14. Goverment

One of the pillars of every community is its system of government. Many government functions, such as collecting taxes and running elections, involve the collection and dissemination of information. Thus, governments can use information technology (IT) to solve a host of problems.

Because IT facilitates the collection, analysis, and distribution of information, its use penetrates all layers of government and government agencies regardless of size or mission. Governments can use IT for mission support. Governments can use electronic record management systems to help ensure secure data storage, easier

access to information, and more accountability. Governments can also use IT to reduce operational costs by, for example, implementing telework and teleconferencing solutions to save money on office space and travel expenses. In addition, governments can develop large-scale IT solutions to address specific problems such as border control, national defense, law enforcement, and health care. In fact, the possible applications for IT in government, just as in industry, are nearly limitless.

ism and overtime, the city of Baltimore eliminated $13 million in unnecessary government spending in the first year of the CitiState initiative.[1] Later, when O'Malley became governor of Maryland, he created the similar StateStat program to help manage the state government, as well as the BayStat program to assess progress on revitalizing and protecting the Chesapeake Bay.[2]

Just as businesses use IT to cut costs, in part by encouraging customers to use low-cost service deliv-

> ## For each tax return filed electronically instead of on paper, the IRS saves an estimated $2.15 per return and the error rate declines from 20 percent to under 1 percent.

Although e-government's potential still remains largely untapped, a whole host of benefits can already be seen among technology-savvy agencies at all levels of government. As discussed below, some governments have used IT as a catalyst for modernizing government and improving the efficiency and quality of government services. In addition, some governments have transformed themselves and empowered their citizens by streamlining their activities and processes to facilitate citizens' access to information, as well as by creating more openness and transparency in government operations to allow better public oversight.

Making Government More Efficient

A primary use of IT in government is to improve the efficiency of government operations. Although the scale and scope of projects vary, the productivity benefits gained when government agencies adopt IT to improve efficiency translate into direct savings for taxpayers or better allocation of government resources.

The idea of using IT to track various performance indicators in government was pioneered when Baltimore Mayor Martin O'Malley implemented CitiStat, a program that uses IT for a real-time data-tracking and management tool to help manage the city government's performance. By using IT to track various performance indicators such as employee absentee-

ery channels like the Internet, so too is government using IT to cut costs. In the United States, the U.S. General Services Administration's online purchasing and acquisition system—GSA Advantage!—yields savings of $90 to $240 in administrative costs per transaction compared to manual purchase orders.[3] Similarly, the Internal Revenue Service's (IRS) single point of access for free online tax preparation and filing services by private companies—the IRS Free File system—has saved millions of dollars in processing costs for the almost 20 million tax returns that have been filed electronically since the program's inception in 2003.[4] For each tax return filed electronically instead of on paper, the IRS saved an estimated $2.15 per return, and the error rate on returns submitted declined from 20 percent for paper returns to under 1 percent for electronic returns.[5] In addition, because the private companies performing tax preparation and filing services are competing intensely for market share, they have strong incentives to make their programs as easy to use and comprehensive as possible.

The success of the partnership between the IRS and online tax preparation and filing services illustrates an important point: IT solutions for government do not necessarily need to be operated by government. The private sector routinely uses IT to enable partnerships and outsourcing to enhance innovation and cut costs. The United Parcel Service, for example, uses its extensive transportation and IT network to run the logistics operations of many

companies. Governments can also move beyond engaging with companies simply as e-government vendors and instead empower third-party for-profit and nonprofit organizations to act as partners in the provision of e-government services.[6] The U.S. Library of Congress, for example, decided to make available thousands of photos from its archives by partnering with the commercial online photo sharing service Flickr rather than build its own online photo archive.[7]

Governments also can become more efficient by developing applications that build on existing private-sector tools. In Washington, D.C., for example, the city's chief technology officer found that rather than spending millions on an enterprise system, the city in some cases could take advantage of free Web-based tools such as Google applications, open-source tools, and low-cost Web-based software to rapidly deploy new government applications for citizens and collaboration tools for its employees with less cost to the city.[8] At the state level, the Alabama Department of Homeland Security built a central online repository of county data, maps, and imagery and integrated the information with Google Earth, a virtual globe application. Dubbed "Virtual Alabama," the online system is a digital clearinghouse for government maps, photos, and logistical information on all 67 of the state's counties that allows state and federal government agencies to quickly access that material. First responders, for example, can use the "Virtual Alabama" system to survey damage before, during, and after a disaster for operational planning, asset tracking, and critical infrastructure mapping.[9] By integrating all of this functionality and data into a single online application that serves the needs of multiple agencies, the state government spread the cost of the system across multiple partners. Moreover, by creating an easy-to-use platform for data sharing and collaboration, the state has created an incentive for counties to create and share better data.

Providing government services online, a form of e-government, can often provide significant savings to governments and government service users. The renewal of a driver's license, for example, costs the government about $1 if done online, whereas it costs about $8 if done in person. Many e-government initiatives allow citizens to interact with government through the Web, thereby saving taxpayers money

and often improving service. As an example, the Kansas Highway Patrol put crash logs on a website called Online Crash Logs, thereby streamlining the process of recording and distributing crash information by reducing the amount of paperwork dispatchers must complete and also by greatly reducing the number of phone calls from the public and media; now the media and public can check crash logs often and view the most current, accurate crash information without impeding the daily operations of the dispatchers.

Improving Government Services

IT is used not just to improve the efficiency of government services but also to improve the quality of government services. IT is especially useful at improving government efficiency and reliability in large-scale applications for basic government functions, such as running an election, conducting a census, and collecting taxes. By automating a variety of tasks, government agencies can increase productivity and improve the quality of services delivered to citizens, businesses, and other government entities.

Many governments around the world have adopted IT to improve their voting processes for the simple reason that computers can count much more reliably than humans. The technology used in voting varies by jurisdiction. It ranges from touchscreen electronic voting machines to optical scanners for paper ballots[11] and even includes an Internet voting platform developed by the Republic of Estonia to increase voter participation and convenience.[12] Internet voting is particularly promising for voters living abroad who might otherwise not be able to participate in elections. In Florida, for example, the Operation BRAVO Foundation is working with Okaloosa County to create an Internet-based voting system for the 20,000 active duty military members who vote in the county but are currently living abroad.[13] Many national statistics agencies have invested in IT to more efficiently collect, process, and distribute survey data in their national census. Statistics Canada, for example, provides multiple online tools to allow researchers to access and manipulate survey data and in 2006, 19 percent of Canadians responded to the census questionnaire online.[14]

Investments in IT often benefit citizens directly in the form of improvements in government services. Initiatives like the CitiStat program in Baltimore allow managers to better track the performance of basic city operations such as trash removal, street repairs, and snow removal. CitiStat also tracks calls by residents to a 311 non-emergency complaint call center, so government officials can identify trends and ensure departments appropriately respond to requests.[15] In New York City, when residents contact 911 or 311, they can also submit pictures and video to the call center to help record their complaint. A website opened by the government of Italy, Denuncia vi@Web, enables citizens to report a crime online. This simplifies the process citizens use to report crime by reducing the amount of paperwork and also makes it possible to report a crime anywhere at anytime.[16]

Other uses of IT simply make government more customer-friendly. In Virginia, for example, residents can log on to the Department of Motor Vehicles website to check the wait time for service at regional offices to decide when and where to go. Once government successfully digitizes information, it can focus on developing the most effective tools and applications to meet the needs of citizens. A pilot project in Belgium called Multigov is evaluating different platforms to allow government-citizen interactions outside of the traditional face-to-face, telephone, and Internet by branching out into emerging areas such as electronic kiosks, interactive digital television, and mobile services.[17]

E-government initiatives that streamline government functions also can benefit businesses and save them money. Often government regulatory hurdles impose significant costs on businesses and decrease productivity. At one time, for example, starting a new company in Beijing required an application to eight government agencies and the coordination of multiple in-person meetings. In 2000, Beijing's mayor launched an initiative called Digital Beijing to simplify the application, reporting, and administration processes. Investors in Beijing can now conduct all of these activities from a single website that shares information across multiple agencies.[18]

Governments elsewhere have adopted IT systems to improve business-government interactions such as processing imports and exports. In the Philip-

pines, for example, the Customs Bureau invested in an IT system to automatically process import clearance documents, payments, and release orders for shipments. By automating this process, the Customs Bureau eliminated many of the bureaucratic delays and corruption that had mired their paper-based system.[19] In the United States, the state of Ohio established an e-tax reporting system that lets business taxpayers enter information common to all municipalities once, and then automatically distributes the information to all appropriate entities. Previously, businesses had to understand and comply with a patchwork of requirements and processes across the range of municipalities in which they conduct business.

Governments can also use IT to more effectively use their natural resources. Alabama's Office of Water Resources has launched an initiative to create a digital map of the state's waterways using global positioning system (GPS) technology. Using this information, state officials will be better able to protect waterways during natural disasters such as hurricanes or droughts and plan statewide water resource allocations. The GPS data may also facilitate the state's industrial recruitment by showing perspective firms exactly where water resources are located.[20]

Facilitating Citizens' Access to Information

Governments are using IT to empower citizens by facilitating their access to information. The U.S. Government Printing Office, for example, provides online access to databases containing the full text of public documents produced by the three branches of government. In addition, the U.S. General Services Administration runs USA.gov, a national portal for government services. Similar portals for online government services can be found in many other countries. In the United Kingdom, Directgov provides a portal to public services of the government, and the National Archives is home to multiple online databases of digitized public documents including government publications and historical documents dating as far back as the 8th century such as census records, immigration documents, family records, and military records.[21]

IT enables legislators and citizens around the

world to discuss best practices and policies. An online clearinghouse of policy ideas called e-Parliament, for example, helps connect legislators with experts on global problems and legislative solutions employed by different governments to address various problems. Their first poll on energy issues engaged 600 legislators from 63 countries.[22]

Government agencies can use IT not only to increase access to public records but also as a platform to distribute a whole host of educational materials online—from history and civics lessons to medical information to information about government services and initiatives available to their citizens. In the United States, for example, the Small Business Administration provides a wide array of resources, training and tools on its website to help citizens launch, manage and grow their businesses.[23]

Even governments in the less developed countries can use IT to help increase access to information. In rural Sri Lanka, most community members are prevented from using the Internet to get information by barriers such as the lack of access to computers and the Internet, digital literacy, and language. To respond to this challenge, Sri Lankan government ministries helped form the Kothmale Community Radio Internet Project—an interactive radio program that provided listeners a virtual Internet

Transport Authority (RTA) has created AskDubai, an online service that allows citizens to request information on RTA services, make department inquiries, and report problems.[25] In the United Kingdom, a website linking U.K. citizens and their government called My Society has a program called Fix My Street that enables the public to coordinate with others in their community and their local Member of Parliament to solve neighborhood problems such as graffiti and to repair roads.[26] Similarly, citizens in Los Angeles can use an online application to report recent tagging incidents, providing on-the-ground intelligence to officials in charge of abatement and making their graffiti mitigation programs more comprehensive, cost-effective, and efficient.[27]

IT is also helping to automate government services that previously required bureaucratic hassles, such as requesting government documents. In Austria, for example, citizens no longer need to request birth or marriage certificates. The country's e-government registry automatically forwards the necessary information to the appropriate agency.[28] Government agencies and officials also rely on technology to communicate with their customers and constituents by using websites, e-mail, and syndicated news feeds (e.g., using RSS formats). Government agencies have also established online forums to foster

> ## Initiatives like the CitiStat program in Baltimore allow city managers to better track the performance of basic city operations such as trash removal, street repairs, and snow removal.

browsing experience. Broadcasters browse the Internet on behalf of their listeners and then explain and discuss the information with guests (e.g., a doctor might be invited to explain information on a health website).[24]

IT is also improving communication between citizens and government through Web-based interactions. At a local level, residents in many jurisdictions can report problems such as potholes in the road or broken fire hydrants through Web-based forms or by editing citizen-generated maps online. Citizens can use e-mail to contact their representatives and voice their positions on legislative proposals or other issues of concern. In Dubai, for example, the Roads and

discussion on policy proposals between citizens and government officials and created blogs to provide a more direct window into government

Promoting Government Transparency and Accountability

Recent advances in IT enable citizens to hold government officials more accountable for fraud, waste, and abuse. Before the Internet, citizens had few resources to learn about the myriad government agencies and services available to them or about the effectiveness of various government programs. Governments were

held accountable primarily by professional journalists or internal government reviews. The Internet has changed everything by making it possible for governments to operate more openly and with more citizen oversight.

In recent years, more and more government agencies have created a Web presence and given citizens the opportunity to review their budgets, accomplishments, and practices. In Colombia, for example, the president led an e-government initiative to establish useful websites across the federal government with the purpose of increasing accountability; in less than a year, almost every government agency in the country had a website containing the agency mission statement, contact directories and budget information and the federal government had launched a central government portal.[29] In 2007, Google partnered with California, Virginia, and other states to implement a new site map protocol that makes all search engines more effective in indexing information the states had made available online but had been difficult to find.[30]

IT can also make information about government oversight more timely and relevant. By creating the electronic financial disclosure system EDGAR, the U.S. Securities and Exchange Commission has been able to streamline the collection and dissemination of company information on regulatory compliance to investors, companies, and third parties.[31] The Web-based EDGAR system not only decreases bureaucracy but also puts financial data in the hands of ordinary investors. An annual subscription to EDGAR costs less than one-sixth what a subscription

proper oversight and reduces government waste. Thus, some governments have used e-procurement systems to increase supplier choice and reduce corruption. In Chile, for example, government agencies had no standardized procurement process prior to 2003. That year, the Chilean government launched an e-procurement initiative called ChileCompra to make the procurement process more transparent, efficient, and accessible. The government posts procurement announcements on a website, and the results of all bids are posted online. In 2007, Chile reported that over 900 agencies had used the ChileCompra system to conduct USD $4.5 billion in transactions. Businesses benefit from increased access to the government market. The government even established 16 regional "entrepreneurial centers" to help small businesses gain access to this market.[33] The Chilean government also benefits from increased competition and saves approximately USD $50 million annually in public expenditures.[34]

In many countries, IT has actually reshaped the influence of money in politics. Until recently, citizens could do little to lift the veil on campaign financing. Even with campaign finance disclosure laws, few individuals have the resources to wade through stacks of filings to discover who has sponsored individual candidates, political parties, or political organizations (e.g., political action committees). Countries that have adopted electronic filing and reporting requirements for campaign contributions provide much more transparency in the political process. In the United Kingdom, for example, the Electoral Commission provides a searchable

> **Websites such as WikiLeaks.org provide whistleblowers an untraceable forum for anonymously posting documents that expose unethical behavior or oppressive regimes.**

to the information cost prior to electronic collection. In addition, research has shown that the added transparency afforded by EDGAR has affected the stock market: when the electronic fillings were first published, stock prices changed dramatically as fund managers incorporated the new information into their pricing predictions.[32]

Increased openness and transparency helps ensure

database of campaign contributions and expenditures of candidates and parties. In the United States, similar information is provided by the Federal Election Commission. In addition, nonprofit organizations have developed websites such as OpenSecrets.org and FollowTheMoney.org that provide citizens with tools to better understand this government data by, for example, allowing them to easily find who

in their neighborhood has donated to a particular political candidate.

Sometimes, when citizens do not feel the government has created enough openness and transparency, nongovernmental organizations have launched IT-based projects to increase accountability. In the United States, projects such as the National Security Archive have created an online, searchable archive of declassified government documents relating to national security, foreign, intelligence, and economic policies that have been previously unreleased.[35] Another project, Open CRS, provides an online database of Congressional Research Service reports that are otherwise unavailable to the public.[36] The website LegiStorm provides information on Congress such as salaries of members and staff, privately financed trips, foreign gifts and financial disclosures.[37]

The Sunlight Foundation has set up a website that serves as a clearinghouse for government information in the United States. The site allows users to search thousands of government documents to analyze anything from campaign contributions to legislation and earmarks in order to detect abuse. The Sunlight Foundation's database has helped uncover several public officials that have used their political power inappropriately.[38] Similarly, OMB Watch, a government watchdog group, has created FedSpending.org that has tracked $16.8 trillion in U.S. federal government expenditures.[39] Likewise, to enhance public oversight of government programs, the Environmental Working Group has created an interactive website to show exactly where and to whom farm subsidies are being paid.[40] Outside of the United States, websites such as WikiLeaks.org provide whistleblowers an untraceable forum for anonymously posting documents that expose unethical behavior or oppressive regimes. The website primarily focuses on Asia, the former Soviet bloc, Sub-Saharan Africa and the Middle East, and as of 2008, the website had collected over 1.2 million documents.[41]

IT is enabling governments to benchmark the quality and effectiveness of their services. In Baltimore, the CitiStat program, mentioned earlier, looks at data in order to identify strengths and weaknesses in government programs. The city collects and puts in an easily understandable form a wide range of data on topics including the amount of overtime worked by employees, the frequency and type of citizen complaints, and response-time to specific cases.[42] One of the keys of CitiStat is its emphasis on the accountability of managers. The CitiStat system can be used to hold mid-level managers accountable, who in turn have tools to hold front line workers more accountable. Such systems can also make government more transparent, increasing pressures from citizens for even better performance. On a broader scale, the National Neighborhood Indicators Partnership (NNIP) at the Urban Institute partners with city governments around the United States to develop neighborhood information systems to monitor the state of their communities.[43] NNIP assembles data from multiple partners to allow local leaders to compare the effectiveness of different strategies for policy challenges such as welfare reform and prisoner reentry.[44] The Boston Indicators Project (BIP), another local initiative, is a collaborative effort of academics, civic leaders and residents to define, measure, and track progress on a variety of civic goals in the Boston metropolitan area. BIP aggregates data from multiple sources and makes the data and analysis of the data freely available on its website. BIP covers indicators from 10 different sectors ranging from traditional demographic trends such as home ownership and crime to environmental measurements such as green space distribution (acres per 1,000 children) to trust between neighbors. All of these different projects help democratize access to information and foster informed civic discourse.[45]

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About the Information Technology and Innovation Foundation

ITIF is a non-profit, non-partisan public policy think tank committed to articulating and advancing a pro-productivity, pro-innovation and pro-technology public policy agenda internationally, in Washington DC and in the states. Recognizing the vital role of technology in ensuring American prosperity, ITIF focuses on innovation, productivity, and digital economy issues.

Technological innovation, particularly in information technology, is at the heart of America's growing economic prosperity. Crafting effective policies that boost innovation and encourage the widespread "digitization" of the economy is critical to ensuring robust economic growth and a higher standard of living. However, as in any new and changing situation, policymakers have varied awareness of what is needed and what will work. In some cases legislators have responded to new and complex technology policy issues with solutions more suited for the old economy. And as the innovation economy has become increasingly important, opposition to it from special interests has grown. Finally, the excitement that the press, pundits and decision makers showed toward the information technology (IT) revolution in the 1990s has all too often been replaced with an attitude of "IT doesn't matter." It is time to set the record straight—IT is still the key driver of productivity and innovation.

As a result, the mission of the Information Technology and Innovation Foundation is to help policymakers at the federal and state levels to better understand the nature of the new innovation economy and the types of public policies needed to drive innovation, productivity and broad-based prosperity for all Americans.

ITIF publishes policy reports, holds forums and policy debates, advises elected officials and their staff, and is an active resource for the media. It develops new and creative policy proposals to advance innovation, analyzes existing policy issues through the lens of advancing innovation and productivity, and opposes policies that hinder digital transformation and innovation.

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