

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 program-

matic 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 Protec-

tion 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 ability of new ICT to enhance communication and information sharing among public organizations with similar goals is often seen by public agencies as a major reason for adopting such technologies. 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, increased ICT compatibility is sought 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 have increasingly employed Commercial Off-The-Shelf (COTS) products as well. 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 standard operational processes) – is representative of current attempts to develop 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 focused attention towards efforts to integrate commercial ICT into an organization's 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 and 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

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