data collected by the International City Management Association (ICMA) in order to assess the level of adoption of many e-government practices. His evaluation of over 1400 survey responses also indicates that many local governments have adopted at least rudimentary attempts to post information and provide basic online services. However, few local governments have adopted more advanced forms of ICT that foster high levels of interactivity, communication and actual political participation. This study indicates that the amount of resources available to public organizations may be a primary factor in the adoption of more advanced technologies. Other studies of local governments have also indicated a reluctance to adopt more advanced online technologies. Hinnant and

O’Looney’s (2003) investigation of one online innovation, the personalization of online services, also hints that the adoption of more advanced technologies may be slowed by resource limitations, such as a lack of technical expertise and budgetary considerations. Furthermore, many advanced e-government technologies may also pose public organizations with new social challenges. For example, some ICT practices, such as personalization, require tracking the online activities and interests of individual citizens. Managing and using behavioral information may pose privacy issues that some public organizations have heretofore not been forced to address.

## **FUTURE CHALLENGES AND TRENDS**

Overall, research indicates that the adoption of e-government strategies is still in its infancy. While some innovations, such as information dissemination and even service provision through integrated online WWW portals, has been widely accepted by federal, state, and local governments, more needs to be achieved in order to realize the purported benefits of e-government (Gant, Gant, & Johnson, 2002). Government faces many challenges in regards to realizing the potential of e-government activities. One challenge that is often discussed is one of ICT access. While many citizens have now adopted ICT such as the Internet and WWW, some demographics groups may still be without sufficient access to the very communication systems that e-government often relies upon (Thomas & Streib, 2003). Some research also indicates that even when citizens have sufficient access, some demographic groups may not possess the basic technical skills required to truly make use of e-government systems (Mossberger, Tolbert, & Stansbury, 2003). Private sector firms may not view such issues as overly important as long as their message and online commerce sites are available to their target market. However, government must necessarily be concerned with issues of access and use since it, as an institution, is accountable to the greater public. The access issue may eventually resolve itself as ICT is even more widely adopted within society but it does currently pose an important challenge to public organizations.

Other challenges to the adoption and use of ICT include resource limitations. For example, many governments face severe resource constraints that serve as obstacles to employing ICT in a broad based way. Since governments often face fluctuating budgets and sometimes inconsistent leadership, it is often difficult to support technical and administrative reforms that take years

of nurturing and support in order to bring about lasting change. Governments should seek to develop funding, as well as professional resources, that will serve to maintain and advance e-government initiatives well past the initial adoption of such innovations. Similarly, many governments are being forced to deal with technical and administrative issues that arise from the employment of ICT itself. For example, employing ICT to deliver services to the public requires more attention to issues such as information assurance, ICT systems security and overall organizational accountability. If government wishes stakeholders, such as citizens and private sector firms, to be willing participants in e-government activities, it must provide assurances that such information-intensive activities are well planned out and relatively secure from potential abuse. In essence, governments must seek to promote trust on the part of its stakeholders (Welch & Hinnant, 2003).

## **CONCLUSION**

The adoption of new forms of ICT leads to potential benefits for government organizations. As noted, e-government activities are potentially important technical, as well as administrative, reforms. They may eventually bring about greater levels of efficiency and effectiveness in regards to government operations and service production. Furthermore, they may even bring about heightened levels of government accountability and greater levels of participation in political processes. However, it is important to realize that while the Internet and WWW may serve as paths to better government, observers should not ignore prior research regarding the adoption of ICT by complex organizations. While ICT may be an important driver of change, its impact within the greater social structure of organizations or institutions is sometimes difficult to predict. For instance, previous research examining the adoption of new ICT within public organizations indicates that ICT reinforce preexisting social arrangements or shift power towards higher levels of management (Kraemer & King, 1986). Moreover, adoption of new ICT may shift power towards those in the organization who manage the technology itself (Bugler & Bretschneider, 1993; Kraemer & King, 1986; Kraemer, King, Dunkle, & Lane, 1989). Such findings should serve as caution to those who believe that the adoption of ICT as part of broader e-government initiatives yield only expected results. As government further adopts and even relies upon e-government strategies as a core part of its operations, it must develop institutional mechanisms that better anticipate and manage unexpected results.

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## KEY TERMS

**Digital Government:** The development, adoption, or use of ICT by government organizations and actors.

**Electronic Commerce (e-commerce):** Conducting business and communication transactions over electronic computer networks. This may include the selling of goods and services as well as the transfer of funds from custom-

ers. This may also include inter-firm (business-to-business) transactions as well as intra-firm computer-based activities.

**Electronic Democracy (e-democracy):** The use of ICT such as the Internet or WWW to foster democratic processes such as citizen participation.

**Electronic Government (e-government):** The use of ICT such as the Internet and WWW by public organizations such as government agencies to provide information and public services to citizens and other government stakeholders.

**Electronic Politics (e-politics):** The use of ICT such as the Internet and WWW by political actors to inform and facilitate public participation in the political process.

**Internet:** A large system of interconnected computer networks composed of backbone networks, mid-level networks, and local networks. This includes networks owned and managed by public, private, and nonprofit sector organizations.

**World Wide Web (WWW or web):** A hypertext-based client-server system that is one component of the larger Internet. The hypertext-based format of the WWW allows users to navigate through the system by using graphical user interface software known as browsers.

**Electronic Procurement (e-procurement):** The use of ICT such as the Internet and WWW by government agencies to facilitate the purchasing of goods and services.