

From Keystone to E-Stone: Pennsylvania's Transition to E-Government

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Executive Summary

We report five findings and implications from our study of the Commonwealth of Pennsylvania's efforts to more directly employ information and communications technologies (ICT). Between 1995 and 2002, Pennsylvania was able to move from being one of the laggard states to being one of the leading states in uses of ICT to support improved governmental operations (which we refer to as Digital or D-Government) and to increase interaction among citizens, businesses and government (which we refer to here as Electronic or E-Government).

We focus on Pennsylvania's efforts during 1995 through 2002 for two reasons. First, it was during this period that the public sector began to aggressively consider distributed and networked ICT as a means to improve governmental operations, as well as the interactions among government and external stakeholders, such as citizens and businesses. Second, during this same period, Pennsylvania's efforts were successful enough to move the state from a lagging position to becoming one of the leaders in engaging computing for digital and e-government purposes.

There are three inter-related efforts that helped catalyze Pennsylvania's successes:

1. Executive leadership advocated using ICT as the means for achieving the administration's goals. This included actively engaging in (and sometimes hosting) important technology meetings, constantly highlighting technology opportunities to the public, and providing both financial and personnel resources to help move forward computing initiatives. While the importance of senior leadership to ICT-enabled organizational change is well known, here we showcase *how* executive leadership makes a difference.
2. The administration created and engaged a central office to oversee computing innovation, and created a chief information officer (CIO) to lead this effort. The Office of Information Technology (OIT) was created as part of the Office of Administration (OA), a powerful state-level agency with both a strong leader and close ties to the Governor. In turn, OIT became a central actor in ICT projects, funding, and in particular as the champion of e-government initiatives. In both creating and then engaging OIT as the lead unit in e-government and digital government initiatives, the Ridge/Schweicker administration altered existing organizational arrangements, raising the visibility and value of ICT activities. We provide insight into how states can effectively use the CIO to support change.
3. The Pennsylvania executive leadership initiated programs that helped to expand the ways in which ICT-focused projects, and particularly e-government projects, could be funded and administered. A key example is the Technology Improvement Program (TIP) that provided OIT a means to fund innovations. This study provides insights into mechanisms and principles useful to initiate ICT-enabled organizational change.

There are two more general points that we take away from Pennsylvania's efforts:

4. Evidence suggests that it is more viable to effect institutional change by creating new units (or perhaps dissolving existing units) than by changing current units. The new entity argument suggests that change to existing governmental operations requires structural changes. These structural changes mean, in practice, that when new organizational units are

created they must be provided adequate resources, that their presence changes the existing lines of reporting and control, and finally that they take an active role in reshaping or leading operational processes. For example, the OIT, through its many programmatic innovations, altered existing operational processes. Its very existence altered the organizational structure of the Pennsylvania Commonwealth government by facilitating technological innovations.

5. Evidence indicates that organizational activities and technological changes are both intimately linked together and path dependent. That is, Pennsylvania's experience suggests the actions of government actors and resulting technological change are inseparable and past decisions regarding ICT will both frame and guide future choices. Furthermore, that public sector uses of distributed computing platforms such as the internet, WWW, and desktop (or server-based) computing requires strong, centralized ICT administration, one that has both budgetary and intellectual oversight.

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Introduction^{*}

Through the mid-to-late 1990's, many United States' federal, state and local governments began to engage in information and communications technology (ICT) focused efforts to support digital government initiatives. There was widespread optimism that the internet and the world wide web would help to change the ways in which both citizens and businesses interacted with their governments, as well as the way governmental units interacted with one-another, and expand the scope of services that governments might provide. This mirrored, in many ways, the movement towards mainframe-based computing in government that dominated much of the 1970's¹.

In this monograph, we report on, and analyze, Pennsylvania's efforts to engage digital government and, subsequently, electronic government or e-government, during the late 1990s. There are at least four reasons to focus on Pennsylvania's efforts.² First, in the context of the 50 states' collective and parallel efforts to engage digital government during this period, Pennsylvania was able to move from being one of the laggards to being one of the leaders. This suggests that their approach led to a higher level of achievement in a shorter time span than most other states. Second, we can draw on Pennsylvania's relatively successful effort to engage digital government to derive several key principles underlying its success. Third, we examine the efforts of the Office for Information Technology (OIT) to transform the Commonwealth's ICT systems, allowing us to focus on key institutional innovations that were employed to facilitate ICT development. Finally, we attempt to distill a set of managerial lessons to consider when engaged in large-scale ICT system development within government. This report draws on a longitudinal case study, the details of which are reported in Appendix A.

A Prelude to Developing E-Government in Pennsylvania

In the early 1990's, Pennsylvania's government was composed of approximately 152,000 full-time equivalent (FTE) employees, and state government revenues totaled approximately \$36.7 billion while the Commonwealth's population totaled approximately 12 million citizens (U.S. Census, 1992). In 1996, Pennsylvania was ranked 47th in rate of job growth and the state's economy depended on traditional manufacturing-based industries. As Table 1 shows, 19.9% of the workforce was employed in manufacturing durable or nondurable goods, 6.09% in construction-related activities and 21.4% were employed by whole or retail trade industries. The state seemed to be lagging behind other states, not only in job growth, but also in the direction of economic growth. Pennsylvania was often perceived to be the state dependent on traditional blue-collar activities, such as coal and steel, rather than one developing niches in the new sectors of an emerging high-tech economy.

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¹ For more on this, see Danzinger, Dutton, Kling and Kraemer's 1982 book entitled "Computers and Politics: High Technology in American Local Governments."

² For the purposes of this study, we consider the broader use of ICT to facilitate governmental operations as digital government and the use of ICT to deliver services to the public to be electronic government.

Not surprisingly, by the time Tom Ridge took office in 1995, there was a perceived need within state government (and across the Commonwealth) that it was time to move the state economy and labor force toward new forms of economic development that focused less on traditional blue-collar manufacturing jobs. A key focus of the Ridge campaign, and of his administration, was to make the state more attractive to high-tech industry by providing a business-friendly government environment that was administratively effective and efficient.

Such an administrative transformation was to be partly achieved through the effective use of information and communication technologies (ICT). However, the Commonwealth's government was also seemingly stuck within an outmoded technological paradigm. One report undertaken early in Ridge administration indicated that, while Pennsylvania's annual investment in electronic data processing and telecommunications was estimated to be \$275 million, most agencies lagged behind common industry standards for information systems management. For instance, Commonwealth agencies spent 29% more on applications development and relied more heavily on 3rd generation languages than similar organizations. Sixty-two percent of applications were written and maintained in COBOL, as compared to 42% in similar organizations (Governor's Office of Administration, 1996; IMPACCT, 1996).

More broadly, ICT leadership was diffused and agency-centered. Thus, agencies often held firmly to a belief that each agency should have control of the information that it generated and used, as well as the hardware and software used to manage it. Thus, by the mid 1990's, there were seventeen data centers, each operating relatively independently, with little data integration across agency boundaries and little in the way of oversight from outside the agencies themselves. Moreover, systems were failing, downtime was rising, service-levels were dropping, as was the morale of the Commonwealth's technical staff. Furthermore, Pennsylvania lagged behind most other states in the establishment of a government-wide presence on the WWW, becoming the 48th state to have one (in October of 1995); only West Virginia and Mississippi trailed Pennsylvania onto the web.

In 1995, newly-elected Governor Ridge commissioned the "Improve Management Performance and Cost Control Task Force", or IMPACCT. Their report, published in 1996, recommended the Commonwealth develop a long-range ICT management strategy, improve the cost effectiveness of ICT investments, better serve citizens through the use of ICT, employ ICT to make the Commonwealth more competitive, improve the use of ICT by regulatory agencies, and improve the operations of agencies through the use of ICT. The report stated that initial investments in the state's ICT and telecommunications infrastructure could ultimately yield a 5-10% savings in the state's annual ICT outlays. The report specifically recommended seven strategic actions with regards to state government ICT investment:

- Reexamine agency policies regarding the sharing of information;
- Alter personnel policies in order to provide competitive compensation for high level ICT managers and technical staff;
- Move toward off-the-shelf application procurement instead of in-house development;
- Create an inventory for reuse of software packages already developed by the Commonwealth;

- Select a suite of software engineering tools for use by all agencies in developing new custom applications;
- Move toward the development of relational databases;
- Revise procurement standards to ensure that they meet required standards, improve competition, and reduce vendor prices.

The IMPACCT report clearly highlighted the administrative and economic gains that could be achieved if the Commonwealth's agencies made more effective use of ICT and, therefore, provided a justification for new investments in ICT by the Commonwealth's government.

In addition to the IMPACCT report, the Commonwealth contracted with Arthur Anderson in early 1996 to provide a comprehensive strategic plan for ICT within the state's administration. This report, *Breaking Through Barriers: A New Direction*, provided three important guiding elements for the improvement and development of the state's ICT systems: a strategic vision, a baseline assessment of current practices, and a governance structure for the accomplishment of institutional goals (Commonwealth of PA, 1996). This report essentially provided the Ridge administration with an external evaluation of the government's ICT resources, as well as recommendations on strategic paths to take, moving beyond the bureaucratic agency-centered model of ICT management and toward an ICT governance structure that was policy and results oriented. While Pennsylvania may have been somewhat of a laggard in the use of advanced ICT in the mid-1990s, the IMPACCT and "*Breaking Through Barriers*" reports foreshadowed new governmental initiatives directed at improving both the use of ICT within government agencies and the use of ICT to communicate with, and provide services to, key stakeholders such as businesses and citizens.

A Postscript to Transformation: The After-Action Evaluation

By 2001, the benefits of this new emphasis on ICT improvements were visible. Pennsylvania had moved toward a more effective use of digital government strategies and practices. External assessment of the Commonwealth's overall ICT infrastructure and management during the Ridge/Schweicker administration was relatively positive. Studies, such as the Government Performance Project (GPP), graded the Commonwealth's management of IT as a "B" in 1999 and as a "B+" in 2001. While the use of letter grades makes comparisons difficult, only six states (Michigan, Montana, Tennessee, Virginia, and Washington) received higher grades in 1999 and only six states (Kansas, Michigan, Montana, Utah, Virginia, and Washington) received higher grades in 2001 (Barrett and Greene, 2001).

Pennsylvania's digital services for citizens and businesses, or e-government, focused on developing a government-wide website, or portal, to facilitate information dissemination and service delivery. Evaluations of the state's web portal, PA PowerPort, consistently rated it at, or near the top of the list when compared to other state web portals. For example, researchers at Brown University rated state web presences according to a survey of chief information officers and the evaluation of website content. Studies conducted in 2000 rated PA's PowerPort portal as 4th best behind Texas, Minnesota, and New York, respectively (West, 2000). Follow-up studies conducted by the same research team in 2001 and 2003 rated PA's PowerPort as 8th and 7th best, respectively (West, 2001; West, 2003). Another evaluation conducted by *Government Technology Magazine* rated the PowerPort as 2nd best state government portal in 2001 and 3rd

best in 2002. In both years, PA's portal was designated a "Best of the Web" site.

This collection of multiple positive external assessments suggests that the efforts Pennsylvania made towards embracing ICT were both successful and noticeable. This progress and success is even more impressive given the level of disarray relative to ICT that characterized the Commonwealth's government in the early-to-mid 1990s. Moreover, this progress must also be measured against the concurrent efforts going on in the other states. Thus, Pennsylvania's journey from near the bottom to near the top of the 50 states is even more noteworthy when considered relative to other states simultaneously working toward similar goals.

Facilitating the Development of Digital Government

The Commonwealth's government made noticeable strides in adopting more modern practices with regards to the management and use of ICT. The adoption of new ICT management practices and procedures to create a more effective digital government served as the technological foundation required to move toward the use of newer, more-advanced technologies, such as the internet and World Wide Web (WWW), to enhance communication between government actors and their stakeholders, whether they be individual citizens, nonprofit organizations, or private sector firms. In essence, a solid foundation in digital government activities and practices was seen as a necessary prerequisite for developing an effective e-government. The Office for Information Technology (OIT) would act as a facilitating and coordinating unit for the Commonwealth's ICT projects and initiatives.

Coordinators, Facilitators, and the ICT Nexus: Office for Information Technology (OIT)

Prior to the creation of OIT, Pennsylvania did not have a central organization concerned with the coordination and planning for ICT within the Commonwealth. Administrative agencies and departments were responsible for the management and development of their own ICT systems, with little in the way of institutional level coordination. Seated within the Governor's Office of Administration and headed by Richard Walsh, Deputy Secretary for Information Technology, the mere creation of the OIT and the appointment of Walsh to be essentially the Commonwealth's Chief Information Officer (CIO) in 1993, served as a step forward with regards to facilitating and coordinating ICT development within and across the Commonwealth's administrative agencies. Later, when Tom Ridge became governor, Tom Pease was hired as Secretary of Administration. Pease then appointed Larry Olson as the Deputy Secretary for Information Technology, who would initially head up OIT during the Ridge administration. OIT's position within the government would give it direct access to the Governor and other high-ranking elected officials, and serve to provide it with the political and managerial clout necessary to push for administrative reforms with regards to ICT within the government. Furthermore, OIT was composed of project managers who had experience with, and dedication, to state government and policy making, as well as experience with evaluating ICT initiatives. By the end of the decade, OIT had taken a central role in establishing a more effective infrastructure with regards to digital government activities within state agencies, and had helped initiate e-government activities that would be recognized as nation-wide examples of excellence.

[Insert Organization Chart of Department of Administration about here]

From its creation through the advent of major e-government initiatives late in the decade, OIT

was at the nexus of most major ICT initiatives within Pennsylvania state government. It is OIT's key role as a government-wide ICT facilitator that makes it an important organizational unit to examine. Many of its actions serve to highlight the need for centralized comprehensive planning and capacity building when developing innovative e-government applications and policies. For example, the ICT projects that OIT initiated and developed in the mid-to-late 1990's provided, not only a more sound technological and administrative foundation on which to build the state's e-government initiatives, but it also provided OIT with valuable experience and knowledge with regards to building relationships with agency officials and various external actors, such as private sector ICT vendors, businesses, and citizens. In essence, the early effort invested in developing the administrative and technological back-end of the Commonwealth's ICT infrastructure would facilitate the eventual development and consummation of one of the best e-government systems in the country.

Developing the Digital Government Foundation for E-Government Innovation

The development of online services, the most obvious component of e-government, is too often considered separate from the broader technological and administrative environment in which a government operates. For example, many scholars examine a state's web portal without much consideration for the broader technological abilities of the administration to increase the efficiency and effectiveness with which it can deliver promised services. However, the technological and administrative environment in which a government operates is possibly the most important factor in determining the ultimate success in planning and implementing online services. As discussed earlier, in the early 1990's, Pennsylvania's government was trying to operate on a technological and administrative platform characterized by outmoded technologies, which were poorly (or at best loosely) organized, and with a distributed, under-coordinated and under-resourced governance model. At the time, it was becoming quite clear to the Commonwealth's technical leadership that the existing technological and administrative platform was unable to support current operations, much less provide a springboard for new innovations, and that it lagged far behind many private sector firms and most other state governments.

During the Ridge administration, OIT entered into a series of important ICT projects that would attempt to address specific programmatic deficiencies that were identified by both the IMPACCT and the *Breaking Through Barriers* studies. The organization followed a clearly articulated set of objectives, or principles, as its members sought to facilitate the development of ICT systems throughout the Commonwealth. These six objectives were as follows: maximize the Commonwealth's ICT assets, effectively manage ICT investments, share and leverage resources, safeguard Commonwealth assets, improve public access to government information services, and strategic planning (OIT, 1998). OIT used these guidelines as they focused in on improving the Commonwealth's ICT infrastructure and moved toward developing advanced forms of Internet-based access to public services. Early in the Ridge administration, OIT would undertake an assessment and evaluation of the Commonwealth's ICT infrastructure, as well as tackle some of the less glamorous digital government projects, such as aggregation of disparate data centers, standardization of desktop software, and integration of criminal justice databases, that would eventually provide a foundation for the use of more advanced technologies. In essence, OIT made an overt decision to tackle the tough jobs up front. As Table 2 indicates, the administration would enter into a period of assessment and planning until approximately 1997 and then the Commonwealth's investment in ICT would dramatically increase during the rest of the decade.

Streamlining and Reassessing Current Digital Government Services

From 1996 through 2002, OIT began implementing a series of important ICT-focused projects for the Commonwealth. Most of these projects were clear examples of attempts to address the technological and administrative deficiencies that were identified by IMPACCT or “*Breaking through Barriers*.” These projects, described below and summarized in Appendix B, were the means by which OIT would leverage current ICT assets and more effectively manage ICT investments.

Case 1: Consolidating Datacenters with Data Powerhouse Project

One of OIT’s initial projects was to first consolidate, and then outsource to a vendor, the agency-run data centers that had been identified as sources of inefficiency and redundancy. The intent was to make better use of Commonwealth assets and to improve performance. As we noted, a major problem that early assessments highlighted was the lack of efficient management of agency data centers. At the time that the Ridge administration took office, the Commonwealth possessed 21 different data centers that were run independently for 17 different agencies. And, only one of the centers was more than eight miles from the capital of Harrisburg. These centers created numerous redundancies with regards to the costs associated with their management and maintenance and, furthermore, made it difficult to either share information across agencies or for the agencies themselves to promote more efficient management of their ICT resources.

The Data Powerhouse project was a major step towards integrating the management of ICT across the Commonwealth’s government with an eye toward cost savings and improved efficiency. After a competitive bidding process, a seven-year contract, valued at \$607 million, was awarded to a 10-company group led by Unisys (the group also included other large ICT companies such as IBM) in 1999. In doing so, the Commonwealth not only entered into a major effort to consolidate their data centers, but also was the first large state to outsource the management and maintenance of such centers. The consolidation of the older data centers into the new Bureau of Consolidated Computer Services was completed in October 2000 and had an operating budget of \$2.288 million during fiscal year 2001-2002. The estimated cost avoidance for the first five years of operation was estimated to be \$110 million and the new consolidated data center had a hardened facility with disaster recovery capabilities, a vast improvement over some of the older, less secure, locations (Data Powerhouse). For example, one data center had been prone to flooding whenever Harrisburg received heavy rain.

The consolidation of the data centers was proposed as a means for increasing effectiveness and, ultimately, saving money. An external evaluation of Pennsylvania’s ICT assets by Gartner in 2002 provides some insight into the early gains from the project. The Commonwealth did retain some costs associated with the project, (such as hardware, software, business resumption, occupancy, operations support, technical services support, and some finance and administrative support) at the time of the evaluation, since the project was just moving out of the consolidation phase. While these retained costs did weigh down the overall efficiency measures of the mainframe and midrange systems, all systems operated with greater efficiency than the average measure from the Gartner database. Overall, Gartner’s evaluation did highlight the need for improvement associated with retain costs, but also acknowledged that, overall, the project was rated “excellent” (Gartner Case Study, 2002).

The significance of the Data Powerhouse Project is hard to overestimate. First, since Pennsylvania was the first state of its size to implement such an outsourcing project, it indicates the Commonwealth's willingness to undertake significant change to remove technical and administrative redundancies. Second, it marked a drive to work toward greater efficiency and effectiveness, rather than upholding agency fiefdoms.

Case 2: Back-End Standardization with Commonwealth Connect

At the advent of the Ridge administration, agencies within the Commonwealth were supporting between 3000 and 3500 personal computers (PCs). By early 1998, this number had already grown to between 20,000 to 25,000 PCs. As was typical in the mid-1990s, individual agencies had control over the software that operated on their PC's. In 1997, the OIT began roundtable discussions with leading software companies to explore the value of standardizing all agencies to a single software package for handling office productivity and e-mail functions.

The use of standardized software statewide was intended to improved office productivity and reduced a wide range of cost factors. As a part of the Commonwealth Connect project, roundtable discussions were begun in August 1997 with several leading software companies to explore the possibility of standardizing all agencies under a single software desktop package. After meeting over a period of eight months with representatives from Corel, Microsoft, Netscape, and Lotus, and evaluating these software companies on a number of factors, Microsoft was selected in June 1998 on the basis of its vision for creatively using its software products to make Pennsylvania's state government a model for the public sector in the 21st century. One former OIT employee noted that the focus of the bid and evaluation was on the extent to which the vendor met the policy needs of the government, not necessarily their budget. The initial enterprise agreement included operating systems for 40,000 PCs, 15,000 office-suites, and back office software. By 2002, it was estimated that between 60,000 and 65,000 PCs were operating within the Commonwealth's government.

By standardizing with Microsoft desktop functions and e-mail, it became easier for state employees to exchange files and e-mails, and the time needed for software training was greatly reduced. As a result, it increased the overall efficiency and effectiveness within state agencies. The savings over the three-year life of the Enterprise Agreement with Microsoft was \$9.2 million, and state agencies have saved an additional \$9 million annually by lowering the Commonwealth's total cost of ownership for desktop software.

In addition to the savings related to the standardization initiative itself, the Commonwealth was able to obtain a commitment from Microsoft to invest \$11.9 million for economic development and educational projects in PA communities. Therefore, OIT was able to leverage its sizable purchasing and contracting power to gain additional value from the vendor in order to help important stakeholder groups.

The significance of this project is that it shows how the Commonwealth attempted to move toward a procurement system that truly met the policy objects of Pennsylvania rather than just picking the lowest bid. Furthermore, it also demonstrated the benefits of a collective attempt to leverage larger government-wide contracts to attain not only the desired good or service but also

a greater value for the Commonwealth. In this case, Microsoft's investment in economic development and education projects provided significant added value to the state.

Case 3: Improving Information Sharing with JNET

In addition to improving the management of Commonwealth ICT assets and effectively managing ICT investments, another key issue that OIT attempted to address was the sharing of information and resources among administrative agencies. Since many agencies had previously run ICT operations autonomously and with little regard to administrative goals that extended beyond the particular agency's specific functional jurisdiction, the sharing of important policy or program information was, at best, difficult. Initial assessment of the Commonwealth's ICT assets highlighted the need to break down these fiefdoms and improve the sharing of information across agencies in the hope of improving overall government policy and administration.

An exemplar of this effort to enhance information sharing is the joint effort undertaken to develop the Justice Network (JNET). The JNET was an attempt by the Commonwealth to facilitate the development of a new information system that would provide law enforcement and criminal justice agencies the ability to track criminal suspects and offenders as they progressed through Pennsylvania's criminal justice system. This example also demonstrates how OIT was able to facilitate the cooperation of agencies with a variety of jurisdictional considerations to achieve an information system that supported better administration, and ultimately increased public protection, within the Commonwealth.

The JNET was officially initiated in March 1996 with the establishment of the Leadership Committee for Integrated Justice (LCIJ), which included numerous members from the criminal justice community, that met to discuss the creation of a common telecommunications network for state and local police, as well as prison and probation officials. This example showcases in practice two principles of action that OIT used successfully across most of its projects. First, since the budgetary considerations of individual agencies might provide an additional barrier to stakeholder cooperation during the project, OIT was often asked to provide resources to support the effort and facilitate the discussions of ongoing budgetary issues (around ICT development, deployment and use) as the project progressed. In the case of JNET, OIT took on one half of the cost of development, partnering with Pennsylvania State Police (PSP) and OIT helped to ensure that the Governor's office expanded the PSP budget to support this effort. Second, JNET's development and deployment involved many agencies with different jurisdictions. In this context, OIT provided staff with expertise (to gather evidence and help develop the project's business case) that reduced the potential for discord and increased the likelihood for cooperation between the different stakeholders. Finally, OIT sought the support of senior administration officials in order to emphasize the importance of the project to its stakeholders. For example, during the early discussions of JNET, senior OIT staff arranged to have the Lieutenant Governor stop in on meetings to chat with various agency officials participating in the meeting. This political presence and support from senior officials helped in two ways. First, it provided legitimacy to OIT's role as facilitator. Second, it made clear to the participant's the political attention and priority placed on this effort.

Background to The Justice Network (JNET)

Crime within the Commonwealth had been a major theme during Tom Ridge's run for governor

and he had made crime the subject for a special session of the administration in 1995 (KPMG, 2001). Therefore, it is no surprise that a major focus within the Commonwealth's ICT transformation was a project that combined the goals of increasing the programmatic ability of law enforcement with improving ICT capabilities. The overall goal was to provide a variety of criminal justice agencies a common platform with which to share the changing criminal history files of criminal suspects and offenders (The Justice Network handout, OIT). In essence, JNET was to provide law enforcement agencies from a variety of jurisdictions the ability to know the current disposition of any suspect or offender within the Commonwealth's criminal justice system.

As an integrated criminal justice system, JNET was initially conceived to provide law enforcement agencies with access to interconnected data repositories from the Pennsylvania State Police, the Department of Corrections, the Board of Probation and Parole, the Department of Transportation, and the Administrative Office of Pennsylvania Courts. JNET itself was built using, what was in the late 1990s, a growing technological capability to employ browser technology and the WWW, while making use of existing Commonwealth networks, such as the State Police's Commonwealth Law Enforcement Assistance Network (CLEAN) and the Commonwealth's fiber optic data network. Therefore, while JNET was a new attempt to technologically allow for the sharing of criminal justice information from different databases, it was to some extent built on already existing systems. Furthermore, its development coincided with the development of WWW-based technologies. This provided the technological ability to conduct integrated searches across multiple databases, while at the same time providing a relatively simple browser-based interface that could itself be used on a variety of software platforms (KPMG, 2001; several of the JNET handouts). These technological characteristics made JNET a prime example of information integration within criminal justice.

Following its previously mentioned special session on crime in 1995, the Ridge administration received interest from several agencies regarding criminal justice ICT projects. In order to examine the potential for integrating such projects, the administration chose to fund a task force on criminal justice, the LCIJ, to examine such issues. As noted previously, one primary role for OIT was to establish funding for the JNET project outside of the participating agencies' budgets. By providing independent funding for JNET, OIT and the Governor's Office of Administration removed a major impediment for inter-agency cooperation for the project. By providing agencies with outside funding that was controlled by OIT, cooperation was ensured. In addition to funding, OIT also oversaw and managed implementation of the project. After it was determined that sufficient interest for the project existed, a consultant was hired (KPMG) to further develop the project.

Initial funding of approximately \$11 million was allocated in 1997 in order to fund development of the system and the creation of the JNET steering committee (Wells, 2002). Approximately \$8 million was allocated for JNET's first year of operation in 1998. The operational budget for the project increased steadily to \$14.4 million in fiscal year 2002-03 (JNET handout from OIT). By 2003, total investment in the project had reached approximately \$69 million and JNET's operations included the participation of numerous criminal justice agencies within local, state, and federal governments. Within Pennsylvania, participants included 17 state agencies, 22 counties, 150 municipalities (including Pittsburgh and Philadelphia), and 500 district justice

offices. Federal government users included the U.S. Marshals, the Pittsburgh office of the Federal Bureau of Investigation (FBI), the Philadelphia and Harrisburg offices of the U.S. Drug Enforcement Administration (DEA), the U.S. Secret Service, the Philadelphia office of the Alcohol Tobacco and Firearms (ATF), and the U.S. Postal Inspections.

Overall, JNET has strived to reduce overall costs associated with defendant/offender processing, as well as delays in managing criminal cases, and minimize the risk of releasing offenders who could pose a public threat. The project was such a success that, by 2000, it was receiving national attention. In that year, it was named one of the “50 Best Government IT Projects” by *Civic.com* magazine. It was also one of 13 national award winners selected by the Federation of Government Information Processing Councils (FGIPC).

Bringing ICT to the People By Developing Cutting-Edge E-Government

Projects such as Data Powerhouse, Commonwealth Connect, and Justice Net indicate a major investment on the part of the Ridge, and subsequently the Schweiker, administrations to develop the government’s ICT infrastructure. With regards to the activities of OIT, these projects and others reflect an overt attempt to improve the digital government capabilities of the Commonwealth’s administrative agencies, while addressing issues and problems highlighted in both the IMPACCT and *Breaking Through Barriers* reports. While providing an improved technological foundation for the Commonwealth, such projects also provide a means to learning the methods and skills needed to tackle e-government projects in general. As OIT began to successfully facilitate improvements with regards to the Commonwealth’s digital government activities, it also learned how to manage large-scale ICT projects and the numerous stakeholders they inevitably involve.

As previously mentioned, Pennsylvania’s government was one of the last to have a presence on the WWW. By October 1995, the Commonwealth did have a state homepage (www.state.pa.us) that provided basic information on all agencies that came under the direct authority of the Governor. Additional information was also provided about the Governor’s Office, the Department of Environmental Protection, and the results from the state lottery (OIT Guiding principles handout). This initial site was then expanded to over 40 agencies and other governmental groups, providing greater information to the public via the WWW. The homepage soon included links to other independent agencies, the state judiciary, the state legislature, higher education, and other governments (local, other states, and federal). By 1997, Pennsylvania’s homepage had received over 10 million visits from the public.

Case 4: Integrating Government Information and Services Online: The PA PowerPort

As the evolution of the WWW and Internet progressed, the technological ability to provide goods and services online became more obvious to larger segments of society. In the private sector, providing the ability for online transactions was becoming commonplace as more and more customers possessed the ability to go online. Governments also began to explore the potential for not only providing basic political and programmatic information to citizens, but also to adopt more sophisticated methods of offering online transactions for such things as paying taxes, buying licenses and vehicle registration. In 1998 and 1999, OIT began to develop a more expansive plan to bring the business of government to citizens and other stakeholders, through a more integrated state portal, that would assist users by providing information and services

organized according to users' functional preferences and interests, rather than by bureaucratic organization. The objective of developing a portal design, what would become PA PowerPort, was to develop an integrated WWW presence for the Commonwealth that would not only provide information, but also facilitate a multitude of citizens-government transactions.

In early 1998, OIT initiated a request for proposal (RFP) for the development of an integrated web portal for the Commonwealth. The outcome of this effort was to be a state-level web portal that would improve the ability of the Commonwealth's citizens and stakeholders to find important information and services. Initial design expectations were for a portal that would increase usability relative to the current PA homepage and be cost effective with a relatively robust set of features. In addition, the design of the portal should enable government programs to control their own information and content on the portal. As one informant described, the modular design of the portal was supposed to allow program managers to control their agency's information content on the site, rather than have the content controlled solely by webmasters or other ICT personnel. Furthermore, OIT sought to facilitate the inclusion of local and state actors. At the time the portal's design was taking place, less than 10% of the local governments in Pennsylvania had a presence on the WWW. The portal technology was intended to be portable to local governments and serve as a template for creating a web presence. Finally, OIT was searching for ways to eliminate costs to local government, in that they did not want stakeholders within the Commonwealth to have to pay for the same technology more than once.

[Insert Screenshot of PA PowerPort Here]

The RFP was met with interest from a variety of potential vendors such as Yahoo, Oracle, InfoSeek, and Microsoft. After a series of OIT-led evaluations of the proposals, Microsoft and Oracle were chosen as the final two potential vendors. Microsoft was eventually chosen as the project's vendor, partly because of its plan to subcontract a great deal of the project's software coding to a Pennsylvania company, Peripherals Plus Technologies (PPT). The involvement of PPT as a subcontractor meant that a vendor familiar with Pennsylvania would complete a great deal of the project. The initial development cost of the PA PowerPort was remarkably low, at only \$300,000, with most of the costs associated with the software coding conducted by PPT. Microsoft actually donated approximately \$100,000 worth of consulting fees as part of a no-fee contract (Elliot documents). The initial project development began in March 2000 and ended in late 2001. The initial test, or beta, version of the portal was launched in June 2000, with the official launch of the portal in October 2000. Enhancements, such as personalized services, were added by February 2001.

The PA PowerPort was governed by an executive committee with 12 representatives from state agencies and managed by a staff of two OIT employees for whom it was a part-time responsibility. The approach was to develop a set of guiding principles and a website architecture, and then allow participating agencies to add to the site. The PPT licensing approach was innovative in that each new licensee had access to all previously developed content and site structures. This meant that agencies that adopted the PPT standard got the tools necessary to put their information on the WWW in an efficient and effective manner.

The PA PowerPort provided a means for the public to have one-stop access to many government

services and acted as a gateway to both local governments and the federal government. Furthermore, the PA PowerPort was tremendously popular with the public and experienced significant number of visitors. By July 2001, there had been over three billion visits to the portal. In September of that year, it was judged second place in a national “Best of the Web” competition held by the *Center for Digital Government* and *Government Technology* magazine. The quality of the PA PowerPort was recognized as the third best website in the same competition the following year (OIT, Online Awards page).

Institutional Innovations in Developing and Managing E-Government

As illustrated through the previous examples, Pennsylvania began a large-scale attempt to harness ICT as a means to facilitate a more effective and efficient approach to conducting operations internal to government agencies, as well as delivering information and service to the public. These examples also help to showcase OIT’s strategic efforts to address a series of operations-oriented projects associated with improving the operation and governance of ICT internal to the Commonwealth’s administrative agencies. For example, it was only after progress had been achieved on several initial digital government projects that OIT then turned its attention to working toward building a first-rate e-government system. The projects discussed in this monograph also highlight several important institutional mechanisms that assisted in the development of a more effective ICT infrastructure within Pennsylvania. These mechanisms include support from senior officials, budgetary oversight, project funding, strategic planning, and procurement.

Leadership and Support from Senior-level Officials

Too often a truism, senior leadership is critical to the successful development and deployment of large-scale ICT systems. The level of commitment shown by the Ridge administration in tandem with Pennsylvania’s successful development of digital government and e-government systems demonstrates the degree to which support from senior elected officials was crucial to the full and proper implementation of OIT’s ICT projects.

During the time period studied (1995-2001), an interesting relationship existed between senior officials, such as Pennsylvania’s Governor or Lieutenant Governor who developed and championed specific institutional goals, and the administrative actors who sought to develop new ICT systems. As discussed earlier, ICT was seen by the administration as a means of achieving broader political goals, such as a stronger criminal justice system, more economic development, and a reduction of administrative impediments for the public. Since OIT was charged with developing ICT projects that were aligned with stated political goals, senior officials had vested interest in continuing to exhibit the support necessary to development new forms of ICT use within the Commonwealth’s government. In essence, the alignment between OIT’s technological goals and the administrative goals of senior officials seems to be a crucial element in the successful development and implementation of large-scale ICT projects.

Funding and Budget Oversight

The Technology Investment Program (TIP) came about when Pennsylvania, along with every other state, was faced with the Y2K problem. Initially, a pool of money was set aside to address the issue because state officials didn’t initially know what agencies would require what levels of funding to address the impending problem. This “Y2K” money was a separate appropriation

from the budget office, a line item in the budget that was part of the overall general fund.

Of the money that was put into the “Y2K” fund, Charlie Gerhards, former Director of the Commonwealth Technology center and then Deputy Secretary for Information Technology for Pennsylvania, would decide, based on assessment of need, how the money would be distributed. As a result, he had a great deal of discretion as to how the money would be spent, signifying a significant level of trust between OIT and the budget office. This trust was established via OIT’s strong accounting practices in regards to TIP funded projects.

By fiscal year 1998-1999, OIT was given the power to proactively review all agency budget requests for ICT projects. OIT used this informal power to guide agencies toward a more rational approach to ICT project planning. Agencies were required to submit a business case that outlined the goals and costs of ICT-related funds and OIT would make recommendations to the budget office as to whether the proposal should be funded. This informal power was based on the respect given to OIT by the budget office and it was crucial in OIT’s attempt to centralize governance of the Commonwealth’s ICT infrastructure.

The evidence suggests that TIP program was very successful. So much so that, after 2000 (and the efforts to ensure Y2K remediation were successful), the program was continued to provide support for other innovative technology projects, most notably because the 18-month budget cycle did not allow for quickly changing technological needs. As a result, the OIT could allocate funds to areas and agencies that it deemed having the greatest need for software, hardware, or development *at the time*, allowing the OIT to implement crucial e-government initiatives for the state of Pennsylvania in a timely fashion.

Developing Strategic Policies

In almost every case, an important step to initiating innovation is idea generation and the development of strategies to successfully address impediments to desired goals. With regards to Pennsylvania, OIT not only attempted to have governmental policy drive ICT development, but also sought the advice of several groups from within the Commonwealth’s government, the private sector, and higher education on potential future directions for innovation.

These groups served as a source for new ideas and as a way to anticipate possible future challenges. The *Corporate Advisory Council* was composed of 18 CIO’s from major corporations within Pennsylvania. This group met approximately four times a year for half-day sessions in order to discuss new ideas and issues regarding the use of ICT across the state. One informant highlighted the importance of private sector input by saying that OIT was not attempting to model the ICT operations of other state governments, but rather to model industry standards from the private sector.

As stated previously, in addition to input from private sector executives, OIT also sought input from the Commonwealth's government. The *IT Leadership Group* was composed of approximately twenty high-level administrators (Deputy Secretaries or the equivalent) from agencies under the jurisdiction of the Governor. This group met as a means to discuss issues surrounding ICT use within the operation of the administrative agencies. Similarly, the *University CIO Advisory Group* was composed of the CIO's from major higher education institutions within the Commonwealth. This group met for the purpose of discussing, not only the use of ICT for educational purposes, but also issues of technology standardization, procurement, and telecommunications (OA/OIT, Guiding Principles).

Revising Procurement Rules

When Governor Ridge came to office, he recognized that the existing Request-for-Proposals (RFP) process was tedious, time-consuming and fraught with legal difficulties. He realized that the implementation of a streamlined procurement process could improve government productivity, as well as save time and money. In his new initiative, an Invitation to Qualify (ITQ), a number of vendors were pre-qualified to provide services, allowing state agencies the option of selecting from this list of pre-approved companies to expedite their procurement needs.

The ITQ process was first piloted for the procurement of LAN services in 1996, and has since been used to procure many additional services, including IT consulting, computer training, computer programming, and computer systems analysis, to name just a few. Prior to the ITQ process, the RFP cycle could take up to 6 months or more to complete. Under the ITQ process, procurements have been completed in as little as three days. ITQ vendor lists are open for continuous enrollment and allow for the pre-qualification of an unlimited number of vendors.

Conclusions and Recommendations

Government, at best, is a complex institutional setting, leading some to wonder if it can truly be managed (Shalala, 1998). One of the reasons government adopts ICT is to use it as a catalyst for change. However, another reason ICT is adopted is to aid in managing within a complex institutional environment. Both are ICT-enabled changes: the former changes what work is to be done, the latter changes the way in which work is done. Too often, though, institutional inertia and complexity result in the manifestation of weak results or results that are completely unanticipated. The root question we address in this monograph is simply: How did Pennsylvania's focus on ICT and e-government lead to positive governmental change during this period?

As we noted previously, several actions helped, in part, to catalyze Pennsylvania's success with regards to digital government and e-government from 1995 through 2001. First, executive leadership advocated using ICT as a means to achieve the administration's goals. Second, by creating and then making OIT a central actor in ICT projects, funding, and in particular as the champion of ICT initiatives, the Ridge and Schweicker administrations altered existing organizational arrangements, raising the visibility of digital government and e-government activities. Third, the Pennsylvania executive leadership created institutional mechanisms that altered the ways that ICT projects, and particularly e-government projects, would be funded and administered.

When Governor Ridge and senior members his administration began speaking of ICT as a means for economic development, and that Pennsylvania's government needed to embrace the WWW to deliver services to its constituencies more directly, they raised citizens' perceptions and expectations. Moreover, this attention to the possible roles of ICT and e-government in everyday governmental activities must be set within the context of society's increased interest in, and attention to, the potential impacts of wide-spread, internet-based computing. The late 1990's were the time of the "dot.com" and the information-economy. Executives in both the public and private sector engaged in constant discussions about the emerging role for ICT in instituting change to enhance operational efficiency and effectiveness. Thus, public interest both allowed for, and encouraged, the Pennsylvania Commonwealth leadership to take on ICT and e-government.

When OIT, as a new unit within the administration, began to aggressively pursue ICT-infrastructure and e-government projects in the mid-1990s, they were able to show that the Governor and his administration were actively engaged in initiating ICT by providing both tactical support to ICT initiatives and drawing direct gubernatorial support. A key development was when OIT staff began conducting oversight on agency ICT budgets. The OIT staff also reshaped the Commonwealth's computing and telecommunications infrastructure, pursuing consolidation, standardization and commoditization. Building on this, programs such as TIP, the Microsoft site license and revised procurement processes (ITQ) efforts altered existing ICT practices such as the decision-making processes surrounding ICT and e-government projects, and reshaped expectations of how state government would serve its citizens.

Change Principles and Recommendations

Drawing from this case study and connecting its findings to existing literature, we conclude with two change principles and four recommendations for successfully engaging d-government and e-government activities. We further note that these may be applicable to other institutions, as they seek to adopt ICT to make substantial institutional change. By change principle we mean that these should be seen as conditions or expectations that must be accounted for in all plans and activities. By recommendations we mean that these actions are likely to increase the chances of successfully engaging ICT-enabled institutional change (and inversely their absence is likely to decrease the institution's chances for successfully engaging ICT-enabled change).

Change Principle #1: Large-scale ICT-based changes are institutional changes. This requires sustained and visible support from senior political leaders within the government. As with any administrative reform effort, the successful development, planning, and implementation of technologically-based reforms within large institutions require significant and sustained support from senior political leaders. Within the politicized environment of government administration, sustained support from elected leaders is necessary to deter or mitigate the possibility of agency-based intransigence with regards to adopting ICT-based strategic goals that may initially conflict with the goals of agency administrators. Without such sustained political support from elected political leaders, technological or managerial innovations associated with ICT-based reforms may whither against the institutional inertia to continue the administrative status quo.

Change Principle #2 Organizational activity and technological changes are both intimately linked together and path dependent.

That is, changes to either the governance, or the operating infrastructure, of ICT demands changes to both. In addition, past decisions will both frame and guide the options and decisions that the government will experience in the future. These changes are then integrated with the current operational environment and organizational practices. This point is reflected in the Pennsylvania case, in that the first four-year's of OIT's existence (including its creation in 1993) were focused on improving ICT governance, even as it modernized the scrambled technological infrastructure. In the latter part of the 1990's, OIT was then able to build on the technological platform it had put in place, and evolve and improve both the ICT services offered to government agencies and the citizens of Pennsylvania, as well as the governance of these services. This platform perspective suggests that coherent and managed technological change is mandatory (and its absence may underlie much of the problems with engaging centralized ICT administration and leadership in public sector organizations). Put simply, the Pennsylvania experience suggests that public sector uses of distributed computing platforms such as the internet, WWW, and desktop (or server-based) computing, requires a strong centralized ICT administration, one that has both budgetary and intellectual oversight.

Recommendation #1: Create new institutional ICT units to facilitate ICT-based change.

When faced with new socio-technical paradigms, such as the adoption of distributed computing and wide-area telecommunications networks that appeared in the mid-1990s, the creation of new administrative units may facilitate greater institutional change than the incremental alteration of existing units. This may be especially true if embracing the new technological paradigm requires significant alterations in the government's existing management practices concerning ICT, or if it requires significant departures from administrative norms. In essence, a need for more radical technological innovation within the broader institution may require a more radical move, with regards to institutional design, by creating a new administrative unit that embodies the norms, culture, and possibilities associated with the new technological paradigm.³

Recommendation #2: Develop institutional ICT governance structures that place government-wide ICT units in proximity to both political leaders and agency-based program leaders in order to promote coordination among administrative and technological goals.

The placement of a government-wide ICT unit, such as the CIO office, should be carefully placed within the broader administrative governance structures so that it may server as a nexus between high ranking elected officials and the heads of administrative agencies. While there is some debate with regards to whether or not a CIO office must be formally placed at the "cabinet" level or whether it might be placed within a larger unit, such as a Department of Administration, it must be able to closely monitor and garner high-level political support, while acting to coordinate and facilitate technological and administrative innovation within major administrative agencies. This will better enable it to translate the political themes of elected officials into sound

³ There was no unit with government-wide ICT oversight in Pennsylvania during the 1990s so there was no central administrative unit with a preexisting role in overseeing the government's ICT efforts. Some evidence from other states during the same period of time, such as New York and California, suggests that altering the roles of existing units did not lead to the same level of success as Pennsylvania experienced.

strategic plans and policies that consider the organizational realities of the administrative agencies. By considering both perspectives, there is a greater possibility for lasting positive technological and administrative change.

Recommendation #3: Government-wide ICT units must have formal or informal authority to actively oversee ICT investments and assist with the development and evaluation of ICT-based program goals.

In addition to the placement of the CIO office, the office's authority, perceived and real, plays an important role in its ability to both monitor and foster change. As with any institution, the authority to control key resources can be used to direct strategic change. In the case of Pennsylvania, the OIT had informal authority to oversee the ICT investments, through its cooperative relationship with the Commonwealth's budget office. This informal authority enabled OIT to review the proposed ICT budgets of agencies and, in effect, promote ICT investments that were inline with broader government-wide strategic plans. By making sure that ICT investments met stated government-wide goals, the OIT was able to steer the broader institutional change effort.

Recommendation #4: Draw on the expertise of leaders in other economic sectors or political jurisdictions to assist in strategic planning on using ICT to achieve future goals.

This principle suggests that those engaging large-scale ICT-enabled organizational change should not go-it-alone. Government leaders can leverage insight and expertise from other sectors such as: nonprofit (university, think tanks, interest groups, etc), private sector (companies, etc), as well as other state and federal government agencies. Drawing on existing knowledge and using knowledgeable external sources for advice and guidance helps provide information to key decision makers and possibly assists in the crafting better strategic policy; it can also assist in creating buy-in from stakeholders.

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Table 1: Pennsylvania Labor Force Characteristics: 1990

INDUSTRY	Persons >=16 years of	
	age	%
Agriculture, forestry, and fisheries	97,811	1.80
Mining	31,396	0.58
Construction	331,161	6.09
Manufacturing, nondurable goods	445,349	8.19
Manufacturing, durable goods	641,871	11.81
Transportation	241,749	4.45
Communications and other public utilities	134,992	2.48
Wholesale trade	234,880	4.32
Retail trade	931,987	17.15
Finance, insurance, and real estate	351,519	6.47
Business and repair services	236,825	4.36
Personal services	138,027	2.54
Entertainment and recreation services	56,928	1.05
Health services	539,555	9.93
Educational services	448,888	8.26
Other professional and related services	352,988	6.50
Public administration	218,606	4.02
(Total)	5,434,532	100.00

Note: Source U.S. Census Bureau, 1992.

Table 2: IT Investment in PA (Million \$)

1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02
20	19.9	17.5	38.5	49.7	54.8	136.5	170.2
Casey Admin.	Ridge Admin. Planning Phase		Ridge/Schweicker Admin. Implementation of IT Projects				

Source: Pennsylvania Governor's Office of Administration, 2001.

Table 3: Pennsylvania Keystone to E-Stone Timeline

1993

- Summer – Office of Information Technology established and Richard Walsh hired as first “CIO.”

1994

- November -- Tom Ridge (R) elected Governor of PA.
- December – Tom Pease is hired as Secretary of Administration.
- December -- Larry Olson is hired as IT director in Governor’s office (CIO).

1995

- Crime was made special topic of the First Special Session of the Ridge administration (beginnings of **JNET**).
- August – Larry Olson appoints Charles Gerhards as director of the Commonwealth Technology Center (CTC).
- October 19 – PA’s first homepage was introduced (48th state to do so).

1996

- **TIP** fund created sometime in late 90’s to fund Y2K programs.
- Funding made available for the Criminal Justice Affinity Group – **JNET**.
- Tom Hutton joins the governor’s office of general council in the Ridge Administration, begins work on e-commerce initiatives and revising PA’s procurement laws.
- **Invitation to Qualify (ITQ)** – first piloted with procurement of LAN.
- March – Leadership Committee for Integrated Justice formed to discuss **JNET**.
- Spring 1996 – IMPACCT report published.
- 1996 – Office for Information Technology established.
- November – **JNET** steering committee formed from the Criminal Justice Affinity Group to monitor the consulting firm’s work

- **Public Safety Radio Project Act** passed (23 participating agencies).

1997

- May - \$11 million designated to begin building **JNET**.
- July – **Data PowerHouse Project** announced.
- August – Round table discussions began to select a vendor to standardize agencies under governor for office desktop software and e-mail – **Commonwealth Connect**.

1998

- Atlas database introduced and goes online – **Technology Atlas**.
- June – Contract with Microsoft finalized for **Commonwealth Connect**.
- October – **JNET** becomes operational.

1999

- Early – OIT begins exploring options for extending capabilities of PA homepage – “**PA PowerPort**.”
- Early – Began processes to select vendors for ERP and systems integrators for **Imagine PA**.
- January - Charles Gerhards appointed as CIO by Tom Ridge to replace Larry Olson.
- August – Finalized contract with Unisys Corporation as vendor for **Data PowerHouse Project**.
- September – Contracts for **Public Safety Radio Project** finalized.
- October – **PA Open for Business** website is launched.

2000

- Early – Announcement of new telecom contract for **Keystone Communications Project** would be awarded to “PA Team:” a consortium of 16 companies led by Adelphia Business Solutions.
- Pilot project in Harrisburg begins testing for **Public Safety Radio Project**.
- May – Contract with Adelphia finalized for **Keystone Communications Project**.

- June - Beta version of **PA PowerPort** launched.
- June – Contract with SAP finalized for **Imagine PA** software vendor.
- Fall – Began transition to new telecom network (**Keystone Communications Project**).
- August – Continuous enrollment begins in **ITQ**.
- October – Full transition to **Data PowerHouse** complete.
- October – Contract with Microsoft finalized for the **PA PowerPort** project.
- October – Official launch of the **PA PowerPort** website.

2001

- Early - **Imagine PA** project team created.
- February – Enhancements and personalization added to **PA PowerPort**.
- March – Contract with KPMG Consulting (with IBM as partner) finalized as system integrator for **Imagine PA**.
- May –38 agencies (over 30,000 PC users) moved to **Commonwealth Connect** e-mail network.
- May- Construction of enhanced **PA Open for Business** website begins.
- June – Remaining agencies to be migrated to **Commonwealth Connect** central e-mail system.
- June 30 – All agencies’ PCs (40,000 total) standardized on **Commonwealth Connect** desktop software.
- September – Debut of enhanced **PA Open for Business** website.
- October - Mark Schweiker becomes governor of PA, replacing Tom Ridge, who was named the first Director of Homeland Security.
- December – Most services for **Keystone Communications Project** to be online.

2002

- **PA PowerPort** placed 3rd in Best of the Web.

- Charlie Gerhards named Public Official of the Year.
- June 24 - Migration of the **Public Safety Radio Project** begins.
- July – Beginning of implementation of **Imagine PA** software (SAP -- leading ERP).
- November – Ed Rendell (D) elected to be Governor of PA.
- End of year – The majority of all agencies’ PCs (60,000 total) standardized on **Commonwealth Connect** desktop software and e-mail network.
- December – Full statewide transition for **Keystone Communications Project**.

2003

- January – Ed Rendell becomes Governor of PA.
- January – Most of migration to mySAP to be complete for **Imagine PA** project. Soon after project renamed **EIS** (for Enterprise Integration System).
- March - Art Stephens appointed CIO, replacing Charles Gerhards
- End of year – Most state agencies are to be using the **Public Safety Radio Network**

2004

- April – Governor Rendell signs executive order providing OIT with formal oversight to all ICT projects and giving OIT partial responsibility to hire agency CIOs.
- End of year – SAP (ERP) software fully implemented for **Imagine PA** project.

PA PowerPort
www.state.pa.us

PA PowerSearch:

"Welcome to PA, home of the Friction-Free government."
Governor Tom Ridge 

Customize the PA PowerPort! Click here...

PA NAVIGATOR

[About PA](#)
[Business in PA](#)
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Ridge also talks electric competition with Toronto executives
Meets with CEOs from 13 Canadian companies that employ thousands in PA

6/27/2001
GOV. RIDGE TELLS CANADIAN WOMEN BUSINESS

PA WEATHER


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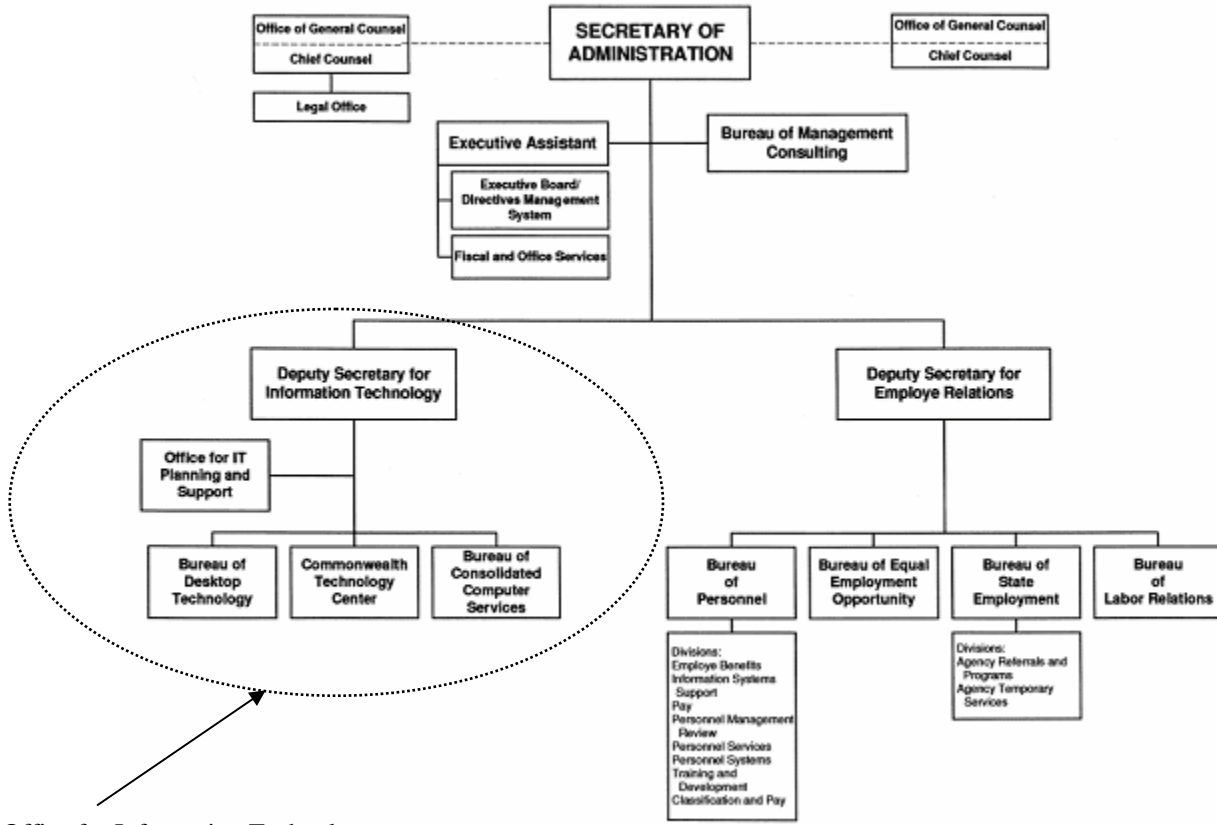
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LOTTERY RESULTS

Super 6	25,27,32,46,63,65	6/30
Cash 5	14, 15, 25, 30, 33	7/2
Big 4	3, 0, 6, 0	7/2

(PA PowerPort, 2001)

GOVERNOR'S OFFICE OF ADMINISTRATION



Office for Information Technology

Organization Chart for Governor's Office of Administration in 1998.
From Pennsylvania Bulletin, vol. 28, no. 1, January 3, 1998.

Appendix A: Research Approach, Data Collection and Analysis

After three years of preliminary research about e-government efforts on which to focus, including more than two years of negotiations with Pennsylvania stakeholders for access, we began interviews in early 2003. During this time we also collected several hundred relevant documents (from both state and personal archives), emails and publicly available reports, press releases, and news reports.

During our fieldwork we conducted more than 20 detailed interviews (conducted both face-to-face and over the telephone). Stakeholders both within the current and former administration's OIT (and senior management team) and stakeholders outside of both administrations participated (see Appendix C). We had unprecedented access to key players who were both (and we think rightly) proud of their efforts and very anxious for others to learn about the processes by which they brought Pennsylvania from being the 'keystone' state to becoming the 'e-stone' state (a term we, not they, used). In this paper we focus on the institutional frame in which ICT diffuse, highlighting structural change.

Our analysis reflects a two-pronged approach. We use historical, chronological, analyses to develop a time line of events and activities. We then explored the architectural and institutional ties of the events and activities. To do this analysis we first taped and transcribed all interviews (and when this was not possible, we relied on our detailed field notes). From the field notes, interview transcriptions, and archival records we identified evidence of institutional structure of computing using both interim analyses tied to iterations through the documents, notes and transcripts (e.g., Miles and Huberman, 1994). Through this iterative process we drew out the findings that we report on in this paper.

Appendix B: Summaries of Pennsylvania Digital Government and E-Government Efforts

Commonwealth Connect

In 1997, the state of PA began roundtable discussion with leading software companies to explore the value of standardizing all agencies under the Governor on a single software package for handling office productivity and e-mail functions. Microsoft was chosen to reshape PA state government and make it a model for the public sector in the 21st century. The use of standardized software statewide has improved office productivity and reduced a wide range of cost factors.

As a part of the Commonwealth Connect project, roundtable discussions were begun in August 1997 with several leading software companies to explore the possibility of standardizing all agencies under the Governor on a single software package for handling office productivity and e-mail functions. After meeting over a period of eight months with representatives from Corel, Microsoft, Netscape, and Lotus, and evaluating these software companies on a number of factors, Microsoft was selected in June 1998 on the basis of its vision for creatively using its software products to make Pennsylvania's state government a model of the public sector in the 21st century.

By standardizing with Microsoft for desktop functions and e-mail, it is easier for state employees to exchange files and e-mails, and the time needed for software training is greatly reduced. The savings over the three-year life of the Enterprise Agreement with Microsoft was \$9.2 million, and state agencies have saved an additional \$9 million annually by lowering the Commonwealth's total cost of ownership for desktop software. Microsoft's proposal also included a commitment to become a full Commonwealth partner, investing \$11.9 million for economic development and educational projects in PA communities.

ERP (Imagine PA)

For several years, the Governor's Office and the Office for Information Technology (OIT) have recognized the need for updates or replacement of their business information systems. Rather than implement a patchwork solution, the OIT decided to deploy a new, fully integrated business planning information system, using Enterprise Resource Planning (ERP) software. This project became known as Imagine PA.

My SAP was selected from a competitive procurement process as the provider of the ERP software. This project, which is still in the implementation process, will help to better manage the accounting, budgeting, personnel, payroll, and purchasing functions for state agencies, as well as provide an improved infrastructure from which to deliver e-government services to Pennsylvanians.

Invitation to Qualify (ITQ)

When Governor Tom Ridge came to office, he recognized that the Request-for-Proposals (RFP) process was tedious, time-consuming and fraught with legal difficulties. He realized that the implementation of a streamlined procurement process could improve government productivity as well as save time and money. This new initiative, Invitation to Qualify (ITQ), a number of vendors are pre-qualified to provide services and state agencies can select from this list of pre-approved companies to meet their procurement needs.

The ITQ process was first piloted on the procurement of LAN services in 1996, and has since been applied to the procurement of many services, including IT consulting, computer training, computer programming, and computer systems analysis to name a few. Prior to the ITQ process, the RFP cycle could take up to 6 months or more to complete. Under the ITQ process, procurements have been completed in as little as 3 days. ITQ vendor lists are open for continuous enrollment and allows for pre-qualification of an unlimited number of vendors

JNET

The Justice Network (JNET) was a project aimed at providing public safety agencies across PA with access to a common telecommunications network, or an integrated criminal justice system. JNET has provided agencies with access to interconnected data repositories from the PA State Police, the Department of Corrections, the Board of Probation and Parole, the Department of Transportation, and the Office of the PA Courts. Overall, JNET has strived to provide reduced costs associated with defendant/offender processing, reduced delays in managing criminal cases, and minimized risk of releasing offenders who could pose a public threat.

PA Open for Business

PA Open for Business is an electronic government (e-government) initiative launched by the Ridge administration in October 1999. PA Open for Business is a web site that provides entrepreneurs with state government forms they need to do business in PA. New business owners in the past had to contact multiple agencies to register their firms. Today, using PA Open for Business, they can simply go on the Internet and download the necessary information, making the process much easier and faster.

State-Wide Radio Project

When the Ridge administration came to office in PA, they immediately recognized the need to update an antiquated radio system that had limited communications between agencies and lead to excessive expenditures through duplicate equipment purchases. In 1996, the Governor launched the Public Safety Radio Project to modernize and unify state agencies' two-way radio systems. This more reliable communications between agencies has allowed workers with PennDOT, the State Police, and others to do their jobs better.

TIP Program

The Technology Investment Program came about when the state was faced with the Y2K problem. Initially, a pool of money was set aside because state officials didn't know what

agencies would require what levels of funding. This money was a separate appropriation from the budget office, a line item in the budget that was part of the overall general fund.

Of the money that was put into the fund, Charlie Gerhards, former Director of the Commonwealth Technology center, then CIO for the state of PA, would decide based on assessment of need how the money would be distributed, therefore he had a lot of flexibility on how to spend the money. This required a significant level of trust with the budget office, which was developed over the first couple of years of the TIP through good accounting of all expenditures.

After Y2K, the TIP was continued for other technology issues because the 18-month budget cycle doesn't allow for quickly changing technological needs. This allowed the Office for Information Technology (OIT) to allocate funds to areas and agencies that it deemed having the greatest need for software, hardware, or development at the time. This was a great deal of help to the OIT in implementing crucial e-government initiatives for the state of PA.

Appendix C: Key Informants

Kevin Dellicker

Kevin served as top technology policy advisor to the Governor during the Ridge Administration. Throughout those four years, he helped develop and implement the strategic technology vision for Pennsylvania. He was instrumental in eliminating taxes on high-tech businesses and creating tax-free zones for entrepreneurs and was personally responsible for creating and overseeing several technology initiatives. He developed many of the Governor's policy positions on the biotechnology and pharmaceutical industries. In addition to working for the Commonwealth, he has served as an Air Force Officer and is currently a senior associate for Affinity Group of Harrisburg.

Scott Elliott

Scott Elliott worked as press secretary for the Office of Administration under the Ridge and Schweiker administrations promoting the governors' technology initiatives. He is a native of Lebanon, PA and earned his master's degree in communications from the University of Washington. He worked for over ten years in the Pacific Northwest for commercial and public TV stations, and in corporate communications for companies including Boeing and Weyerhaeuser. He worked as a television producer around the world for clients such as Horizon Air, Aldus, and the Seattle Mariners and Seahawks.

Charlie Gerhards

Charlie joined the Tom Ridge Administration as director of the Central Management Information Center (CMIC) in August 1995, and later called the Commonwealth Technology Center (CTC). He became involved with many technology projects outside the scope of the CTC until January 1999 when he became the Chief Information Officer (CIO) of the Commonwealth of Pennsylvania. His main goal when appointed to the directorship of CMIC was to take the organization from worst to first, with the hard work and cooperation of the people in the organization. As the state's CIO, he oversaw the development and implementation of some of the most pioneering government technology projects in the nation, including Data PowerHouse, PA PowerPort, Imagine PA (SAP ERP effort), Public Safety Radio Project and JNET, to name a few. He remained CIO until January, 2003 when he founded Gerhards Consulting Group, LLC. He received his Bachelor's degree in accounting from Pennsylvania State University in 1970 and currently serves as an Advisory Board member for Penn State's College of Information Sciences and Technology (IST) as well as serving as a Senior Advisor for the Affinity Group of Harrisburg.

Nick Giordano

Nick led the formation and implementation of telecommunications policy for the Office for Information Technology during the Ridge administration. In early 2000, Nick was named as director of the Bureau of Commonwealth Telecommunications Services (BCTS). This agency was responsible for managing the Keystone Communications project that has helped to provide Pennsylvania communities with improved access to high-tech communications. His assignments included working with the PA Public Utility Commission, Universal Telephone Service Task Force, and the Governor's Link to Learn initiative. He has over 36 years of professional experience in the field of information technology. He began in 1966 as a computer programmer and has extensive experience in the development and management of computer and communications systems for state government. He currently serves as a senior advisor for the Affinity Group of Harrisburg.

Rhett Hintze

Rhett worked as Senior Policy Manager for Technology and Economic Development in the Governor's Policy Office and in the Office for Information Technology in which he served as Executive Assistant to the CIO. He left in January 2001 and now serves as the founding member and a senior associate for Affinity Group of Harrisburg. His principle activities at the Commonwealth included enterprise

technology policy development, multi-agency initiative oversight, and e-government strategy development and implementation. Prior to working for the Commonwealth, he spent time working in city, county, and national government offices after earning his Bachelor's in business/finance from Brigham Young University in 1995 and his M.P.A. from Syracuse University in 1996.

Tom Hutton

Tom was born and raised in Philadelphia, attended college at Notre Dame, and went to law school at Dickinson. After working for over four years with a law firm, he got the opportunity in 1996 to join the Governor's Office of General Council doing legislative work. He held that position until September 2000 when he began work with Independence Blue Cross where he remains today. During his term with the Ridge administration, he working on legislative issues and regulatory issues related to e-commerce, most importantly Pennsylvania's procurement laws and statutes, including the issues of electronic and digital signatures.

Tom Pease

While he was a lawyer in Harrisburg, Tom Pease turned to the health care industry where he raised enough venture capital to begin a chain of rehabilitation hospitals, which after a few years was sold to a fortune 500 company in Philadelphia. He remained as general counsel to that company for a year and a half, then decided to look elsewhere for a new challenge. Being in Harrisburg for years, he had an interest in government and when Tom Ridge won the primary, he thought it would be interesting to work for his administration. After Tom Ridge won the general election, he ran the transition for the Department of Welfare, Department of Health, Office of Administration, and Department of Education. Finally he was appointed as Secretary of Administration in early 1995 and remained in that position until December 2000.

Rita Reynolds

Rita Reynolds is currently serving as Information Technology Director of the Pennsylvania County Commissioners Association (CCAP). Prior to this position, she spent ten years working as consultant with the County and Children Youth agencies on control of computer design support, followed by a two-year position as Assistant Director of the County Commissioner's affiliate of Children and Youth where she focused on fiscal and computer issues. As director of CCAP she has worked on the infrastructure of the agency, and more recently interacted with the county IT directors discussing individual county IT needs.

Arthur Stephens

Art was appointed Deputy Secretary for Information Technology (CIO) on March 3, 2003. Prior to this position, he worked with Deloitte Consulting beginning in 1997 as a senior manager and principal where he worked in the public sector information technology practice and was responsible for all aspects of the business: sales, project delivery, human resources, public relations. He also worked for ten years with Andersen Consulting (now Accenture) with revenue and insurance systems, including projects for the PA Department of Revenue as well as many other states. He was raised in Pennsylvania and earned a Bachelor's degree from Pennsylvania State University.

George White

George entered the PA Commonwealth government in 1982 and served 12 years as a management consultant to state agencies. He has a bachelor's degree in Political Science and MPA (Finance orientation). His finance background helped him do a variety of IT investment/ assessments in his work as an internal management consultant. George moved to OIT to work with Larry Olson. In OIT he was a project sponsor and leader on the web portal, TIP fund and ITQ, among others. Following his time in OIT George also worked for Accenture, helping them develop Michigan's award-winning e-government/

web portal. George is now a vice-president with IntelliMark – an IT consulting firm with offices in Mechanicsburg, PA.

About the Authors

Charles C. Hinnant is a Senior Research Associate affiliated with the Center for Technology and Information Policy, the Maxwell School of Citizenship and Public Affairs at Syracuse University. From 2005 to 2007, he is serving as an Academic Fellow with the Information Technology Team at the U.S. Government Accountability Office in Washington, D.C. He previously taught in School of Public and International Affairs at the University of Georgia. His research primarily focuses on social and organizational informatics, digital government, information management and policy, public management, social science research methods, and applied statistics. His work focuses on developing a better understanding of the interaction between social and technical systems within public organizations. He is particularly interested in how public organizations employ Information and Communication Technology (ICT) to alter organizational processes and structures and how the use of ICT ultimately impacts institutional governance mechanisms. He is a frequent participant at academic conferences such as those held by the American Political Science Association, Association of Public Policy Analysis and Management, and Hawaii International Conference on System Sciences. In 2002, he received the Herbert Kaufman Award for the best public administration paper presented at the previous year's meeting of the American Political Science Association. His research has appeared in such journals as *Administration and Society*, *Journal of Public Administration Research and Theory*, and *IEEE Transactions on Engineering Management*. A native of North Carolina, he earned his B.S. and M.P.A. at North Carolina State University and his Ph.D. in Public Administration from the Maxwell School at Syracuse University.

Steve Sawyer is an Associate Professor and founding member of the School of Information Sciences and Technology at the Pennsylvania State University. He also holds affiliate faculty appointments in the Department of Management and Organizations of the Smeal College of Business, the Department of Labor Studies and Industrial Relations, and the Science Technology and Society Program at Penn State and holds a visiting faculty position at the School of Information Studies at Syracuse University. Steve conducts social informatics research, with a particular focus on the ways in which people work together and use information and communication technologies. He is currently interested in investigating how the production processes and methods of software development can be improved through attending to the ways in which developers interact with one another; studying how people adapt to working with large-scale information systems implementations (such as enterprise integration systems); and exploring the changes to both organizational work and larger-scale social arrangements due to the increased distribution of computing (via mobile and wireless technologies). His research has been supported by Corning, IBM, Sonoco, Xerox, the Lattanze Foundation, Lockheed Martin, Lucent Technologies, the Commonwealth of Pennsylvania, the National Center for Real Estate Research, and the National Science Foundation. Steve has published more than 60 works, including papers in a range of journals such as *Communications of the ACM*, *European Journal of Information Systems*, *Information Technology & People*, *The IBM Systems Journal*, *The Information Society*, *The Information Systems Journal* and *Computer Personnel*. With co-authors Rob Kling and Howard Rosenbaum, his first book, *Social Informatics*, was published in 2005. Sawyer is an associate editor at *The Information Society* and is on the editorial boards of *Advanced Media and Communication*, *Information Technology & People* and the *Journal of Information Technology*. Sawyer earned his Doctorate in Business Administration from Boston University.