
The Virtual State: Transforming American Government?

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Over the course of the twentieth century, American government took on its present bureaucratic form through a series of negotiations and political processes. It seems logical to assume—and recent evidence suggests—that this structure of government will change as policy makers and public managers use the Internet and other new information technologies to reshape programs, services, agencies, and policy networks. This article lays out some of the central questions about digital government—or as I call it, the virtual state.¹ By that I mean a government in which decision makers increasingly use information technology (IT) in ways that blur the boundaries among agencies, levels of government, and the private and nonprofit sectors. What are its central features? What efficiencies can we expect from digital government? What challenges should change agents be aware of? Finally, what are some of the larger questions of governance to keep in mind as innovators build the virtual state?

American government appears to be in the early phase of significant transformation as public managers begin to use the Internet and related information technologies in ways that affect coordination, control, and communication. Many of these developments hold the potential for substantial efficiency in producing and delivering information and services. However, since new and unanticipated innovation and interaction is likely to emerge, it is difficult to predict the effects of these technologies on the deeper organizational and institutional restructuring of government.

A useful way to think about digital government operations and their effects is to distinguish among three sets of government relationships. A government-to-citizen (G2C) contact encompasses information and service flows between the government and its citizens. A government-to-business (G2B) transaction includes procurement of goods and services by government from the private sector as well as a variety of other transactions between business and government. Finally, a government-to-government (G2G) relationship characterizes the networked nature of government, including interagency and intergovernmental linkage and partnership. In all cases, the Internet and the World Wide Web make it possible to move information flow and millions of transactions

from paper to a shared digital environment. To better understand this new world, it is worth noting some of the most innovative examples of the virtual state in each category. Together they suggest the breadth and depth of the changes afoot in government.

How Are Innovative Governments Using the Internet?

Innovation often begins at the state level and diffuses to federal and local government. A survey of state government Websites conducted in 2000 to identify the types of service migrating to the Web indicated that the development of electronic government is just beginning. State government agencies are adding basic information to their Websites. But the security and authentication measures required to ensure that Web-based payments become feasible and sensitive documents (such as social security benefit information and tax files) can be transferred safely over the Internet are still being developed.

The results of the survey indicate that provision of electronic government services varies widely from state to state. The median number of services provided over the Web by state government is only 4; the average is about 4.5. Only a few states offer a significantly greater number of services. Several features are common to a number of states. Although the number of services a state offers on the Web is not the only measure of the growth of digital government, it indicates strong disparity among state governments.

The most frequently occurring service, available on thirty-two state government Websites, allows a citizen to find and apply for a state government job online. The second most popular service, personal income tax "e-filing," is available in twenty-four states. State governments have been able to implement electronic filing of taxes because the Internal Revenue Service supported development of private sector solutions that states can purchase and implement. Seventeen state governments permit online renewal of motor vehicle registration, which is probably the fastest growing online service. Fifteen state government Websites allow people to order a fish and game license or permit online, although most states mail the license or permit through the postal service. Fourteen state governments have a registry of sex offenders that can be searched by the public. Thirteen state governments allow the public to order vital records, such as birth, death, and marriage certificates, online. No other online government service is available from more than ten states.

But the virtual state is much more than provision of G2C services on a government Website. Web portals, which organize and integrate government services and information (and which often link to private and nonprofit sources as well), represent vigorous use of the Web to build digital government. Access Washington, perhaps the leading state government Web portal, is part of a well-integrated strategic plan to build digital government across the entire state. Washington State's Digital Government Plan describes in detail the plans for electronic government during the next five to ten years. Strong,

focused leadership within the executive branch is committed to increasing integration across state and local governments, agencies, and programs. Guidelines for coherent development of digital applications as well as incentives to promote successful implementation are being disseminated. The state is also unusual in that it has developed standards for uniform Web design and protocols to guide related business process redesign in state agencies.

At present there is no dominant model of state government Web design. Washington State's top-down, comprehensive approach differs markedly from that of most other state governments, where innovation proceeds incrementally, agency by agency, at the initiative of public entrepreneurs and innovators. The state of Georgia and a few others provide a higher number of online services than Washington. Georgia's state government Web strategy is based on a decentralized approach to digital government. Other states lead in innovative design and customization of their state government Websites. For example, North Carolina and Virginia have moved beyond a simple state portal model to create powerful interfaces to help their citizens find information and to interact with these governments.

At the municipal level, Indianapolis presents the most impressive example of electronic government. Its Web portal evinces an almost seamless integration of agency and department functions. A strong proponent of digital government, former Mayor Stephen Goldsmith wondered publicly why any citizen in the future would need to go to City Hall to transact business with local government.

At the other end, federal efforts span an impressive range of activity as well. Agency Websites have proliferated. More important, such interagency Web portals as Access America for Students, Access America for Seniors, and the U.S. Business Advisor organize data according to the interests of members of the public rather than by agency. As an adjunct to moving government information and transactions online, some agencies promote civic discourse and other public discussion on the Web.

All this innovation has important implications for cost saving—and for participation in public debate. For example, the Postal Rate Commission developed a document management system, called Operating Online, that scans information into digital form. The commission Website makes these digital files available to the public, which means that anyone with Web access can read all the documentation related to hearings. Most agencies with a regulatory mandate have developed similar online document management systems.

Like other regulatory bodies, the Postal Rate Commission is required by law to conduct hearings on all rule-making cases, such as proposals for a postal rate increase or post office closing. Conducted as a legal proceeding, rule making takes place through an extended process of discovery, cross-examination, hearings, briefs, and ultimately a recommendation to (in this instance) the Postal Board of Governors. A proposed rate increase typically requires ten months of proceedings during which citizen and business responses, or pleadings, must be

filed and made available to the public. The accumulated documents may run into tens of thousands of pages. Reproduced perhaps 150 times for dissemination to interested parties, the total could amount to millions of printed pages. Clearly, the ability to place information on a Website for immediate access by the public changes the internal operation of an agency and its costs, not to mention the effect it has on public access and ability to comment during the rule-making process.

Clerical staff manage the voluminous file, called a docket, containing all information related to a proposed rule—public comment, petitions, extensions, and adjudications—during the process. In 1993, the federal Department of Transportation, whose rule-making responsibilities range from air bag regulations to hazardous materials transport, managed nine docket rooms. Researching a docket was labor-intensive and costly. There was no capacity to track materials, some of which might be lost during the complex proceedings. The department moved its docket management process to the Web, making public access considerably easier. In 1999, during the rule-making process initiated when the Maritime Administration was deciding whether to reregister under a foreign flag eight ships designed to transport liquefied natural gas, the Website received more than twelve thousand hits from the firms petitioning for the change and the crew members whose jobs might be lost or modified.

Although the types of G2C innovation detailed here are strategically important, governments have been slow thus far to market new Web-based services to the public. On the one hand, they fear alienating voters who are without access to the Internet. On the other hand, such services might create a level of demand that new, relatively untested online operations may not be ready to meet. The results of a survey of state information resource executives indicate that a number of state governments have begun to take measures to motivate constituents to use new digital government features.² This development should proceed in tandem with maintenance of traditional service delivery methods and with an eye to meeting uncertain demand characteristics.

Regardless of complex management challenges, however, cost savings are potentially enormous. A government that offers electronic services online reaps efficiencies by generating less paperwork, decreasing the cost of processing routine transactions and lowering the error rate (whose correction requires additional work). Government employees may handle fewer inquiries for routine information. But a poorly designed Website and information in language that is difficult to understand almost certainly result in more telephone calls to the public agency. Citizens and business firms should find that the cost of compliance is decreased, including costs associated with information search, travel, waiting in line, repetitive entry of information, and errors.

G2B innovation signals new opportunity for efficiency gains in procurement and other business-government relations. The federal government spends approximately \$524 billion a year, or about 6.04 percent of GDP (in 1999 dollars), on procurement operations.³ Between 1995 and 1999, these procurement expendi-

tures totaled \$2.621 trillion. Web-based procurement operations have the potential to generate vast savings over the cost of traditional manual operations. Such operations may also increase the efficiency of the procurement process itself as new methods and business processes are developed to connect buyer and seller. Finally, a well-designed online process would increase the transparency of government procurement and markets, thereby increasing the effectiveness of regulation and enforcement.

The state of Massachusetts is actively pursuing a regional procurement consortium, called EMail, a joint program of the state's Information Technology Division, the Office of the State Comptroller, and the Operational Services Division. The consortium will include the 154 departments of the government of the Commonwealth as well as many statewide commodity contracts. Moreover, EMail states on its Website that the consortium will be open to participation from "all eligible public entities including cities and towns, public and quasi-public authorities, UFR-qualified [Uniform Financial Standards and Independent Auditor's Report] human service providers, state institutions of higher education, and other states."⁴

In an evaluative study, the designers of the online procurement system estimated the operational costs for one procurement operation. The paper-based procurement operation took 530 minutes to complete and cost \$221. Using electronic data interchange (EDI), a precursor to use of the Internet and Web, required 240 minutes and cost \$100 to complete the same procurement transaction. Web-based procurement as it is designed in EMail required only 49 minutes and cost \$21. Consortium development of state government digital procurement makes sense because the start-up costs involved in building such a complex system are high enough to dissuade many state legislatures from appropriating funds. Pooling resources for such a venture may not only speed implementation but also contribute to economies of scale in purchasing and the opportunity for related network activity.

G2G efforts encompass several types of relationship among government agencies, ranging from data sharing to interagency partnership and networks that link internal operations across jurisdictions. A well-functioning interagency Web portal requires back-end integration and significant cooperation (or social capital) within a network of agencies and programs.⁵ G2G developments are currently constrained by institutional arrangements such as oversight and budget processes that tend to favor single-agency activity. In addition, the administrative independence of federal, state, and local governments means that an executive is attuned to the political constituents in that operating environment. Equally important, legal restrictions prohibit information sharing in some key organizations, for example, the Internal Revenue Service and the Social Security Administration.

It is difficult to forecast the economic impact of G2G activity. Clearly, partnership and shared databases could help the public and government avoid duplication of information gathering, updating, and storage; reduce mailing

and other costs of distributing information on paper; and save time and resources in hundreds of ways by enhancing efficiency of operation and service delivery. In the current political environment, which still favors shrinking the size of government by reducing the number of government employees, it is highly likely that G2G initiatives will be used for further downsizing.

Yet in spite of obstacles and the traditional difficulty of interagency coordination, a surprising and growing number of partnerships suggests readiness and ability on the part of government executives to explore the benefits of G2G activity. Interagency partnership and networks can afford cost savings. More important, however, they offer the potential for government to solve otherwise intractable policy problems that fall inherently between agency boundaries.⁶

An example of an interagency information sharing effort with strong leverage, the Information Network for Public Health Officials (which is housed at the Centers for Disease Control and Protection, U.S. Public Health Service), connects federal, state, and community-level public health practitioners. The information network gives public health professionals the ability to access a shared national collection of public health data and information. The network decreases fragmentation in public health service provision by diminishing geographic and bureaucratic barriers. It links federal, state, and local practitioners and allows them to exchange data and information over the Web. The ability to communicate easily in this networked environment has helped a broad, geographically dispersed group build consensus around the benefits of strengthening shared infrastructure of this type. Public health workers gained appreciation for the importance of G2G sharing, and the potential of such projects, as they used the online tools in early versions of the network.

These examples of G2C, G2B, and G2G innovation demonstrate clearly that the virtual state entails much more than government putting information on the Web for access by the public. Some of the broad estimates of savings are impressive. The use of e-mail alone has been estimated by Ferris Research to generate an average annual savings of \$9,000 per office worker, or a productivity gain of 15 percent.⁷ Ferris calculated that this typical office worker saves, on average, 381 hours per year by using e-mail. The study even factored in nonproductive use of e-mail, estimating it at 115 hours per worker. The U.S. Department of Commerce has estimated that paper-based, traditional processing of the payments that flow into its offices costs between \$1.65 and 2.70 for each transaction, compared to \$0.60 to \$1.00 for Web-based processing. As noted earlier, expanded use of information-based technology reduces the hidden cost that individuals incur in dealing with the government. For example, the U.S. Office of Management and Budget estimates that businesses and individual taxpayers spend 6.1 billion hours annually in complying with federal tax law. Reckoning this time at \$30 per hour produces a total of \$183 billion per year. Similarly, the Tax Foundation and the U.S. General Accounting Office estimate compliance costs of 15 and 19 percent, respectively, of income tax collected.⁸

The potential efficiency gains alone should stimulate government executives to launch digital government projects. The estimated savings that could be realized have galvanized an industry of e-government vendors who are soliciting projects as government outsourcing increases. Cost savings and the benefits of increased public access to information and services, however, represent only a small subset of the promise of digital government. More important, however, is public dialogue about how digital government will be designed and implemented. The central issues are democratic in nature, rather than simply economic. How are conceptions of public service changing? How will dramatic modifications of access affect rates and types of civic participation? How will reliance on the public sector for design, implementation, and management of digital government affect the traditional boundaries between what is public and what is private? These are just a few of the pressing questions that move discussion of digital government beyond its economic importance to its broader implications for democracy.

The Challenges That Lie Ahead

The promise of the virtual state comes with considerable challenges that government decision makers and concerned citizens will face during the next decade of rapid development. Beyond simply developing the requisite infrastructure to handle the growth of electronic government, there is the need to guarantee equitable access for all citizens, and the obligation to safeguard individual privacy and ensure the security of transactions. Additionally, a host of governance issues, such as normative concerns about the appropriate role of the public and private sectors in developing and managing the public's information, will be encountered.

As of 1999, the distance between information haves and have-nots was growing rather than shrinking. Those who live in households with income of \$75,000 or more and located in an urban area are more than nine times as likely to have a personal computer in their home, and approximately twenty times more likely to have Internet access than those who live in a low-income household. Racial and ethnic disparities persist: an African American or Latino household in the United States is 40 percent as likely to have Internet access as a white household.⁹ Use of the Internet is correlated with an individual's ethnicity; race; age; income; and proximity to major business, technological and decision-making regions. As a sample of geographic disparity in access, just over 50 percent of those living in Washington, D.C., San Francisco, Austin, and Seattle/Tacoma currently use the Internet—but only one third or fewer of those who live in cities such as Pittsburgh, Tulsa, Birmingham, and Charleston/Huntington (West Virginia) use it.

Inequality of Internet access and use remains a fundamental problem to be addressed as decision makers allocate funds to build the virtual state. The cost savings of digital government are tied to the percentage of the public that

will use the Internet in their interaction with government. In the near term, government agencies have to maintain a dual capacity, managing both traditional and Web-based operations. Recent research suggests that in a political environment where the citizen is increasingly viewed as a customer, the wealthy customer may receive better treatment as digital government architectures are designed and implemented.¹⁰ If this is the case throughout government, then enacting technology with a customer focus and without conscious effort to reduce inequality may exacerbate the digital divide.

An increasingly digital government favors those with access to a computer and the Internet and the skills to use these sophisticated tools competently. Text-based service delivery over the Internet assumes literacy (and, typically, proficiency in English). Moreover, the complexity and enormous volume of government information on the Web requires people who use it to develop the skills needed to search for information and evaluate the output of search tools. Ironically, the very people who are poorly equipped to use digital government services may find themselves monitored by tools that are in fact Web-based, as health care providers, case officers for welfare and other entitlement programs, and criminal justice personnel increasingly collect and integrate personal information to aid decision making.

Another challenge derives from the enormous tasks of infrastructure building that lie ahead. The technical infrastructure required to build a virtual state is still in its early development in much of the country. Estimates of cost savings assume sufficient capacity to handle volume and high-speed Internet access and transmission. Transaction time also affects the reliability of digital government transactions and is, for this reason, a key element of building trust and security in these systems. The time required to transfer a ten megabyte file, roughly equal to the contents of six or seven floppy disks, varies from eight seconds to forty-six minutes depending upon the sophistication of the connection. Many legacy computer systems used in governments throughout the United States were not built for the interactivity of a Web-based application, or for the transaction volume envisioned in digital government.

In theory, a government agency can transfer enormous amounts of data in seconds, saving government and the public time and money. In practice, efficiency depends on several factors: the type of technology the public agency uses to connect to the Internet, the policies government decision makers develop to guide data sharing and transfer, and a growing number of security and privacy issues.¹¹ Given current stringency in most government budgets, funding for information infrastructure remains a serious impediment to developing digital government.

Privacy and security loom as urgent and important policy issues as government moves toward a greater level of online interactivity with the public, including transfer of funds and private information such as that found in tax returns, financial aid applications, medical histories, and social security filings. Information systems are vulnerable to white collar criminals, hackers, and

thousands of “bugs” or errors in computer programs that have been patched together during several decades of incremental, at times poorly documented, system development. Increasing networked connection also increases the vulnerability of information systems to power outage, sabotage, and unanticipated problems in tightly coupled, interdependent computerized systems.¹²

A third set of challenges relates to governance using new information tools and institutional structures whose features differ from the bureaucratic state of the twentieth century. Web-based and organizational networks are not yet so extensive as to give the public manager anything more than a foretaste of what may be coming. Eventually, boundaries in cyberspace and in organizational networks may become as important as the traditional bureaucratic boundaries within which a public agency has traditionally operated. What will be the impact on public management in these new governance structures? An outline is beginning to emerge from innovations around the country.

Public executives and managers in a networked environment can no longer afford the luxury of relegating technology matters to technical staff. Many issues that appear to be exclusively technical are also deeply political and strategic in nature. In some cases, new use of technology furthers an existing agency or program mission. But in others, using the Internet can play a transformative role and lead to expansion or rethinking of mission and change in internal and external boundaries, accountability, and jurisdiction.

The rules of the game in public management have long rewarded agency-specific endeavors. Agency autonomy protects the integrity of policy areas, programs, and clients through clear jurisdiction, line items in the budget, and procedures for accountability. Success in a government agency has often meant increasing (or at least maintaining) program budgets, staff, and other resources. Internal agency conflict could be solved, reconciled, or dampened through bureaucratic governance structures and processes.

The rules of the game for the manager in a networked environment—the sort that increasingly accompanies digital government—are different. Partnership across jurisdictional boundaries requires cooperative behavior and the ability to coordinate, often without a clear governance structure. Many of the advantages of the Internet come from building interorganizational networks, a process that requires considerable executive leadership and skill. One of the challenges now facing the government executive is that multiple rules and multiple games are currently in play, each of which possesses its own internal logic.

Executives must master the technological game if they are to use the Internet strategically rather than simply following fashion, contractors, or the lead of a best-practice agency in their field. In addition, the public manager must remain an astute player of the bureaucratic game, while also becoming proficient at the network game so as to establish productive and useful partnerships in a time of scarce and diminishing resources in government. Public service has never been more challenging; as a virtual state is being developed, it has rarely been more exciting or important.

Increasing use of the Internet is creating a network society and networked government. But close examination of current organizations and institutions reveals that many potentially useful connections remain unforged, and numerous opportunities to gain prospectively stunning efficiency or to build joint problem solving capacity in complex policy areas remain unexplored. The Internet is often used to reinforce an old institutional structure rather than open the possibility for innovative public service.

Some experienced political actors downplay the significance of contemporary technological change by arguing that politics will not change in a digital environment.¹³ Although it seems likely that technological change as significant as that enabled by the Internet will lead to deep structural change in government, the degree of its impact on politics is open to reasoned disagreement. Too few analyses of digital government treat technology and politics with equal seriousness. In most treatments of digital government, technology is viewed as if it alone would usher in a transformation of the state and as if politics and current institutions could be ignored in such a transformation.

An important series of questions for governance relates to the nature of the public-private policy network and the roles of the public and private sectors in designing, developing, managing, and controlling the virtual state. Economic incentives in the private sector help to generate rapid, innovative solutions and applications that are highly beneficial for government. Private sector vendors of digital government, along with professional service firms, have aggressively targeted construction and operation of the virtual state as an enormous and lucrative market to be tapped.

But information architecture, both hardware and software, is more than a technical instrument; it is a powerful form of governance. As a consequence, outsourcing information architecture and operations is, effectively, outsourcing of policy making. Public servants and others who hold the public trust bear grave responsibility to forge long-term policy that guards the interest of citizens and that protects the integrity of citizen data and public information. The responsibility may make governments seem slower moving than the private sector, lacking in strategic power, or unsophisticated relative to best practices in the economy. But as we build a virtual state, public servants are needed more than ever to guard the public interest.

Notes

1. The author gratefully acknowledges the support of the Visions Project of the Kennedy School of Government at Harvard University, the Brookings Institution, and the Internet Policy Institute for support of the author's research on digital government. For a detailed examination of the research, data, and policy implications presented in this article, see Fountain, J. E. *Building the Virtual State: Information Technology and Institutional Change*. Washington, D.C.: Brookings Institution Press, 2001.

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