Digital Government Innovation

Note: This bulletin is the first in a series of bulletins that will examine in-depth the best practices and points-of-failure associated with moving services online. The new bulletin series will cover topics associated with the administrative, technological, and policy issues associated with government's use of information technology to improve service delivery activities. Subsequent issues will delve deeper into many of these concepts and provide an opportunity to improve understanding of the many facets of information technology in government agencies.

THE MOVE TOWARD ONLINE GOVERNMENT SERVICES

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To say that today's public agencies are looking to Internet technology to support a myriad of service delivery needs has become somewhat of a cliché. Substantiating the rising interest in electronic government issues, recent research shows that the federal government spends roughly $42 billion annually on their information technology (IT) initiatives. State and local governments surpass federal spending allocating $78 billion annually to their IT activities (Government Technology, 2002). The discussion below provides an introduction into the concept of e-government (e-gov). It elaborates on how various governments are employing the Internet, and it touches on some of the benefits and challenges of providing government service online.

Traditionally, government agencies employed three "channels" to provide the public's business: Face-to-face meetings, telephone conversations, and postal mail services.   Recent advances in IT have given rise to a fourth channel for service delivery—the Internet. Earlier definitions of e-gov tended to conjure up thoughts of home pages that distributed information about an agency and its services. Contemporary definitions of e-gov tend to be broader and encompass virtually any form of electronic transaction. E- gov refers to government's use of technology, particularly Web-based Internet applications, to enhance the access to and delivery of, government services to citizens, business partners, employees, and other government entities.

Service Delivery Channels

Face-to-face
Telephone
Postal
Internet (online)

Types of Interaction

Government to Government
Government to Business
Government to Citizen
Government to Employee

Levels of Activity

Information Dissemination
Communications
Front-office Transactions
Back-office Transactions

E-gov activities focus on four types of interactions: "Government to Citizen" (G2C), "Government to Business" (G2B), and "Government to Government" (G2G), "Government to Employee" (G2E). Within each of these interaction domains, four levels of activity take place.

The simplest type of activity is to provide information over the Internet. Under this scenario, public agencies employ the Internet to publish information on a variety of topics such as public hearing schedules, regulatory notifications, or grant solicitations.

The second type of activity allows two-way communications between the agency and the citizen, a business, or another government agency. These Web pages allow users to engage in dialogue with agencies—users can post queries, comments, or requests for information regardless of time of day or day of week.

Gaining in complexity, the third form of activity that takes place over the Internet involves conducting simple "front-office" transactions. These types of transactions allow forms to be completed and submitted online. These front-office transactions allow customers to access services 24 hours a day, seven days a week. Some of the more typical types of simple transactions that might be provided online can be found in figure 1. The important distinction here is that, in front-office transactions, paper documents of the forms are generated and the forms are then processed according to the traditional work-flow operations.

The final form of activity that takes place over the Web, *transparency,* involves complex or "back-office" transactions. Back-office transactions allow customers to move seamlessly and smoothly from one agency's services to another, never realizing that they have crossed jurisdictional or organizational boundaries.   Duplicate data entry is not required, and the enterprise databases are directly populated without the need to incorporate manual procedures. This fourth form provides the greatest degree of effectiveness and efficiency gains. But it is also the hardest to achieve.

Benefits of Online Services

For the most part, public organizations are turning to online service delivery solutions to improve access and reduce costs. Preliminary studies suggest that substantial savings may accrue by moving services online. Private sector studies estimate that use of the online channel can result in a 50 to 80 percent cost savings over face-to-face, telephone, and postal-based efforts. According to proponents, Web-based services can make interactions with public agencies smoother, easier, and more efficient than the first three channels. Web-based applications provide the opportunity to allow government services to be organized in ways that fit the needs of citizens rather than the requirements of the bureaucracy.

Moving services online can eliminate many of the problems associated with distance and time. Specifically, as governments interact with citizens, businesses, and other public agencies, online services may stimulate five overarching benefits. Governments that employ the fourth channel (online services) in their operations may witness benefits in responsiveness, visibility, efficiency, performance, and integration.

Responsiveness. Online services may allow citizens to benefit from greater levels of government

responsiveness. By way of online services, governments can provide citizens with round-the-clock services in the comfort of their own homes. Citizens can, in effect, conduct business with the government irrespective of their location, the time of day, or the day of the week. The fourth channel allows citizens to conduct business with the agency at their convenience rather than during those hours that serve bureaucratic operations. The ability to leverage technological advances to improve responsiveness is critical to maintaining effective and productive governance practices.

Visibility. Online services allow public agencies to improve the visibility of the services they offer, too. In effect, while online services promote agency responsiveness to citizens, they also allow agencies to reach out to citizens like never before. In essence, via online services, public agencies can expand their reach for distributing, collecting, and tailoring information on program initiatives. For example, the fourth channel provides government agencies with easy reach to citizens for disseminating surveys to assess program outcomes. Public agencies can conduct surveys or send mass mailings without assuming the costs and burdens associated with collating, printing, and postage.

Efficiency- Cost and Time Savings. Purportedly, online services offer substantial benefits in efficiency through promoting cost and time savings. For example, one government claimed to reduce the costs associated with processing paper checks from $0.43 to $0.02 by moving payments online. Public agencies can also reap the benefits that accrue from purchasing products via the highly competitive online market place. Online markets allow suppliers to reduce costs and thus allow customers, such as government organizations, to benefit from more competitive pricing structures. Moreover, online procurement allows governments to benefit from just-in-time inventory approaches. Just-in-time inventorying reduces warehousing costs by eliminating the need to store and stock large volumes of inventory. It allows public agencies access to real-time inventory information, faster fulfillment of orders, and lower overall cost due to the elimination of manually-based paperwork operations.

But time and cost savings are not isolated to the public agency. Private and nonprofit firms that must conduct business with government also recognize substantial time and cost savings when government employs the fourth channel. For example, by moving traffic accident reports online, insurance agencies save the costs associated with transporting and transcribing paper-based reports. Time and overhead costs are reduced by eliminating the need to re-enter data.

Furthermore, substantial savings are often realized by accessing, submitting, and reviewing bid opportunities online. Online services often reduce the number of intermediaries or "hand-offs" that take place in a work process, thereby allowing the agency to achieve streamlining benefits. Parties on both sides of the transaction benefit when work processes are streamlined.

Performance gains. Proponents argue that online services can provide substantial performance gains. Efficiency gains such as reducing intermediaries, eliminating steps in a process, and eradicating duplicative work allows agencies to re-direct resources elsewhere. For example, efficiency gains that eliminate the need to re-key data not only save time, but they also provide agencies with the ability to gain greater and more timely decision-making advantages from their data. Efficiency gains allow public agencies to improve the quality of service delivery by allowing them to redirect limited resources toward other more demanding and needy areas.

Substantial performance and productivity benefits also accrue through online distribution of reports and interpersonal communications. Employees can boost performance when they are de-coupled from the dependencies associated with having to meet face-to-face or by way of the telephone.

Integration. Early speculations suggest that online services might allow the public to benefit from the gains of "virtual integration." It has long been espoused that substantial benefits might accrue if government agencies could more tightly integrate and coordinate their efforts. But tighter integration required the agencies to agree on developing standards for work procedures and data collection efforts. In many instances, agencies argued that collective standards compromised the quality of individual agency services. Compromises for the good of the collective body were not easily achieved and often resulted in political battles, delay, and stalemates. Interestingly, current Web-based technologies may allow agencies to integrate at a "virtual" level—the agencies continue to operate independently but, to the citizen online, distinctions among the agencies appear transparent. Hence, while disconnected in reality, citizens can benefit from a more coordinated agency approach. Online government solutions may be effective levers to overriding cultural and organizational barriers to change making one-stop access a reality.

By and large, online services eliminate some of the inefficiencies that occur in delivering services by way of the first three channels (face-to-face dialogue, telephone, and postal mail). While much can be gained from migrating services online, in the

process of doing so, agencies can also encounter significant challenges.

Challenges to Online Services

Despite the noted benefits, the implementation and maintenance of online service delivery efforts often requires agencies to overcome formidable challenges. The deployment of online services requires an extraordinarily complex combination of technical, organizational, economic, human, and political factors. As noted by McClure (2000) "Successful e-government initiatives must deal with some of the same basic challenges that have plagued information systems for decades—such as inadequate attention to business and technical architecture, adherence to standards, and security."

Unfortunately, studies tend to agree that the benefits of information technology are neither automatic nor guaranteed. Despite substantial resource investments, technological innovations, for many organizations, do not come easily. While the benefits of technology are often touted, more rigorous evaluations suggest that technology projects typically experience high failure rates (Cats-Baril and Thompson, 1996; Keil, 1995; Davis et al, 1992). Investments in online services may yield high returns, but they may also involve assuming high levels of risk. In another study, Cats-Baril and Thompson (1996) claim that 20 percent of all the projects studied were abandoned before completion—and 80 percent of the ones that were completed finished behind schedule, over budget, and with lower functionality than originally anticipated (p.563).

While the past two decades have witnessed the proliferation of computer technology throughout government, public managers are realizing that technology benefits are much more difficult to achieve than is often professed. Organizational leaders are finding that information technology efforts are too often plagued by unusually high project failure rates.

Some of the challenges that dominate discussions pertaining to digital government include better methods of IT management, models for electronic public service transactions and delivery systems, and avenues for citizen participation in democratic processes. Other topics such as secure and controlled access to timely, accurate, and authoritative public records are central to any Web-based initiative. Data quality, data sharing, and privacy and security threats all serve to stymie digital government benefits. In sum, public organizations must overcome a number of hurdles to move service delivery online.

Channel Conflict and Horizontal Coordination. Because the incorporation of a fourth channel will disrupt and reduce services delivered by the first three

channels, organizations must undergo the conflict and turmoil that accompanies change. Online services will eliminate the use of some service channels and force others to converge.

Online services may, in fact, provide a medium for witnessing the efficiency benefits of consolidating many government services. This may be especially true for local governments. The provision of many local government services derived from the need to provide easy access to citizens who were unable to travel long distances to obtain services. If services can be provided online, the incentive to have multiple local governments providing complementary services because of previous access problems may not be cost justified.

Moreover, while movement away from the first three channels may streamline efforts by reducing intermediaries (the number of hand-offs that occur), different sets of intermediaries are likely to develop from the online initiative. While the new set of intermediaries may not be as inefficient as the old set (i.e., time lags differ between postal and electronic mail, but they are nonetheless present in both scenarios; an e-mail server requires support and may exhibit hidden costs).

Complicating matters further, online government services usually incorporate multiple functional and divisional units with their own particular set of requirements. Whereas a human resource system would be designed according to the requirements of a single vertical agency, online solutions are horizontal in nature. Thus, the fourth channel can encounter the difficulties and costs associated with coordinating efforts across agencies.

Cost justification and funding. Understanding the true margin of the costs and benefits that will be achieved from online services can be extremely difficult to understand in advance. There can be many hidden costs and benefits that are not known until deployment. In many ways, funding an IT project of any kind often requires a leap of faith. Furthermore, to justify the system, one must accept some intangible benefits that are difficult to quantify.

Legal and ethical liabilities. The liabilities that might be associated with privacy, security, and ownership are, as yet, not well developed or understood. The water has not been tested on the extent to which a government agency may or may not be held liable if infractions occur. Given that liability issues remain unfettered, online service delivery initiatives may be too threatening for risk-averse governments.

Equal Representation and Accountability Issues. Very little is understood regarding the effects that online governance will have on issues of representation and accountability. Some speculate that online governance might create unique advantages for

certain segments of the population. Concerns about the effects of a digital divide in which low-income groups lack the technology and skills to gain access to online services is troubling for a democratic society. Others speculate that the divide will minimize over time as it has with other technological innovations such as the telephone, the automobile, and television. Nonetheless, few can speculate with any certainty the exact ramifications that online services will have on current government power, representation, or accountability issues.

Technical difficulties. Technical challenges related to bandwidth, integration with operational databases, and lack of system security standards can create formidable barriers to online service-delivery initiatives. While many technological advances have occurred over the last half of the 20th century, a lack of standards for data, communication protocols, and interoperability issues continues to pose problems. Furthermore, bandwidth limitations continue to plague design and development efforts.

As mentioned, because online services tend to occur within a horizontal organizational structure, they typically involve capturing a wider, broader range of requirements. To meet this wider range of requirements, an e-government initiative usually relies on a mixture of technologies that must be successfully integrated in the background. The technology design will be dependent on the types of services the agency chooses to deliver online.

While most public officials appreciate the benefits that e-government solutions can offer, they question their agency's ability to overcome the hurdles associated with adoption and implementation. A recent study of State CIO's conducted by NASIRE identified that, while funding is always difficult, cultural, organizational, and leadership issues are some of the most significant barriers to adoption. Specifically, the survey revealed that the greatest barriers center on:

- Providing a culture of teamwork, innovation, and change
- Educating executives and managers
- Obtaining needed skills and expertise, and
- Reorganizing diverse and complex operational processes.

As discussed, migrating services online can lead to advances in responsiveness, visibility, efficiency, performance, and integration. Yet, the challenges associated with issues such as channel conflict, funding, liability, representation, and technology can stymie efforts. The ability to overcome these challenges has a direct impact on whether citizens will recognize the responsiveness, visibility, efficiency, performance, and integration benefits the fourth channel might provide. As identified earlier, this bulletin is the first in a series of issues that will explore the concept of e-government in detail. Future issues will focus on the three underlying elements that support an e-government activity: administration (i.e., funding, return-on-investment, organizational change, capacity building), policy (i.e., security, privacy, data, operations) and technology (i.e., software, hardware, and communications) concepts.