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A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance

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A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance

Summary

Electronic government (e-government) intersects many legislative issues, including privacy, digital divide (the lack of equal access to computers, whether due to a lack of financial resources or necessary skills), public access to government information, service delivery, and information security. E-government solutions are prominently represented in efforts to improve the management and efficiency of government information technology resources. To help policymakers discern e-government initiatives relative to their role in various issues, this report identifies and defines the principal e-government sectors and stages of development. It also outlines some of the opportunities and challenges associated with e-government.

Some observers define e-government in terms of specific actions: using a government kiosk to receive job information, applying for Social Security benefits through a web site, or creating shared databases for multiple agencies, as examples. Other observers define e-government more generally as automating the delivery of government services. While perceptions vary widely, one organization, The Gartner Group, summarizes e-government as "the continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the Internet, and new media."

E-government initiatives could have implications for federalism. One of the hallmarks of a federal system of governance is the emphasis on vertical divisions of power. In contrast, e-government initiatives utilize information technologies that emphasize a horizontal, or networked, model of communication and interaction. While e-government is designed, in part, to dissolve the barriers separating different agencies, it could also have a similar effect on the boundaries of federal governance.

Although e-government encompasses a wide range of activities and actors, three distinct sectors can be identified. These include government-to-government (G2G), government-to-business (G2B), and government-to-citizen (G2C). Each of these sectors represents a different combination of motivating forces and initiatives. However, some common goals include improving the efficiency, reliability, and quality of services for the respective constituency groups.

Due to a variety of technical, economic, and political reasons, e-government initiatives take time to evolve into their full potential. Consequently, one can divide e-government projects into four stages of evolution: presence, interaction, transaction, and transformation. Each successive stage represents an augmented capability to provide information and services as interactive transactions online.

Finally, proponents and critics of e-government recognize that there are a variety of opportunities and challenges involved with the successful implementation of e-government initiatives. Some of the potential opportunities include new services, increased citizen participation in government, and an enhanced national information infrastructure. Some of the potential challenges include information security and privacy, disparities in computer access, and management and funding requirements.

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A Primer on E-Government: Sectors, Stages, Opportunities, and Challenges of Online Governance

Background

Electronic government (e-government) intersects many legislative issues, including privacy, digital divide (the lack of equal access to computers, whether due to a lack of financial resources or necessary skills), public access to government information, service delivery, and information security. E-government solutions are prominently represented in efforts to improve the management and efficiency of government information technology resources. As such, e-government can be considered a process, or a means to an end, rather than an end in and of itself. E-government is still in the earliest stages of development and promises to evolve with advances in technology and increased acceptance and trust in electronic communications.[1] The dynamic nature of e-government and its broad sectoral applications may sometimes contribute to a lack of a common understanding of its meaning and significance. To help policymakers discern e-government initiatives relative to their applications to various issues, this report identifies and defines the principal e-government sectors and phases of development. This report also outlines some of the major issue opportunities and challenges associated with e-government.

What is E-Government?

E-government means different things to different people. Some observers define e-government in terms of specific actions: using a government kiosk to receive job information, applying for Social Security benefits through a web site, or creating shared databases for multiple agencies, as examples. Other observers define e-government more generally as automating the delivery of government services. While perceptions of e-government vary widely, some common themes can be identified that capture its evolutionary nature.

E-government involves using information technology, and especially the Internet, to improve the delivery of government services to citizens, businesses, and other government agencies. It has the potential to more directly connect the federal government with its citizens in a manner that opens new opportunities while also raising new challenges. E-government could enable citizens to interact and receive

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[1]For a more detailed discussion of the role of trust in the development and dependence upon networked information systems, see Fred B. Schneider (ed.), *Trust in Cyberspace* (Washington, DC: National Academy of Sciences, 1999).

services from the federal government (or state and local governments) 24 hours a day, seven days a week. Some observers of e-government initiatives suggest service delivery could become more convenient, dependable, and less costly. The Gartner Group describe e-government as "the continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the Internet, and new media."[2]

E-government is itself a process still in the early stages of development. Initial forays into e-government initiatives have focused mostly on providing enhanced access to information and basic services. Although the full transformative effects of e-government remain largely unrealized at this time, the rapid growth in interest and resources dedicated to e-government initiatives may contribute to swifter changes.

Implications for Federalism

One area where the implications for implementing e-government initiatives may have a significant effect relates to the concerns of federalism. The Constitution established a federal system of governance granting certain powers to the national government while reserving others to the states and the people. Throughout the history of the country, the nature of American federalism has evolved, reflecting the political, economic, and social changes that have occurred.[3] However, one of the hallmarks of a federal system of governance is the emphasis on vertical divisions of power. In contrast, e-government initiatives utilize information technologies that emphasize a horizontal, or networked, model of communication and interaction. While e-government is designed, in part, to break down the barriers separating different agencies, it could also have a similar effect on the boundaries of federal governance.

In light of the divergent properties of federalism and e-government, the advent of e-government has the potential to effect significantly the power relationship between the national and state governments. An example includes initiatives to create "one-stop-shopping" Web sites to obtain government services and information, such as the FirstGov site. In addition to its original role of providing access to all federal government Web sites, FirstGov has added links to most state Web sites as well.[4] One of the goals of these types of sites is to create an experience that attenuates the agency-centric approach to providing services. Although this usually refers to agencies at the same level of government, it could also include services that are provided through some form of national, state, and/or local cooperation, such as welfare, transportation, or law enforcement activities. However, these same efforts

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[2]Gartner Group, "Key Issues in E-Government Strategy and Management," *Research Notes, Key Issues*, 23 May 2000.

[3]See CRS Report RL30772, *American Federalism, 1776 to 2000: Significant Events*, by Eugene Boyd and Michael K. Fauntroy, for a more comprehensive analysis of the evolution of American federalism.

[4]William Matthews, "FirstGov to Add State Links," *Federal Computer Week*, 21 May 2001, p. 13.

to improve the delivery of government services could also diffuse political responsibility and credit, making it less clear from where the funding and direction are originating.

The Multidimensional Nature of E-Government Issues

Discussed in greater detail below, the advent of e-government raises a number of issues. It is important to stress at this point the multidimensional nature of those issues. On the one hand, e-government provides new opportunities to enhance governance, which can include improved efficiency, new services, increased citizen participation, and an enhanced National Information Infrastructure. On the other hand, e-government also presents new challenges to governance including information security, privacy, disparities in computer access, and management and funding requirements. Together, all of these issues are complicated by their combined intra- and inter-governmental nature. They can crosscut both the various sectors and stages of e-government development. However, they also share a number of recurring themes often associated with previous, less technologically-dependent approaches to improving government such as jurisdictional authority, procedures for the appropriate handling of information, building and maintaining infrastructures, providing services, and citizens' rights. The multidimensional nature of e-government suggests that there are no quick fixes for the concerns raised, but rather that issues will need to be addressed with careful attention to context and precedent.

Sectors of E-Government

Although e-government encompasses a wide range of activities and actors, three distinct sectors can be identified. These include government-to-government (G2G), government-to-business (G2B), and government-to-citizen (G2C). Some observers also identify a fourth sector, government-to-employee (G2E). However, since G2E operations are intra-agency activities, they can be considered a subset of the G2G sector and are not addressed separately in this report. A separate report focusing specifically on G2E issues is forthcoming.

Government-to-Government (G2G)

In many respects, the G2G sector represents the backbone of e-government. Some observers suggest that governments (federal, state, local) must enhance and update their own internal systems and procedures before electronic transactions with citizens and businesses can be successful.[5] G2G e-government involves sharing data and conducting electronic exchanges between governmental actors. This involves

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[5]Robert D. Atkinson and Jacob Ulevich, *Digital Government: The Next Step to Reengineering the Federal Government*, Technology & New Economy Project, Progressive Policy Institute, March 2000.

both intra- and inter-agency exchanges at the federal level, as well as exchanges between the federal, state, and local levels.

Motivating Forces Behind the G2G Sector. There are a number of forces motivating G2G e-government initiatives. One of these involves legislation. There are a variety of laws and regulations that are contributing to the implementation of e-government initiatives.[6] For example, the Paperwork Reduction Act (PRA) reduces the information collection and reporting requirements of the federal government while also promoting the coordination of government-wide information management activities.[7] The Computer Security Act requires federal agencies to develop information security plans, and tasks the National Institute for Standards and Technology (NIST) with the responsibility to develop federal government computer security standards. The Clinger-Cohen Act, among other provisions, established a chief information officer (CIO) in each executive branch agency, decentralized and streamlined information technology procurement procedures, and assigned information technology capital planning and investment responsibilities to the Office of Management and Budget (OMB).[8] The Government Paperwork Elimination Act (GPEA) requires OMB to provide leadership in acquiring and implementing the technology necessary to substitute electronic documents for paper documents.[9] GPEA also tasks OMB, in conjunction with the National Telecommunications and Information Administration (NTIA), to establish procedures for the use and acceptance of electronic signatures[10] in the executive branch of the federal government.

A second force spurring G2G initiatives is the interest in improved efficiency. One of the expected benefits of information technology investment solutions often cited by proponents is cost savings achieved by increasing the speed of transactions, reducing the number of personnel necessary to complete a task, and improving the

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[6]See CRS Report RL30745, *Electronic Government: A Conceptual Overview*, by Harold C. Relyea, for a more comprehensive analysis of the legislation and policy environment shaping e-government initiatives.

[7]See CRS Report RL30590, *Paperwork Reduction Act Reauthorization and Government Information Management Issues*, by Harold C. Relyea, for a more comprehensive analysis of PRA.

[8]See CRS Report RL30661, *Government Information Technology Management: Past and Future Issues (The Clinger-Cohen Act)*, by Jeffrey W. Seifert, for a more comprehensive analysis of the Clinger-Cohen Act.

[9]The creation of multiple formats raises the issue of determining what is considered the "official" version of government material and whether online publication satisfies requirements regarding the printing and archiving of documents.

[10]Electronic signatures (e-signatures) are methods used with an electronically transmitted message that uniquely identifies the sender. Like a written signature, the purpose of an electronic signature is to guarantee that the individual sending the message really is who he or she claims to be. Electronic signatures are especially important for electronic commerce. See CRS Report RS20344, *Electronic Signatures: Technology Developments and Legislative Issues*, by Richard M. Nunno, for a more comprehensive analysis of issues related to electronic signatures.

consistency of outcomes.[11] As attention to efforts to contain the growth of the federal budget has grown, so has interest in using information technology solutions to streamline procedures and trim costs.

Related to this interest in efficiency, a third driving force is the growing attention being paid to improving the management of federal government information technology and public resources. Efforts to identify and apply "best practices" from other areas of the public and private sectors have helped fuel the development of federal e-government initiatives. State and local governments are often perceived as models for e-government initiatives due to their role in delivering services to citizens.[12] State and local governments are also the targets of many G2G efforts due to their relative proximity, geographically and politically, to citizens. A growing reliance on information technology generally, and the need to update and invest in long term information technology projects, such as the overhaul of the Federal Aviation Administration (FAA) and the Internal Revenue Service (IRS) systems, have emphasized the importance of good information technology management practices to help ensure the success of these projects. As part of re-examining information technology management strategies, policymakers have considered many approaches to restructuring government. In this context, e-government is often proposed as a solution.

Examples of G2G Initiatives. One example of a G2G e-government initiative is the Northeast Gang Information System (NEGIS). NEGIS is sponsored by the Department of Justice and serves as a shared resource for street gang information for states in the northeast, including Connecticut, Rhode Island, Vermont, Massachusetts, and New York. It includes information such as gang-related activities, gang intelligence, and a reference library. NEGIS connects the state police departments of the participant-states, which, in turn, transmit the information to the states' other law enforcement agencies.

A second example is the Electronic Contractor Past Performance System maintained by the National Institutes of Health (NIH). Started in December 1996, this online database contains past performance scorecards of government contractors, as rated by contract/project officers. It is designed to help agencies determine the suitability of potential contractors on the basis of criteria such as the quality of product or service, cost control, timeliness of performance, and business practices. Thirteen agencies contribute to the database, including the Environmental Protection Agency (EPA), the Department of Commerce, and the General Services Administration (GSA).

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[11]John Trattner, "E-gov Revolution Transforms Federal Operations," *Government Executive Magazine*, 29 November 2000, [http://www.govexec.com/dailyfed/1100/112900PRUNE.htm].

[12]Timothy Sprehe, "States Show Feds the Way," *Federal Computer Week*, 30 April 2001, p. 48; William Matthews, "States More 'Freewheeling' in Egov.," *Civic.Com*, 9 August 2000, [http://www.civic.com/civic/articles/2000/0807/web-1egov-08-09-00.asp].

Government-to-Business (G2B)

Government-to-Business (G2B) initiatives receive a significant amount of attention, in part because of the high enthusiasm of the business sector and the potential for reducing costs through improved procurement practices and increased competition.[13] The G2B sector includes both the sale of surplus government goods to the public, as well as the procurement of goods and services. Although not all are directly dependent on the use of information technology, several different procurement methods are used in relation to the G2B sector. *Performance-based contracting* is a method in which the payment made to the contractor is based on the actual goals and outcomes of the job. *Share-in-Savings contracts* are those in which the contractor pays for the up-front costs of a project, such as the installation of a new computer system, and receives payment passed on the savings generated by switching from the previous system.[14] *Reverse auctions*, on the other hand, are reliant on the use of information technology and could become a frequently used method for purchasing products that are standardized and easily evaluated for quality, such as off-the-shelf technology components or office supplies. Conducted over the Internet, a reverse auction entails companies openly bidding against each other in real time to win a government contract. The purpose of reverse auctions is to drive prices down to market levels. Due to the emphasis on price, reverse auctions are best-suited in cases where quality and expected performance are clear and easily assessed.

Motivating Forces Behind the G2B Sector. There are two primary forces driving the G2B sector. The first is the business community. In many industries, the use of electronic means to carry out various activities, such as procurement, sales, and hiring is commonplace. For example, the auto industry created an electronic business exchange called Covisint in fall 2000. Covisint provides an online environment for automakers and parts suppliers to buy and sell goods, share information, and collaborate on new products.[15] In addition, the software industry is producing an ever-growing number of products focused on moving routine business activities online. Many companies would like to extend the cost savings realized in their B2B transactions to their business with federal, state, and local governments (B2G).

The second primary force motivating interest in the G2B sector is the growing demand by policymakers for cost cutting and more efficient procurement. Similar to the interest in efficiency that is helping propel G2G initiatives, many G2B initiatives are promoted on their potential to streamline and improve the consistency of personnel-intensive tasks, such as processing license renewals or employee benefit changes. However, there is some disagreement over whether these efforts should help centralize or decentralize procurement by agencies. Until the passage of the Clinger-Cohen Act in 1996, procurement decisions for information technology products and services were generally centralized, with the General Services Administration (GSA) performing a significant role. Among its provisions, the Clinger-Cohen Act

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[13]Alorie Gilbert, "President Bush Backs E-Government, Digital Signatures," *InformationWeek*, 6 April 2001, p. 24.

[14]Greg Langlois, "An Equal Slice of Success," *Federal Computer Week*, 14 May 2001, p. 44.

[15]The Covisint Web site may be found at [http://www.covisint.com/].

decentralized some of the decisions back to the agencies. Some observers suggest that decentralized procurement allows agencies greater control over their own projects, and reduces the amount of time between when a product is ordered and when it is delivered.[16] In contrast, other observers promote centralized procurement on the basis that it will lower costs by aggregating the purchases of similar products by multiple agencies and enhance accountability by limiting the number of people authorized to enter into purchase agreements.[17]

Examples of G2B Initiatives. One example of a G2B initiative is GSA Auctions.[18] GSA Auctions is an online auction Web site in which GSA sells federal surplus property to the highest bidders. Items sold include everything from hand tools and furniture to industrial machinery and vehicles. Perhaps one of the more well-known items was the recent auction of a fifty-year-old Coast Guard cutter, the Tamaroa, which appeared in the movie *Perfect Storm*.

A second example of a G2B initiative is Buyers.gov, a business and auction exchange administered by the GSA Federal Technology Service (FTS). The Buyers.gov site facilitates the purchase of information technology products by federal government agencies through the use of reverse auctions and aggregating demand for commonly purchased products.[19]

A third G2B initiative, also administered by GSA, is FedBizOpps.[20] FedBizOpps is a Web site designed to serve as a central location for agencies to post procurement notices, such as Request-for-Purchase (RFP) notices. The goal of the site is to create a standardized, easy-to-access point of contact for businesses which may want to bid on a government contract instead of having to search through the variety of agency-specific methods of advertising contracting opportunities.[21] A similar site called DoDBusOpps was also established specifically for the Department of Defense.[22]

Government-to-Citizen (G2C)

The third e-government sector is Government-to-Citizen (G2C). G2C initiatives are designed to facilitate citizen interaction with government, which is what some observers perceive to be the primary goal of e-government. These initiatives attempt

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[16]Senator Fred Thompson, Committee on Governmental Affairs, *Government at the Brink: Urgent Federal Government Management Problems Facing the Bush Administration*, June 2001, Vol. 1, p. 37; Dan Caterinicchia, "Tough times for 8(a)s," *Federal Computer Week*, 18 September 2000, [http://www.fcw.com/supplements/Fedlist/2000/fed-8as-09-18-00.asp].

[17]Katy Saldarini, "Feeling the Consequences of Procurement Reform," *Government Executive Magazine*, 18 January 2000, [http://www.govexec.com/dailyfed/0100/011800k1.htm].

[18]The GSA Auctions Web site can be found at [http://www.gsaauctions.gov].

[19]The Buyers.gov Web site can be found at [http://www.buyers.gov].

[20]The FedBizOpps Web site can be found at [http://www.fedbizopps.gov].

[21]Jason Peckenpaugh, "Council Issues Online Procurement Rules," *Government Executive Magazine*, 17 May 2001, [http://www.govexec.com/dailyfed/0501/051701p1.htm].

[22]The DoDBusOpps Web site can be found at [http://www.dodbusopps.com].

to make transactions, such as renewing licenses and certifications, paying taxes, and applying for benefits, less time consuming and easier to carry out. G2C initiatives also often strive to enhance access to public information through the use of dissemination tools, such as web sites and/or kiosks. Another feature of many G2C initiatives is the effort to attenuate the agency-centric, and at times, process-laden nature of some government functions. Some e-government advocates suggest that one of the goals of implementing these initiatives should be to create a "one-stop shopping" site where citizens can carry out a variety of tasks, especially those that involve multiple agencies, without requiring the citizen to initiate contacts with each agency individually.[23] A potential outgrowth of G2C initiatives is that they may facilitate citizen-to-citizen interaction and increase citizen participation in government by creating more opportunities that overcome possible time and geographic barriers, thereby connecting citizens who may not ordinarily come into contact with one another.

Motivating Forces Behind the G2C Sector. Interest in G2C initiatives is driven by a combination of several factors. One is citizen demand, especially by younger citizens and those accustomed to using electronic transactions in other areas of their lives (e.g., banking).[24] Some observers expect the citizen demand for e-government to increase significantly over the next ten years as the youth, who are now growing up with personal computers and the Internet as a routine presence in their lives, become adults.[25] However, studies illustrating the relatively low political activity of young adults suggest this uptick in citizen participation may be delayed several years.[26] Citizen demand may also be driven by increased time pressures. As citizens feel they have increased demands placed on their time, they may look for ways to reduce time spent standing in lines and taking care of administrative tasks. One way to do this is to be able to complete routine governmental transactions, such as renewing a license or applying for a permit online. Similar to G2G and G2B projects, G2C initiatives are also driven by an interest in "better government" through improved efficiency and more reliable outcomes.

Examples of G2C Initiatives. Although many examples of G2C initiatives can be found at the local and state level, there are also examples at the federal level. One of these examples is the establishment of the FirstGov Web site.[27] FirstGov, a public-private partnership, is administered by GSA. Established in September 2000,

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[23]Judi Hasson, "Treasury CIO Promotes Expanded Fed Portal," *Federal Computer Week*, 19 March 2001, p. 14; William Matthews, "Setting a Course for E-Government," *Federal Computer Week*, 11 December 2000, [http://www.fcw.com/fcw/articles/2000/1211/cov-egov-12-11-00.asp].

[24]John P. Mello, Jr., "Building a Better Bureaucracy," *CFO.com*, 1 October 2000, [http://www.cfo.com/article/1,4616,0|1|AD|1012,00.html].

[25]"A Survey of Government and the Internet, Digital Democracy," *The Economist*, 24 June 2000, p. 31.

[26]John M. Strate, Charles J. Parrish, Charles D. Elder, and Coit Ford, "Life Span Civic Development and Voting Participation," *American Political Science Review*, vol. 83, June 1989.

[27]The FirstGov Web site can be found at [http://www.firstgov.gov].

FirstGov is designed to serve as the online portal[28] for 30 million pages of government information, services, and online transactions. According to the Web site, FirstGov has a search engine capable of searching "every word of every U.S. government document in a quarter of a second or less." Its creators also hope that FirstGov will serve as a platform for future efforts to provide "secure seamless electronic government."

A second example is the IRS.[29] In addition to providing all IRS tax forms online for downloading, the IRS Web site also contains a wealth of information to answer a variety of tax-related questions that citizens might normally ask during a call to an IRS telephone help line or a visit to one of its centers. The IRS also allows citizens and businesses to file and pay their taxes online using an option called *e-file*. Depending on one's tax situation, *e-file* can enable a filer to submit information, make payments, and receive refunds electronically.

Stages of E-Government

In addition to identifying e-government initiatives according to their sector, such projects can also be classified according to their level or stage of development. Although different e-government initiatives strive to accomplish different goals, some observers argue that one of the overarching themes of e-government is to fully realize the capabilities of available information technology in an effort to transform government from an agency-centric, limited service operation into an automated, citizen-centric operation capable of delivering government services to citizens, businesses, and other government agencies 24 hours a day, seven days a week. However, for a variety of technical, economic, and political reasons, it will take time for these initiatives to evolve into their full potential. For that reason, some observers use a common schema for classifying the stages of evolution of e-government projects.[30] The schema is based on the degree to which the properties of information technology have been utilized to enable the delivery of services electronically. Using this schema, there are four stages of evolution; presence, interaction, transaction, and transformation. It is important to note that an e-government initiative does not necessarily have to start at the first stage and work its way through all of the stages. Instead, a project can skip levels, either from its inception or as it develops.

Presence

Presence is the first stage of development and is the establishment of a placeholder for delivering information in the future. It represents the simplest and least expensive entrance into e-government, but it also offers the fewest options for citizens. A typical example is a basic Web site that lists cursory information about an

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[28]A portal is a web site that provides a broad array of resources and services such as search engines, forums, and specialized content.

[29]The IRS Web site can be found at [http://www.irs.gov].

[30]Christopher Baum and Andrea Di Maio, *Gartner's Four Phases of E-Government Model*, 21 November 2000.

agency, such as hours of operation, mailing address, and/or phone numbers, but has no interactive capabilities. It is a passive presentation of general information. Some observers refer to these types of sites as 'brochureware,' suggesting they are the electronic equivalent of a paper brochure.

Interaction

The second stage is interaction. Although interactive Web-based initiatives offer enhanced capabilities, efforts in this group are still limited in their ability to streamline and automate government functions. Interactions are relatively simple and generally revolve around information provision. These types of initiatives are designed to help the customer avoid a trip to an office or make a phone call by making commonly requested information and forms available around the clock. These resources may include instructions for obtaining services, downloadable forms to be printed and mailed back to an agency, or perhaps e-mail contact to respond to simple questions.

Transaction

The third stage in the evolution of e-government initiatives is transaction. These initiatives are more complex than simple information provision and embody the types of activities popularly associated with e-government. They enable clients to complete entire tasks electronically at any time of the day or night. These initiatives effectively create self-service operations for tasks such as license renewals, paying taxes and fees, and submitting bids for procurement contracts. Although the level of interactivity is of a higher magnitude than second stage initiatives, the activities still involve a flow of information that is primarily one-way (either to government or to the client, depending on the activity). The electronic responses are generally highly regularized and create predictable outcomes (e.g., approving a license renewal, creating a receipt, acknowledging a bid).

Transformation

The highest order of evolution for e-government initiatives is transformation. Initiatives at this level utilize the full capabilities of the technology to transform how government functions are conceived, organized, and executed. Such initiatives would have the robust customer relationship management capabilities required to handle a full range of questions, problems, and needs. Currently, there are very few examples of this type of initiative, in part due to administrative, technical, and fiscal constraints. One of the distinctions of these initiatives is that they facilitate the seamless flow of information and collaborative decision making between federal, state, local, public, and private partners. In other words, transformative e-government initiatives often seek to remove the organizational barriers that promote agency-centric solutions and, instead, promote customer-centric solutions. Some advocates suggest that, at its most advanced level, e-government could potentially re-organize, combine, and/or eliminate existing agencies and replace them with virtual organizations.[31]

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[31] Ibid.

Issues for Congress

Potential Opportunities of E-Government

On the one hand, proponents of e-government suggest these initiatives will provide a variety of opportunities to improve governance. As discussed above, there are a number of forces driving the different e-government sectors. However, proponents of e-government suggest there are some overarching benefits that will result, either directly or indirectly, from these initiatives. E-government is one means Congress may use to try to achieve objectives related to these issues.

Efficiency. As with many information technology-related projects, one of the anticipated benefits is improved efficiency. In e-government projects, this efficiency can take many forms. Some projects seek to reduce errors and improve consistency of outcomes by automating standardized tasks. A related efficiency goal of many e-government initiatives is to reduce costs and layers of organizational processes by re-engineering and streamlining operating procedures. Similarly, some e-government advocates suggest that reducing the amount of time spent on repetitive tasks will give those federal employees an opportunity to develop new skills and advance their careers.[32]

New and Improved Services. Another opportunity promoted by e-government supporters is the potential to improve the quality, range, and accessibility of services. Some observers suggest that, in addition to enhanced efficiency, the quality of services may be improved through quicker transactions, improved accountability, and better processes. The evolution of e-government also creates the potential for new services. Along with the possibility of combining existing services, e-government initiatives could contribute to a qualitative change in how government conducts business and how citizens interact with government and each other.

Increase Citizen Participation. A third benefit anticipated by some e-government advocates is increased citizen participation in government. One way this could occur is by connecting people who live in remote areas of the country so that they can send and receive information more easily. A second way suggested by some observers is through increased participation in government by younger adults. Some advocates believe that the generation of citizens about to come of political age, who have grown up with the Internet and digital communications technologies in their everyday lives, will be more likely to become participant citizens if the means to do so are similar to the ones they use for personal and professional activities. By extension, e-government initiatives could also enhance citizen-to-citizen (C2C) interaction by providing opportunities for people with similar interests, opinions, and concerns, who may be geographically separated, to interact and share information.

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[32]Jeff Breen, "At the Dawn of E-Government: The Citizen as Customer," *Government Finance Review*, 1 October 2000, p. 15; Daintry Duffy, "Q&A: Balancing the Role of E-Government," *CNN*, 13 November 2000, [http://www.cnn.com/2000/TECH/computing/11/13/qna.egov.idg/].

Improved National Information Infrastructure. A fourth possible benefit of the drive to implement e-government initiatives is the improvement of the national information infrastructure (NII). During the years leading up to the Y2K rollover, there was growing concern over the protection of NII. As part of the efforts to address the Y2K problem, former President Clinton released Presidential Decision Directive No. 63. "The Directive sets up groups within the federal government to develop and implement plans that would protect government-operated infrastructures and calls for a dialogue between government and the private sector to develop a National Infrastructure Assurance Plan that would protect the nation's critical infrastructures by the year 2003."[33] However, following the successful handling of the Year 2000 (Y2K) problem, there has not been an event approaching the same level of perceived urgency to focus interest in NII issues. The effort to make many government services available online could renew interest in the NII and lead to its further development to accommodate the resource needs of these initiatives. By extension, additional investment in NII could lead to increased attention to information security issues and the development of new technologies.

Potential Challenges to E-Government

On the other hand, despite the potential opportunities for the implementation of e-government initiatives, there are a number of challenges that could prevent the realization of these anticipated benefits. Some of the challenges, such as disparities in computer access (digital divide - the lack of equal access to computers, whether due to a lack of financial resources or necessary skills), are pre-existing conditions that are connected to larger issues. Others, such as funding rules and concerns about federalism, are problems that have emerged out of efforts to integrate information technology into government generally.

Computer Security. Perhaps one of the most significant challenges for implementing e-government initiatives is computer security. In a series of evaluations published since July 1999, the General Accounting Office (GAO) has repeatedly reported that the largest federal agencies "were not adequately protecting critical federal operations and assets from computer-based attacks."[34] Specifically, GAO has identified six areas of weakness: security program management, access controls, software development and change controls, segregation of duties, operating systems controls, and service continuity.[35] For e-government activities, service continuity is critical not only for the availability and delivery of services, but also to build citizen confidence and trust. However, the risks of fraud and misuse of sensitive data are concerns as well.

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[33]See CRS Report RL30153, *Critical Infrastructures: Background and Early Implementation of PDD-63*, by John D. Moteff.

[34]General Accounting Office, *Information Security: Weaknesses at 22 Agencies*, GAO/AIMD-00-32R, 10 November 1999, p. 1.

[35]General Accounting Office, *Computer Security: Weaknesses Continue to Place Critical Federal Operations and Assets at Risk*, GAO-01-600T, 5 April 2001, p. 4.

Privacy. Related to computer security, privacy also presents a challenge to the implementation and acceptance of e-government initiatives. Concerns about the use of "cookies,"[36] sharing information between agencies (computer matching)[37], and the disclosure or mishandling of private information are frequent subjects of debate. As GAO reported in a September 2000 report regarding online privacy protections at federal web sites, nearly one-third (23 of 70) of the agencies had shared personal information with other agencies, and, in some cases, with private sector entities.[38] In June 2000, it was reported that the National Drug Control Policy Office was using cookies to track the Internet movements of visitors to its site.[39] These privacy breaches could have a negative impact on citizens' trust in government Web sites and Web-based services. Addressing the issue of privacy in the context of e-government may require both technical and policy responses.

Disparities in Computer Access. Another challenge for e-government is disparities in computer access. This challenge includes two policy issues: the often described "digital divide" and accessibility for people with disabilities. In the case of the digital divide, not all citizens currently have equal access to computers, whether due to a lack of financial resources or necessary skills. While the placement of Internet-enabled computers in schools and public libraries is helping address this issue, these efforts are still progressing.[40] Some observers point out that much of what governments do involves interactions with people least likely to have access: the poor, the elderly, language-limited persons, and the less-well-educated.[41] Similarly, advocates for the disabled observe that computers can present new obstacles for citizens such as the blind or physically impaired, who may require costly hardware or software for their computers, such as screen readers or oral controls, to be able to

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[36]Cookies are small text files placed on a user's computer by a web site so that it can track the user's movement through a Web site. Originally designed to allow user-side customization of Web information, the expanded use of cookies has raised concerns about the privacy of a user's Web browsing habits. For a more comprehensive analysis of the privacy issues surrounding the use of cookies, see CRS Report RL30784, *Internet Privacy: An Analysis of Technology and Policy Issues*, by Marcia S. Smith.

[37]"Agencies often share information to establish or verify an individual's eligibility for federal benefits programs or to collect payments or delinquent debts. This enables agencies to reduce errors and prevent fraud." As more data is stored and processed electronically, it becomes easier for citizen information to be transmitted and shared. Diane Frank, "OMB Adds Guidance on Privacy," *Federal Computer Week*, 8 January 2001, [http://www.fcw.com/fcw/articles/2001/0108/web-omb-01-08-01.asp]. See CRS Report RL30824, *The Privacy Act: Emerging Issues and Related Legislation*, by Harold C. Relyea, for a more comprehensive analysis of computer matching issues.

[38]General Accounting Office, *Internet Privacy: Agencies' Efforts to Implement OMB's Privacy Policy*, GAO/GGD-00-191, September 2000.

[39]John F Harris and John Schwartz, "Anti-Drug Web Site Tracks Visitors," *Washington Post*, 22 June 2000, p. A23.

[40]U.S. Department of Commerce, *Falling Through the Net: Toward Digital Inclusion*, October 2000, [http://www.esa.doc.gov/fttn00.pdf]

[41]A Survey of Government and the Internet"The Next Revolution," *The Economist*, 24 June 2000, p. 2.

access online information and services. This also requires that these resources be designed in a manner that makes them accessible using these tools. On June 21, 2001, Section 508 of the Rehabilitation Act Amendments of 1998 went into effect. Section 508 requires all electronic and information technology deployed by federal agencies to be accessible to both federal employees and members of the public with disabilities. The law applies to Web sites and equipment. Changes to the Federal Acquisition Regulations (FAR) for implementing Section 508 went into effect on June 25, 2001.[42]

Government Information Technology Management and Funding. A multilayered challenge for the development of e-government is government information technology management and funding. This includes issues such as government information technology worker recruitment, retention, and compensation; the establishment of a federal CIO; and cooperation between local, state, and federal governments. While e-government provides the opportunity for federal employees to develop new skills, it also presents the dilemma of hiring and retaining skilled information technology workers in a relatively high-demand field. Below-market salaries[43] and the inability to offer some types of benefits hinders the government's ability to attract and retain skilled workers, forcing it to either outsource certain projects or delay implementation.[44]

Likewise, the growing debate over the establishment of a federal CIO raises questions about how to manage and develop information technology and e-government projects. More than just an organizational issue, the outcome of the federal CIO issue has implications for the level of support, funding, and interagency cooperation that will take place.[45]

Another issue related to technology management is federal funding of state and local e-government projects. Some observers claim that the terms attached to federal grants sometimes require predetermined solutions or restrict the use of funds across two or more programs, hindering efforts to create integrated state-wide systems. However, efforts to lift restrictions on commingling federal and state funds could raise concerns regarding federalism, especially or projects that span across several agencies

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[42]For more information about Section 508, see the Federal IT Accessibility Initiative Web site at: [http://www.section508.gov/]. Ben White, "Federal IT for the Disabled Gets Boost," *Washington Post*, 20 June 2001, p. A25; Tanya N. Ballard, "Final Rules Governing IT Accessibility Issued," *Government Executive*, 26 April 2001, [http://www.govexec.com/dailyfed/0401/042601t3.htm].

[43]To help address this issue the Office of Personnel and Management (OPM) created special salary rates, ranging from seven percent to 33 percent, for most government information technology workers in the G5 through G12 pay grades. Colleen O'Hara and Paula Shaki Trimble, "Agencies Fill IT Pay Gaps," *Federal Computer Week*, 5 February 2001, p. 26.

[44]CRS Report RL30661, *Government Information Technology Management: Past and Future Issues (The Clinger-Cohen Act)*, by Jeffrey W. Seifert; Greg Langlois and Paula Shaki Trimble, "Projecting a 'Hip' Image," *Federal Computer Week*, 16 April 2001, p. 24.

[45]See CRS Report RL30914, *Federal Chief Information Officer (CIO): Opportunities and Challenges*, by Jeffrey W. Seifert for a more comprehensive analysis of this issue.

and budgets. This issue may become more critical if there is an increase in the use of information technology grants by the federal government.[46]

Related Legislation

S. 803, Lieberman, E-Government Act of 2001, 5/1/2001 (Governmental Affairs)

H.R. 2458, Turner, E-Government Act of 2001, 7/11/2001 (Government Reform)

[46]William Welsh, "Governors Look to Ease Limits on Fed IT Funds," *Washington Technology*, 15 February 2001, p. 1.