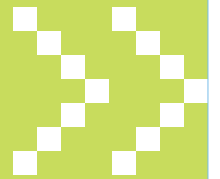




Center for
Technology in Government

Advancing
Digital Government Research



06 ANNUAL REPORT

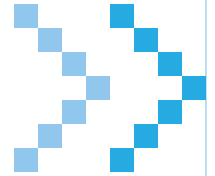
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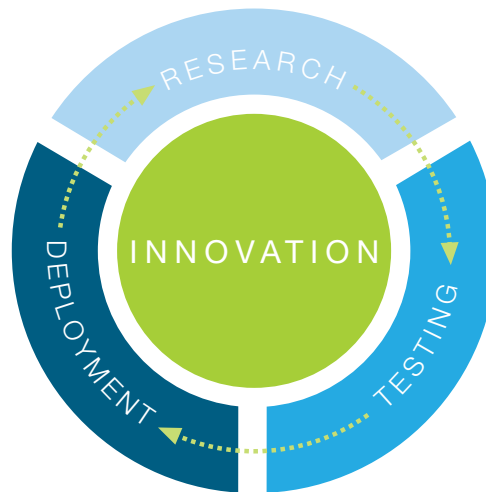


MISSION

The **Center** for Technology in Government works with government to develop well-informed information **strategies** that foster **innovation** and enhance the quality and coordination of public services. We carry out this mission through applied **research** and **partnership** projects that address the policy, management, and technology dimensions of information use in the public sector.



Advancing Digital Government Research



Since the early days of the Center for Technology in Government (CTG), the field of digital government (DG) research has come into its own, drawing research funding from the National Science Foundation and elsewhere and yielding information technology and social science research results ripe for integration into real government programs. CTG has been on the forefront to establish DG research as a new field that involves the cycle of innovation from research, to testing, to deployment, and back.

What distinguishes digital government research from research in its underlying disciplines is that those who practice it do so in active partnerships with government agencies. Further, DG research, like CTG itself, often involves close collaboration between the social and information sciences to examine interactions between technical and social processes in the context of governmental missions, organizations, and practices.

The five articles in our annual report this year exemplify the range of perspectives, theories, and approaches in digital

government research and are drawn from our own diverse projects. They provide a frame of reference for learning more about interdisciplinary research aimed at producing successful information-intensive innovation within government.

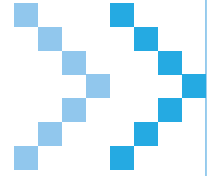
The topics cover significant issues facing government leaders and the DG research community such as: collaboration and information sharing; preservation of “born” digital government information; understanding the public value of IT investments; looking to the future of e-government technologies; and engaging the emerging field of international digital government research.

We thank the many government professionals, corporate partners, and academic researchers who have contributed to our work on these issues. As we work on all levels of government in the US and expand our work internationally, we will continue to share our results in ways we hope will benefit those who face the challenges, risks, and unknowns of investments in information-driven innovation every day.

Digital Government is the use of information and technology to support and improve public policies and government operations, engage citizens, and provide comprehensive and timely government services. As a result, digital government projects can, and do, involve a very broad range of computer and information technology as well as policy, legal, societal, and organizational factors.

Digital government research involves the application of computer, information, and social science methods to investigate the information-related needs, management challenges, and policies of government, as well as the information-related characteristics of a democratic society.

Collaboration and Information Sharing:



TWO CRITICAL CAPABILITIES FOR GOVERNMENT



Information is one of the most valuable resources of government. Government managers, however, are finding that the information needed to plan, make decisions, and act is often held outside their own organizations, collected for widely different purposes, and maintained in disparate formats. As a consequence, governments around the world are increasingly turning to information sharing as a strategy for maximizing the value of information in providing services and responding to problems. New practices are emerging at all levels; from town governments creating performance-based management capability by sharing information between departments such as police and highway, to state-level efforts to coordinate public safety practices, to national efforts responding to public health crises.

Information sharing allows government managers to work at the same time, with the same information integrated from multiple disparate sources. It has the potential to support the transformation of organizational structures and communication channels among multiple agencies working in different locations. These integration processes often involve new work processes and significant organizational change. They are also embedded in larger political and institutional environments that shape their goals and circumscribe their choices.

Examinations of the World Trade Center attack and Hurricane Katrina responses provide compelling arguments for making changes to create capability for sustainable information sharing programs. Both events highlight the value and difficulty of sharing knowledge and information among individuals,



professions, organizations, and governments in times of crisis. These events underscore the need for robust and resilient government response capabilities and provide a mandate for significant changes to ensure that cross-boundary information sharing is not only possible, but useful.

Public health and safety professionals, in particular, appreciate the need for this capability both in times of crisis and under normal circumstances. The US Department of Justice (DOJ) has long been a leader in encouraging and supporting cross-boundary collaboration and information sharing in the formation of enterprisewide criminal justice information integration between and among federal, state, and local justice agencies. Information sharing, according to Domingo Herraiz, director of the Bureau of Justice Assistance in the DOJ's Office of Justice Programs, is the "cross-cutting prevention piece" that will allow communities to reduce crime and fight terrorism.

Events such as the 2002 emergence of the West Nile Virus (WNV) in the US and its spread across the country since then,

TRUST AND CROSS-BOUNDARY INFORMATION SHARING

Trust building is an important social process for developing cross-boundary information sharing among organizations and individuals. The level of trust among participating organizations is particularly relevant to information sharing efforts because it can alleviate conflicts and ease the way for collaboration in the form of risk taking, knowledge sharing, and decision making. A high level of trust can contribute to full participation in the project and knowledge sharing about complex business processes and practices. The combination, and more importantly, the interaction of leadership, organizational culture, and formal structures to support knowledge sharing and cooperation over time can ease the way for trust development.

KNOWLEDGE AND INFORMATION-SHARING NETWORKS

Knowledge and information-sharing networks are emerging in an increasing number of government programs and policy arenas. These interorganizational and intergovernmental networks facilitate cross-program and cross-functional coordination and support communities of practice. They often include shared repositories of detailed program or administrative information, accessible to all participants, that can address such needs as program evaluation, reference services, or technical assistance.

Findings from CTG's research show that formal authority, perceived authority, and a variety of leadership behaviors appear to have important influence on the development and performance of public sector knowledge networks. These factors also affect the ability of such a network to achieve its substantive goals and the degree to which the effort provides satisfying and useful networking relationships among the participating organizations and individuals.



have shown that gathering, handling, and sharing information in response to a public health crisis, requires not only adequate technical capabilities for sharing information across organizational boundaries and among multiple levels of government, but reliance on strong interorganizational collaboration

skills. The WNV response required collaboration and information sharing among animal and human public health professionals, as well as healthcare facilities that spanned state, local, and federal jurisdictions, all of whom were unaccustomed to working together across traditional organizational boundaries. Together they faced challenges such as data and technical incompatibility, the lack of institutional incentives to collaborate, and power struggles around multi-organizational settings in government.

Understanding the factors influencing information sharing and collaboration in solving pressing public problems is a focus of attention for digital government practitioners and researchers alike. Ongoing research at CTG is exploring many of these factors and providing both new guidance for practitioners and new models of understanding for researchers. For example, trust building has been identified as an important social process for developing cross-boundary information

sharing among organizations and individuals. Given the critical role trust plays in fostering collaboration and allowing the development of enterprisewide integrated information resources, practitioners planning new cross-boundary information sharing initiatives must explicitly include resources for trust building among information sharing partners. Leadership characteristics and authority strategies are also significant in creating and sustaining collaborative efforts across organizational boundaries. New guidance built on this research provides practical advice to leaders on how to create information sharing capability in government.

Future work at CTG will continue to focus on cross-boundary collaboration and information sharing efforts through a National Science Foundation grant supporting the use of a national survey to test a new model of cross-boundary information integration. In addition, CTG is partnering with others through a new grant to create a North American Digital Government Working Group focused on cross boundary information sharing and collaboration. Both of these efforts provide CTG and our partners opportunities to explore the key questions about maximizing the value of information assets held by government and to contribute to theoretical discussions about information sharing and collaboration as important social phenomena.

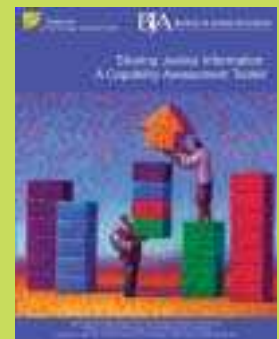
Theresa Pardo, Deputy Director, Center for Technology in Government

SHARING JUSTICE INFORMATION: A CAPABILITY ASSESSMENT TOOLKIT

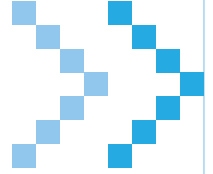
The justice enterprise faces many performance challenges that can be addressed more successfully through better information-sharing initiatives. These challenges differ widely in their scope and complexity. Regardless of their size, all these initiatives are made less difficult when participating organizations have high levels of information-sharing capability. Therefore, decisions to invest in information sharing initiatives must be grounded in a full understanding of the ability of those involved to identify and fill the gaps between current and required capability.

This toolkit is designed for justice professionals to use when considering or planning for a justice information-sharing initiative. It provides a process for assessing where capability for information sharing exists and where it must be developed in order to achieve public safety goals. Assessment results provide a basis for action planning to fill capability gaps both within and across organizations.

This is a self-assessment tool, based on the idea that the persons involved in an information-sharing initiative are best equipped, by their knowledge and experience, to make judgments and supply evidence about these capabilities. The toolkit was designed to facilitate discussion within individual organizations as well as across organizations involved in an information-sharing initiative. Download a copy at www.ctg.albany.edu.



Advancing a Public Value Framework for Government IT Investments



Every investment decision requires a leap of faith—sometimes a large one—into an uncertain future. However, after decades of investments in information technology (IT), running into billions of dollars, governments worldwide are largely unable to convincingly demonstrate a return on investment (ROI) that is widely understood or based upon well-grounded measures. While most can agree that government has been dramatically changed by IT, and many programs and services are more

effective and less expensive as a result, government agencies are finding it increasingly difficult to communicate the public benefits of these investments.

For past investments in government information technology, the article of faith seemed to be, “*If some is good, more will be better.*” Those days, however, are rapidly coming to a close. Instead, those currently holding the government purse strings have a much more critical and skeptical perspective that, “*If we scrutinize IT investments more closely, we will get better returns.*”

This view is becoming more apparent, as evidenced in the July, 2006 report of the US Senate Appropriations Committee, which recommended **zero** funding for the administration's 2007 e-government initiatives. The report says, "... the committee has no confidence that the amounts being assessed have any relationship to the benefits anticipated to be returned."

Similarly, the current appropriations bill in the US House of Representatives requires a cost-benefit analysis of all e-government initiatives. In describing the bill, Mike Hettinger, staff director at the House Government Reform Committee's Government Management, Finance and Accountability Subcommittee said in a *Federal Computer Week* article, "the language speaks for itself and reiterates what the subcommittee has been saying for the past year, that in order for this initiative to be successful, we need to have a better understanding of the costs and benefits and clearer guidance for the agencies to follow."

It will require more than a leap of faith to meet these requirements and justify even greater investments.

And the size of investment is already substantial. The US federal budget for fiscal year (FY) 2007 provides \$64 billion in funding for IT investments, approximately a three percent increase from the 2006 enacted level of \$62 billion. Total state and local government IT spending was about \$55 billion in FY 2004 and is expected to grow to over \$62 billion by FY 2009. Although what is included in the IT category may vary across these examples, the overall scale is quite large.

With this change in attitude, there is greater need for critical review and assessment. The low-hanging fruit available from early IT investments, such as establishing a Web presence and automating simple service transactions, has been largely harvested. More substantial improvements in government today typically involve exploiting the integrative and transformative potential of IT, but these projects require much larger investments.

These projects also require a way of assessing public value that matches their greater scope and complexity, and better mechanisms to build needed public support and guide development. The problem in doing so is not with the desire to better scrutinize these investments, but with the capability to do so. The principal part of that problem is on the value side of the question: namely, how to extend the concept of ROI beyond the usual cost savings and program evaluation methods. Public benefit, after all, is the basic purpose of government; thus the value of a government IT investment ultimately depends on how it fulfills that purpose.

Connecting a particular IT investment to some observable public benefit, however, turns out to be quite difficult. This is



partly a result of the inherent risk and complexity of government IT projects. Moreover, government IT investments, often specifically aimed at public value returns, such as increased security or transparency, are very challenging to define and even harder to measure.

This difficulty is evident in IT investments both in the United States and internationally. In 1999, the Israeli government undertook to restructure the financial, logistic, and human resource components of governmentwide administration into an integrated Enterprise Resource Planning (ERP) system, in a project called Merkava. It became apparent to those involved that they needed to think much more broadly about the goals of this project. According to Nir Gilad, former accountant general of Israel, they asked themselves, "Who is our customer? The first one that we defined is ourselves. We are serving ourselves to maintain our capability to run the systems that we are in charge of. But very quickly we came to the decision that it's ridiculous that we are building systems that are serving ourselves." They realized the value must accrue ultimately to the external customer, the public. This value is not, however, fully measurable in terms of financial results. The full value of government IT investments can be found by looking for both the internal value to government operations, plus the broader political and social returns to the public at large.

To do so, however, first requires a change in perspective, namely to consider the value question from the point of view of the public rather than from inside the government. From this point of view we can see two sources of public returns:

- (1) value that results from improving the government itself as an asset to the society, and
- (2) value that results from delivering specific benefits directly to persons or groups.

Value creation can therefore come as much from increasing the integrity and transparency of government as from reducing costs through activities such as online tax processing, license application and renewals, obtaining information, filing forms, etc. The public value propositions for these investments go beyond the important but obvious cost and time savings to include attention to service quality, access, and equity, to name a few. This take on value also includes many stakeholders, each with special interests and expectations from government; many kinds of public interests require an expansive way to view public value.

CTG developed a public value framework to give government IT executives and analysts an assessment tool in which this point of view of the public, not the government, is the basis. The main goal was to produce an assessment of public returns that is credible, persuasive, and highly relevant to the investment decisions faced by the government. The framework shows how to take into account how public value can change across the many interests of citizens and groups in interacting with governments.

Service New Brunswick (SNB), located in New Brunswick, Canada, is well-known internationally for its expertise in providing multi-channel “single window” citizen access to government services, as well as for developing and maintaining geographic information databases. In the case of SNB, Web access to company registrations provided direct value to citizens or stakeholders such as accountants, lawyers, financial institutions, and the general public searching for such business information. According to Darrel Fowler, director, project delivery for SNB, “Without the concept of ‘public value’ as a return on investment, it would be very difficult to gauge how much benefit a decision to invest in an IT initiative can have.”

In addition, the decision by a leading IT services company, CGI Group Inc., to locate its global e-government headquarters in Fredericton, New Brunswick, due in large part to its strong partnership with Service New Brunswick, benefits the economic



development of the city of Fredericton and surrounding areas in the province. This is a very powerful demonstration of the broader public value of SNB’s investment well beyond the direct benefits to citizen and government users of the system.

The desire for a more comprehensive and robust justification for new IT investments reflects their greater complexity and ambition. Conventional ROI analysis is simply inadequate to meet elected officials’ demands for greater scrutiny. Therefore, using such an expanded scope of assessment, even though more expensive, is both critical and necessary. The new knowledge about public value made available by using such a broad framework can meet both political and citizen demands. In addition, it can help guide other forms of investment, both IT and non-IT, and provide a basis for analyzing how multiple investments can work together and contribute to a more fundamental improvement in government.

Anthony M. Cresswell, Deputy Director, Center for Technology in Government

PUBLIC VALUE FRAMEWORK

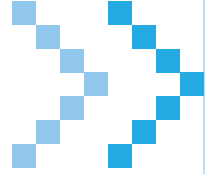
CTG developed a public value framework as a systematic way to identify and assess as wide a range of public value as possible. There are six main types of public value in the framework:

- **Financial**—impacts on income, asset values, liabilities, entitlements, or risks to these factors.
- **Political**—impacts on the ability to influence government actions or policy, or prospects for current or future influence or office.
- **Social**—impacts on family or community relationships, social mobility, status, or identity.
- **Strategic**—impacts on economic or political advantage or opportunities, goals, resources for innovation or planning.
- **Ideological**—impacts on beliefs, moral or ethical commitments, alignment of government actions or policies, social outcomes, or moral and ethical positions.
- **Stewardship**—impacts on the public’s view of government officials as faithful stewards or guardians of the government itself in terms of public trust, integrity, and legitimacy.

Each kind of value can result from one or more of the value-generating mechanisms in government operations associated with new IT:

- **Increases in efficiency**—obtaining improved results with the same resources, or the same results with fewer resources, such as paying taxes online.
- **Increases in effectiveness**—increasing the quality and/or quantity of the results, such as improved health care through electronic medical records.
- **Enablement**—providing means for valuable activities or preventing undesirable ones, such as providing genealogists access to birth records for family history research.
- **Intrinsic enhancements**—outcomes for a stakeholder that are valued for their own sake, like greater government transparency or to reduce injustices.

Managing and Preserving State Government Digital Information



Information and records custodians such as state archives, records management agencies, and libraries have traditionally provided long-term public access to significant government information in paper and other traditional formats. More and more, however, this information is being created solely in digital form. Much of it has only short-term value, but a considerable fraction must remain available for many years, or in some cases, permanently. Digital information with long-term cultural and historical value can include anything from California's official state budget, which is now issued exclusively in digital form, to digital recordings of legislative sessions, to the electronic correspondence of key government officials.

All signs point to continued growth in the volume and complexity of "born digital" government information. However, most states are hampered in their efforts to respond to this growth by a combination of technology, policy, political, and management issues, complicated by fragmented organizational roles and responsibilities for managing and preserving digital information.

While traditional information and records custodians agree that not all digital information produced by government is worth saving, all agree that a small portion of this material is of permanent legal, legislative, or cultural value. In addition, a much larger portion has short and medium term value to CIOs, state and local agencies, the private sector, and citizens for purposes of e-government, e-commerce, and day-to-day government administration.

To address these challenges, traditional information and records custodians and other key stakeholders, such as chief information officers (CIOs), need to reorient strategies toward sharing information and assets and understanding commonalities rather than emphasizing differences. It is time to move beyond debates over terminology and start treating digital information as a "public asset" with multiple values to both government and society.

An important first step in developing effective strategies is to understand the existing technology, policy, and management

contexts that make managing and preserving state government digital information such an important yet challenging issue.

TECHNOLOGY

Technology has had profound impacts on the creation, access, storage, and preservation of government digital information. According to a US Library of Congress report, "the record of government information is jeopardized by the transformation that digital technology is forging. This new technology has spawned a tremendous amount of information that is extremely fragile, inherently impermanent, and difficult to assess for long-term value."

For example, in Arizona, information and records custodians highlight the challenges of managing and preserving legislative proceedings, which are now captured using digital video without transcription. According to representatives from the Arizona State Library, Archives and Public Records, "There is no inherently stable video format to which we can transfer this information for preservation." In addition, working with this format requires specialized technical skills and equipment. Unlike a paper, or even an electronic document, "it cannot be key-word searched, nor can it be easily skimmed" to assess its value for preservation.

POLICY

In most states, policy authority for archiving government digital information is dispersed across traditional information and records custodians, CIOs, operating agencies, and even branches of government. This authority can take the form of legislation, standards, operating guidelines, and even specialized services. This array of policy instruments has contributed to the increasing fragmentation of responsibilities for managing state government digital information.

In a 2006 Center for Technology in Government (CTG) survey, supported by the Library of Congress, state archivists, records managers, and librarians from all 50 states and several territories indicated that authority for setting standards for

THE VALUE OF DIGITAL INFORMATION MANAGEMENT AND PRESERVATION

State strategies to communicate the value of digital information management and preservation include:

- The ability to clearly identify and manage digital government information of value supports government business continuity and disaster recovery planning efforts.
- Making digital information available for use and reuse supports e-government and e-commerce transactions.
- Accessibility and availability of government records and documents can increase public trust in government.
- More efficient storing, managing, researching, and retrieving of digital information can result in cost savings at the local government level.



US Library of Congress

CTG worked with the US Library of Congress to help states and territories develop strategies for preserving significant state and local government information in digital form.

creation and maintenance of digital information resides primarily outside of traditional information and records agencies. Instead, information technology organizations, in particular, stand out across all three branches of government as holding a significant role in the standards-setting process and in providing services related to the management of digital information.

One example comes from Georgia. The Georgia Technology Authority (GTA), headed by the state's CIO, has authority over many data management standards for government digital information. As a result, the state archives has made it a priority to work cooperatively with GTA on standards development. The archives and GTA collaborated on the state's *Design Criteria Standard for Records Management Applications*. This policy, which reflects both IT and records management expertise, defines the standards state agencies must use when purchasing records management applications.

MANAGEMENT

The combination of technology and policy has a significant impact on the management context when it comes to government digital information. For example, government agencies in many states are deciding to maintain digital information for the long-term within their own agencies, rather than in a specialized records center or archive. These agencies and their IT staff are questioning the need to send government digital records

to the state archives and libraries due to their own "archiving" capabilities.

In Louisiana, one state records manager noted that some state agencies have resisted efforts to create a state-level digital repository. This resistance is due, in large part, to the combination of perceived needs to keep some digital information "in-house" and in perpetuity and their IT departments' claims that they have the capability to meet these "archiving" needs. Unfortunately, these differing perspectives on how to manage and preserve digital information result in organizations overlooking opportunities to work together and develop collaborative strategies that support multiple interests.

DIGITAL PRESERVATION STRATEGIES

By treating digital information as material of permanent value to be archived and protected and as an asset that derives its value from frequent use and reuse, traditional information and records custodians can identify and take advantage of shared opportunities and overcome significant technology, policy, and management challenges. These shared opportunities include building successful partnerships and integrated strategies with CIOs, agency information creators, and IT staff to manage and preserve valuable digital information. Traditional information and records custodians in several states have already had success with this strategy, such as Washington State, Georgia, and New Jersey.

Success depends on the ability of traditional information and records custodians to collaborate with key stakeholders across the government. They can do so by leveraging successful models and best practices to form effective cross-boundary partnerships built on a foundation of treating digital information as a shared and valuable public asset.

CTG's efforts in this area have focused on helping states identify and understand these challenges and begin identifying strategies to overcome them. Despite the obstacles, states are "learning by doing" and developing the necessary partnerships and capabilities; in large part due to their abilities to communicate the value of digital information as a shared public asset. Many of these strategies are partly or fully transferable to other states. Our work with the states, the Library of Congress, and other federal agencies has raised awareness of the issues, created a new communication channel among states, and produced practical assessment tools to help states formulate successful digital management and preservation strategies.

Brian Burke, Senior Program Associate, Center for Technology in Government

Georgia Archives

Georgia has taken a somewhat different approach to leveraging archival principles and enacting its legal mandate to preserve public records. Their strategy involved working with stakeholders to develop a shared understanding of the security value of digital information. As a member of the state governance council that sets IT policy for the state, the Georgia Archives has been able to make the case that good decisions about what information to digitize and what digital information needs to be preserved will help assure business continuity and disaster recovery planning.

The Archives emphasized security and the expectation that certain digital information must remain accessible to those stakeholders who want and need to use it. According to a representative from the Georgia Archives, “When IT folks begin talking about digital records in business continuity, they say ‘let’s just scan everything, let’s make everything electronic, back it up and take it with us when we flee.’ However, then they realize, ‘maybe we should just do the critical stuff. So, what’s the critical stuff?’ And then that’s where we [the Georgia Archives] come in and say ‘we can help you with that, we’ve been doing it for years.’”

New Jersey Division of Archives and Records Management

Even when cost savings is a priority, states can successfully make the case for management and preservation efforts. For example, New Jersey’s Division of Archives and Records Management (NJDARM) determined, through the state’s Public Archives and Records Infrastructure Support (PARIS) Grants Program, that their local government initiatives resulted in a potential average annual cost savings of \$20,000 per local government due to reductions in storage costs of paper records. Based on this amount, NJDARM determined further that if every county, municipality, school district, and major local government unit in New Jersey achieved this level of savings, it would result in statewide annual savings exceeding \$23 million.

Washington State Digital Archives

One compelling argument that addresses the public value of digital preservation comes from the Washington State Digital Archives. When building support for the Digital Archives project, the Digital Archives team took several approaches. They applied basic archival principles to the state’s constitutional mandate to preserve public records and developed a public value framework that addressed the interests of multiple stakeholders in the state. These stakeholders included local government recording authorities, state agencies, and even elected officials such as legislators and the attorney general.

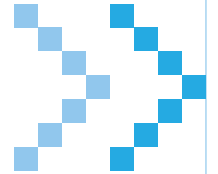
Two of the basic archival principles included in the public value framework were “authenticity” and “chain of custody.” Authenticity refers to the verification of the validity of both the source and content integrity of a publication or record. Whereas, chain of custody refers to the tracking of the history and possession of a publication or record to verify its authenticity. The Digital Archives team successfully linked these two principles to the main interests of their state and local government stakeholders including maintaining legal compliance with statutes that govern the proper management and safeguarding of public records, improving records security, and even avoiding the costs of growth in storage facilities for paper records.



BENEFITS OF DIGITAL ARCHIVES TO CITIZENS AND STATE AND LOCAL GOVERNMENT FROM THE WASHINGTON STATE DIGITAL ARCHIVES FEASIBILITY STUDY AND INVESTMENT PLAN

| Cost Savings | Cost Avoidance | Cost Recovery | Intangible Benefits |
|--------------|------------------------------------------------|--------------------------------------------------------------------------|-------------------------------|
| | Legal fines and sanctions | Copies of certified records | Improved public access |
| | Growth in storage facilities for paper records | State recoveries from lawsuits and settlements (e.g. Tobacco settlement) | Legal compliance |
| | | | Public trust in government |
| | | | Preservation of state history |
| | | | Staff efficiency |
| | | | Improved record security |

Tools for Enabling the Next Stage of e-Government



As e-government advances beyond the early stages of basic information access and simple interactions toward active engagement of citizens and agencies, the tools enabling this progression will be those that promote networking and collaboration while addressing issues of data portability, reusability, and longevity. The flow of information will be the focus as government adapts to new demands for sharing, accessing, and distributing information.

The transition has already begun as technologies and practices introduced within the past few years have had significant effects on citizens' expectations and agencies' ways of doing business. The proliferation of devices and access methods (wireless laptops, cell phones, iPods, to name a few) have transformed how and when people retrieve information. Use of that data is also undergoing dramatic changes as Web leaders such as Google, Yahoo, and Amazon.com and once-small start-ups like MySpace, YouTube, and Flickr have altered our perceptions of information sharing and delivery. And more than perceptions have changed; behaviors are changing too. The past year alone has seen a marked increase in the use of blogs, wikis, and other collaborative software within corporate and government domains.

What does this mean for e-government in the coming years?

- *We can no longer assume that data will be accessed in a set manner at predictable times.* Governments need to ensure their data is portable enough to accommodate virtually any format, even those unanticipated today, and not confined within proprietary software or platforms.
- *We can no longer assume that we will be using data as we have in the past.* The era of one-way flow of information from a producer to a consumer is ending. Data will be shared, linked, transformed, and distributed in a dynamic, collaborative fashion.

As a result, the keystones for the next stage of e-government will include:

- open data standards,
- accommodation of multiple devices, and
- an emphasis on sharing data.



OPEN STANDARDS

Open document standards for government were first brought to national attention in 2005 when the chief information officer (CIO) of Massachusetts endorsed the OpenDocument format for all public records in the state. Three other states—Minnesota, Texas, and California—have subsequently introduced similar legislation. California's bill would require that "all documents...produced by any state agency shall be created, exchanged, and preserved in an open extensible markup language-based, XML-based file format, as specified by the department [of Technology Services]."

Why this movement toward an open XML-based format? The answer is found not so much in what XML *is* from a technical perspective, but in what it *does* from a process and management perspective. Because XML is an open standard, not owned by any vendor or tied to any platform, it creates an environment based on data portability, reusability, and longevity. Government agencies using XML as their document and data management foundation eliminate the danger of that data becoming unusable or obsolete as technology advances. XML also provides a structure for transforming and delivering information to any number of formats, which means cell phones, personal digital assistants (PDAs), and any new devices that come along in the future can be accommodated. And its independent, standards-based design ensures that

THE CHANGING TECHNOLOGICAL LANDSCAPE

Mobile devices are increasingly being used in all nations, but their main growth in recent years has been in developing countries with an average percentage change of 22.8 percent from 2004 to 2005. This figure is even higher for Latin America and the Caribbean with a change of 41.8 percent in the same period. Moreover, according to the *Information Economy Report 2006*, mobile devices are the only indicator in which developing countries are ahead of developed nations in terms of absolute number of subscribers, with 1.2 billion in comparison to 810 million subscribers in developed countries.

With increasingly more sophisticated mobile devices, they could eventually become the main way to access the Internet in many countries; therefore, future e-government efforts should be sensitive to this possibility. XML offers an effective and efficient way to deal with multiple formats and devices without having to duplicate information. The adoption of XML by government agencies in developed and developing countries would not only facilitate this transition, but also proactively create the necessary technological environment for this change to occur. Given the significant difference in the relative cost between a computer and a cell phone, this could also have a dramatic impact on reducing digital inequality.

content stored as XML will not be limited by the shelf-life of a piece of software or hardware.

Organizations using XML realize benefits in information consistency, data integrity, workflow management, and productivity. Several federal agencies in the US have adopted the use of XML including the Environmental Protection Agency, Department of Defense, Department of Education, Department of Justice, Internal Revenue Service, and the Office of Management and Budget. Benefits have even been seen in the use of XML at the state level. Through its implementation of a statewide Global Justice XML Data Model (GJXDM), Pennsylvania's Justice Network set standards and policies for statewide data exchange, reduced development cycles from an average of nine months to approximately six weeks, and showed evidence for potential taxpayer savings identified in the millions of dollars.

MULTIPLE AND MOBILE DEVICES

Government services are not always provided at a desk in front of a computer. Therefore, government needs to accommodate the multiple ways (cellphones, PDAs, wireless access, and many others) and various locations in which government services are accessed. Data needs to be independent of specific delivery formats and reusable across all possible formats to support this changing world. And it's more than just a "nice to have." As we learned from the World Trade Center disaster and Hurricane Katrina, emergency situations depend on decentralized systems, redundant networks, and the ability to share information quickly and constantly with field staff.

Still, while wireless data service (i.e., the Internet on your cellphone) is a large and growing industry generating tens of billions of dollars in the US market alone, the potential of that market for government services has been mostly untapped. One major reason is that the Internet experience on a cellphone is much more limited in terms of speed and display due to the limitations of the devices (cellphones vs. desktop computers). And it's a major undertaking to re-program Web content for the purpose of presenting it in multiple ways. Data formats, such as XML, that can easily transport across different types of devices, hold great promise for bridging this gap.

FROM "NEED TO KNOW" TO "NEED TO SHARE"

Web 2.0 technologies that encourage people to share information—blogs, wikis, and social networking and public posting sites—also make it easier to collaborate with others. Wikipedia is the most well-known of these community of practice sites, but the principles employed there are increas-

ingly being seen within government agencies.

The state of Utah established a public wiki, called *Politicopia*, for citizens to create summaries of bills, pro and con arguments, comments, links, and more on pending legislation as "an experiment in open democracy." Federal agencies such as the General Services Administration have experimented with wikis as a "faster way to work together, combining continuity, transparency and trusted relationships among partners." And national news organizations such as the *Wall Street Journal*, *The New York Times*, and *US News & World Report* have reported on government use of blogs and wikis, including the CIA's launching of its own internal wiki, which grew to 10,000 pages in two years.

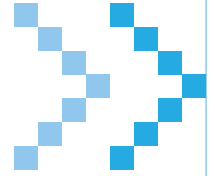
Some of the most interesting activity in this area has occurred within the Office of the Director of National Intelligence (DNI), charged with reporting threats to the president and persuading the intelligence agencies to cooperate more closely. It began experimenting with the use of wikis and blogs in 2005. One blog test site focused on spotting and predicting possible avian influenza. Within two months of its inception, it was reported in *The New York Times* that the site "had become the government's most crucial resource on avian flu." Why? Because it encouraged collaboration and communication and made it easy to do. The transition was from a "need to know" to a "need to share" mentality. This shift in thinking about information and software development is radical. As Dale Meyerrose the chief information officer of DNI remarked in the same *New York Times* article, "We need to think big, start small and scale fast." The blog software took only two days to be up and running; a dramatic change from the usual software development paradigm.

GETTING READY

Over the past five years, CTG has worked closely with government agencies on investigating, adopting, and implementing strategies for data, content, and Web site management based on XML and associated open standards. This work has demonstrated the benefits in workflow improvement, cost reduction, and information consistency. Our current research has extended to the use of wikis, blogs, and other collaborative tools within project management and organizational settings. The future will see more widespread development and application of these tools in advancing the promise and capabilities of e-government.

This article was written collaboratively in CTG's internal wiki by Jim Costello, J. Ramon Gil-Garcia, Donna Canestraro, and Derek Werthmuller.

Internationalizing Digital Government Research



For most of us, the idea of “government” is linked to a particular place. We associate government with a town hall, state house, or capital city and with the laws and policies that apply to the people and organizations located within a specific piece of political geography. Your local government provides fire protection, your state issues professional licenses, the national government defines what it means to be a citizen of your country. At the same time, we recognize that governmental jurisdictions and programs often overlap within a single country. Think about taxation structures, emergency services, transportation networks, and schools as just a few examples.

This pattern of overlapping governmental policies and activities increasingly goes beyond national borders. For example, any

global business that collects personal information from customers must comply with the privacy laws of multiple countries. If you live and work in one country but are a citizen of another, all sorts of special international tax agreements apply to your income. The RFID chip or bar code in your passport will soon be checked by immigration officials all over the world. Government managers negotiating contracts with private sector companies are often not only outsourcing work but also “off shoring” it, along with associated accountability, to people and subcontractors subject to different laws in other countries. International law enforcement, intellectual property rights, and global trade and finance all operate simultaneously under the rules, practices, and cultures of different nations. Broad socio-demographic trends like migration of jobs and workers, global health concerns such

as avian influenza and AIDS, and the environmental impacts of human activity are all concerns for governments on every continent. And all these international activities involve the collection, use, and management of information.

Decades ago, scientists at the Tavistock Institute in London coined the term “socio-technical system” to describe work processes that have equally important human and technical dimensions. Today, that idea has come to be applied in a much broader way to all kinds of systems. In the examples above, human, organizational, and institutional—in other words, social—considerations exist in a mutually influential relationship with networks, software, computers, and other devices—the technical element. Together, they make up the processes and artifacts of our world. The global phenomenon of “e-government” or “digital government”—a term coined by the US National Science Foundation (NSF)—embodies these concepts of complex and dynamic socio-technical systems that are only partly subject to prediction and control.

One response to the international importance of the e-government phenomenon is the emergence of a global network of professional digital government societies, established in 2006 in North America and Europe, with an Asian society to be launched in 2007. Across these organizations, digital government is seen as the use of information and technology to support and improve public policies and government operations, engage citizens, and provide comprehensive and timely government services. Accordingly, digital government research attempts to illuminate and explain this phenomenon by focusing on the intersection of computer and information sciences, social and behavioral sciences, and government challenges and needs.

Today, digital government research is going on all over the world, but so far it has been confined mostly to work that can be done within the geographic and political context of a single country. However, given the growing influence and interaction of truly global economic, social, and political forces, the questions, risks, and opportunities embedded in digital government research are also expanding to international dimensions.

These investigations typically fall into five categories:

- **Benchmarking** studies, the best-known type, rate or rank different countries on observable characteristics of their digital or e-government programs. The *United Nations (UN) Global*

E-government Readiness Reports are a well-known example in which all nations are ranked on selected indicators of their readiness to engage in certain aspects of e-government. These include Internet penetration and the availability of transactional and interactive services. Social inclusion factors cover topics such as provision for online consultation with citizens and availability of services in multiple languages.

- In **best practice** studies investigators evaluate existing approaches or develop new models that appear to be exemplary and worthy of, and feasible for, adoption in multiple countries. These are sometimes tied to award programs to give them visibility. The Organisation for Economic Co-operation and Development (OECD) sponsors studies of this kind using a peer review method and a common analytical framework by which countries can evaluate their e-government policies. This approach aims at international comparability of findings, and accumulates results into a larger body of knowledge and supporting empirical data. Another example is the European Commission’s *eGovernment Good Practice Framework* that provides a knowledge database of good practices, expert advice, and support for transferring effective solutions to common problems.
- **Comparative** studies seek universal theories and transferable practices by studying a defined topic in a variety of cultural settings, using consistent designs and methods, with explicit points of comparison and evaluation. Some comparative studies are conducted simultaneously in multiple countries, others test or apply a framework developed in one country to others. Studies of this kind have explored important topics such as freedom of expression, personal privacy protection, and methods of collaboration across the public and private sectors for delivering services to citizens.
- **Transnational** studies look at an issue or problem that requires interaction among two or more countries. These are very challenging, because they generally require two or more research sponsors in different countries to jointly approve and fund the work. Consequently, most studies of this kind are currently being carried out under the umbrella of the supra-national European Union. There, studies have focused on pan-European topics and services such as personal identity and support for a single employment marketplace.

INTERNATIONAL DIGITAL GOVERNMENT SOCIETIES

Digital Government Society of North America, www.dgsociety.org
European eGovernment Society, www.egov-society.org

In the Western Hemisphere, studies of the information aspects of drug interdiction in the Caribbean, as well as border crossings and trade shipments between the US and Canada, are other examples of this category of research.

- **Global** studies usually focus on major trends and themes associated with cross-cutting developments in technology, governance, societal needs, or government and political reform. While they seldom consider the entire globe, these studies reach further into different regions of the world to increase our understanding of widespread, if not universal, issues. The UN Millennium Project is an example where studies reported on key development goals for eradicating poverty, promoting education, improving public health, and building basic infrastructure. Focusing on the developed countries, an international team sponsored by another European project, eGovRTD2020 is developing a future research agenda for e-government. Of thirteen research themes produced in that study, nine have international dimensions. These include the need for cross-border governance and government's role in the emerging virtual world.

The Center for Technology in Government (CTG) has been involved in international digital government research since the mid-1990s when we joined a Quebec-US-Belgian partnership to study and compare 15 new service delivery collaborations among public, private, and nonprofit organizations in North America and Western Europe. Since then, we have participated in bi-lateral workshops, prepared a variety of international case studies, and collaborated on an effort to understand the global future of e-government. Our most ambitious international work is being carried out under a four-year grant from

NSF that includes a reconnaissance study of current research, support for four international working groups, and an annual residential institute for doctoral students. To date, this work has most often involved partners in Europe, but we are now beginning to forge working partnerships in China and Latin America, as well as with global organizations like the UN.

These varied experiences are beginning to produce a set of methodologies for pursuing comparative and transnational digital government research that address difficult challenges related to the design, execution, language, culture, and context of any research effort that crosses national boundaries. Moreover, we are beginning to accumulate baseline findings about how trust, leadership, risk management, and communication and coordination play out in different cultures. The dynamics of organizational relationships, information and resource flows, and business processes—and ways to model them in universally useful ways—are high on our future international agenda.

All of these opportunities bring with them the rare chance to think globally and locally at the same time. While our research in the US is well-established, our links to partners in other parts of world inevitably add rich new dimensions and broader context to our work. In return, our research methods and results often have value to researchers who are tackling similar questions in other places. Most importantly, these ventures are helping to build a set of long-lasting mutually beneficial relationships that are laying the foundation for what we hope will be a sustainable international digital government community.

Sharon S. Dawes, Director, Center for Technology in Government

INTERNATIONAL RESEARCH SPONSORS AND RESOURCES

European Commission—eGovernment Good Practice Framework, <http://www.egov-goodpractice.org/index.php>

Organisation for Economic Co-operation and Development (OECD)—e-Government Project, Country Reviews [http://webdomino1.oecd.org/COMNET/PUM/egovproweb.nsf/viewHtml/index/\\$FILE/country_studies.htm](http://webdomino1.oecd.org/COMNET/PUM/egovproweb.nsf/viewHtml/index/$FILE/country_studies.htm)

United Nations—Global E-government Readiness Report 2005: From E-government to E-inclusion <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan021888.pdf>

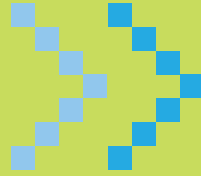
UN Millenium Project—Task Force Report on Innovation: Applying Knowledge in Development http://www.unmillenniumproject.org/reports/tf_science.htm

US National Science Foundation—

Computer Science and Engineering Directorate, Division of Information and Intelligent Systems, <http://www.nsf.gov/cise/iis/about.jsp>

Office of International Science and Engineering, <http://www.nsf.gov/od/oise/about.jsp>

06 Projects



“Government agencies exist to provide services to the public, whereas businesses exist to generate revenue for their owners. Service New Brunswick is somewhat unique in that it exists to deliver government services while being mandated to operate like a business. This [Public ROI] white paper furthers our understanding of public investments in improved government service and the value they generate. Without the concept of ‘public value’ as a return on investment, it would be very difficult to gauge how much benefit a decision to invest in an IT initiative can have.”

*Darrell Fowler, Director, Project Delivery,
Service New Brunswick*

The goal of every CTG partnership project is to build knowledge that improves the way government works. Our projects have helped state, local, and federal agencies increase productivity and coordination, reduce costs, enhance quality, and deliver better services to citizens and businesses. The results generated from each project add to the growing knowledge base designed to support the work of both government professionals and academic researchers.

Since 1993, CTG has conducted 34 partnership projects and collaborated with nearly 100 government agencies, 42 private companies, and 14 academic institutions and research organizations. Our foundation is our work here at home with New York State government, and our projects with state and local agencies continue to provide rich partnerships and opportunities to augment our knowledge and research. However, we also have the privilege to expand our scope of work as we develop new international collaborations and gain recognition as a world leader in digital government research and practice.

INTERNATIONAL

Public ROI—Advancing Return on Investment Analysis for Government IT

Assessing public return on investment (ROI) is a core problem in government information technology (IT) planning and decision making, resulting from shortcomings in currently available assessment methods and models. In partnership with SAP, the purpose of this project was to develop new methods for defining, measuring, and communicating public returns from IT investments in the government sector and to offer government officials recommendations for using these methods in planning and decision making.

Five international case studies examined how a significant government IT investment was conceived and developed, with particular attention to the role of public value in the process. The five case studies were:

- Commonwealth of Pennsylvania’s Integrated Enterprise System
- Government of Israel’s Merkava Project
- Austrian Federal Budgeting and Bookkeeping System
- Province of New Brunswick, Canada’s Service New Brunswick
- Washington State Digital Archives

Interviewees included senior government officials, IT and program managers, and system users in each of the case study sites.

Based on both the case studies data and related research findings, a project white paper was produced, *Advancing Return on Investment Analysis for Government IT: A Public Value Framework*. The report provided a framework broad enough in scope so that it can be applied to virtually any government IT investment—from simple Web sites to governmentwide information systems and architectures.

Building a Sustainable International Digital Government Research Community

Most funded research around the world addresses digital government challenges within the context of a single country; only a few investigations have compared results across national boundaries or tackled problems that are transnational in scope. This National Science Foundation (NSF)-funded project comprises a framework of opportunities for scholars interested in particular domains of study to encounter the work of international colleagues and to engage in discussions that can lead to shared research agendas and joint projects. The ultimate goals are to encourage investigation of international problems and to support comparative studies that seek universal theories and transferable practices.

Three streams of work are in progress: 1) a reconnaissance study to identify and summarize the state of international DG research, 2) an annual residential Institute on International Digital Government Research for doctoral students, and 3) support for four international working groups that were selected by peer review in 2006. The four working groups will meet periodically through 2009 to develop research agendas and products related to urban simulation, online consultation, geoinformatics, and North American digital government collaboration.

eGovernment 2020 Roadmap

The goal of eGovRTD2020, a European Commission-sponsored international project, is to identify and characterize future strategic research fields and possible holistic and dynamic models for governments in the year 2020. Led by the University of Koblenz in Germany, the project involves nine international partners from European regions, the United States, and Australia.

As part of this global partnership, CTG researchers organized two workshops to develop future scenarios and consider the preliminary findings of key future research themes for e-government. These and other scenario-building and road mapping workshops held with digital government academicians and practitioners throughout the world generated 13 research themes for the future e-government research agenda.

The final product of this initiative will be a book detailing the scenarios, road maps, and research themes generated throughout this collaborative effort. For more information about this project visit www.egovrtd2020.org.

INTERNATIONAL WORKING GROUPS

The topics for the four international working groups will address transnational and comparative issues of governmental processes, organization, decision making, and citizen participation:

■ **An Open Platform for Urban Simulation**

Co-chairs:

Paul Waddell, Daniel J. Evans School of Public Affairs, University of Washington and Michel Bierlaire, Ecole Polytechnique Federale de Lausanne, Switzerland

Countries represented:

Canada, France, Germany, Netherlands, Switzerland, United States

■ **Digital Governance and Hotspot Geoinformatics for Monitoring, Etiology, Early Warning, and Management**

Chair:

G.P. Patil, Department of Statistics, Penn State University

Countries represented:

China, Indonesia, Italy, Japan, United States

■ **Online Consultation and Public Policy Making**

Co-chairs:

Peter Shane, Moritz College of Law, Ohio State University and Stephen Coleman, University of Leeds, United Kingdom

Countries represented:

Australia, England, France, Israel, Italy, Slovenia, United States

■ **A Comparative and Transnational Research Agenda in North America**

Co-chairs:

Theresa Pardo, Center for Technology in Government, University at Albany and Luis F. Luna-Reyes, Universidad de las Americas, Mexico

Countries represented:

Canada, Germany, Mexico, United States



NATIONAL EXPOSURE

The April/May 2006 issue of *Public CIO* magazine featured an article by Theresa Pardo, deputy director, and Brian Burke, senior program associate, focusing on the critical role state chief information officers (CIOs) play in managing and preserving government digital information. *Partnering for Preservation* highlighted the consensus among state librarians, archivists, and CIO staff, as well as representatives from the Library of Congress and National Association of State CIOs, on the need to build collaboration between traditional information and records custodians and state government CIOs.

NATIONAL

Library of Congress Collaboration for Preservation of State Government Digital Information

The US Library of Congress is responsible for a national strategy to collect, archive, and preserve the growing amounts of digital content, especially materials that are created only in digital formats. As part of this effort, CTG partnered with the Library to develop strategies for preservation of significant state and local government information in digital form. Working with the leaders of federal agencies and professional organizations serving state librarians, archivists, and chief information officers (CIOs) we designed and launched the State Government Digital Information Preservation Survey in January 2006.

A mix of state libraries, archives, records management agencies, and CIOs from all 50 states and three territories responded to the survey. After analyzing the results, two resources were produced to support current and future state and national digital preservation efforts: *Preserving State Government Digital Information: A Baseline Report* and the *Web-based State Government Digital Preservation Profiles*.

This project helped raise awareness of digital preservation issues, created a new communication channel among states, and produced practical assessment tools to help states formulate successful digital management and preservation strategies.

Modeling Interorganizational Information Integration

Integrating and sharing information within and across governments involves complex social and technological interactions. These dynamic processes, and their implications for better government, are at the heart of CTG's overall research agenda. This particular NSF-funded project began with a study of information integration initiatives in the policy areas of criminal justice and public health. Based on these investigations, CTG researchers are developing a theoretical model of interorganizational information integration and testing it with a survey that reflects the main findings from two New York State case studies, projects in six other states, and previous modeling efforts. The framework addresses the relationships among key variables such as leadership, authority, past experiences, trust building, and clarity of roles and responsibilities and how they influence the outcomes of intergovernmental information sharing.

Leveraging Investments in the Electronic Commons Project

The Electronic Commons is a collaborative program of the USDA Forest Service to identify and fund eight training, technical assistance, and natural resource-related community building projects using advanced communications technologies to share information and solutions on topics of concern to national forests and nearby communities. Of particular interest were projects that linked geographically disparate national forest communities in the 32-state eastern hardwood region. USDA Forest Service asked CTG to assist the grantees as they developed and implemented their projects and to capture lessons learned.

We provided ongoing assistance to the grantees via teleconferences throughout the duration of their projects. In addition, CTG staff facilitated a post-project meeting attended by all the grantees to document the experiences of each project team, examine the factors critical to success, and share lessons learned. A Web-based report is being prepared for release in early 2007.

Project organizers hope that this project will create the foundation for ongoing collaboration among state and federal agencies, nongovernmental organizations, and others with an interest in improving the exchange of natural resource information and ideas.

NEW YORK STATE

New York State IT Workforce Skills Assessment Project

Information technology (IT) workforce issues have been a concern in New York State since the 1980s and were designated high priority areas in the 2004 and 2005 New York State Enterprise Information Technology Strategic Plans. As a result, in early 2005, the NYS CIO Council's Human Resources Committee organized a partnership of state agencies and labor unions, with CTG responsible for project management, survey design and administration, and data analysis and reporting. The goal was to gather information to help the state better meet the training and development needs of its IT professionals, and to identify future needs for IT skills.

Two voluntary on-line surveys were designed, administered, and analyzed; the first was directed to IT employees in New York State and the second to chief information officers (CIOs) in state agencies. The resulting survey report was the first step in a longer term effort. Based on the findings, the Human Resources Committee prepared nine recommendations for next steps and action plans to enhance professional development and skill proficiency for the entire IT workforce.

“When organizers of Electronic Commons decided to include the post-project meeting, we had a sense it would be valuable to everyone, but we had no idea how right we were. Not only were lessons learned captured, but there was a huge amount of peer learning that went on during the meeting.”

Al Steele, Physical Scientist, Northeastern Area,
USDA Forest Service

IT WORKFORCE SURVEY RESULTS

The data from the IT Workforce Survey revealed the following:

- New York State has well educated employees with long tenures in one or two agencies and strong proficiency ratings in fundamental IT topics.
- Retirement projections for nonmanagerial IT employees, managers, and CIOs are mixed. A modest number will retire in the near future, but the rate of planned retirements will increase after 2009 for all three groups.
- A gap analysis revealed the current skill proficiency profile of IT employees does not align closely with the three-year skill forecasts projected by CIOs in key strategic growth areas of Web computing, infrastructure and networking, and information management.
- A stakeholder analysis revealed strong agreement about 14 target areas for statewide training and agency-level leadership attention. These include risk assessment, identity management, wireless technologies, and content management.

Assessing Mobile Technologies in Child Protective Services

In early 2006, the NYS Office of Children and Family Services (OCFS) initiated a pilot program to test how portable information technology could be used for child protective services casework. The aim of the project was to evaluate whether such devices facilitated increased efficiency and effectiveness in Child Protective Service (CPS) investigations. CTG collaborated with OCFS to assess the use of mobile technologies. The pilot program was conducted in two counties, Westchester and Monroe, as well as in New York City, each of which were responsible for designing how the technology was tested.

The assessment was based on surveys, interviews, workshops, and analysis of data from the case management central database. The results show a generally positive impact on performance, but the effectiveness of the mobile device depends on a combination of factors. These include worker preferences, work practice demands, the capabilities of the various devices and systems deployed, and organizational support. Based on these initial results, a second phase will concentrate on a larger scale deployment of wirelessly connected laptops to CPS workers in the New York City Administration for Children's Services.



Meghan Cook, program manager, facilitating a session of participants in the New York State Office of Children and Family Services' mobile technology pilot program.

Web Site Management Using XML: A Testbed Project

As Web sites have grown in size, complexity, and prominence, Web site management, content management, cost, and accessibility have become growing concerns for government agencies. This project was designed to confront these issues and to assist government agencies in examining the benefits and challenges of adopting XML for Web site management. The Testbed engaged five New York State agencies to study best practices, work toward agency-defined practical goals, and build organizational capacity for using XML. Each participating agency developed an XML-based prototype and a business case for further implementation of this approach.

The results were analyzed and evaluated to produce a suite of resources for the benefit of other government agencies. These resources include a Web site, www.thexmltoolkit.org, devoted to tools, tips, and references for using XML for Web site management; a *Getting Started Guide* to assist organizations in the transition to XML; an *Executive Briefing* that highlights the critical business and organizational motives for adopting XML; and a *Lessons Learned* report that captures the key benefits and barriers to XML implementation as identified through the Testbed experience.

Business Analysis of an Electronic Health Record for the Corrections Community

Health care has become one of the largest costs for correctional programs nationwide. This increase in health care spending has prompted the correctional community to look for new models and strategies for managing the health care needs of the inmate population. The New York State Department of Correctional Services (NYS DOCS) partnered with CTG to conduct a business analysis for moving to an Electronic Health Record (EHR) environment. Health Information Technology (HIT), and more specifically an EHR, is seen by many as the ultimate tool for improving the quality of health care delivery, lowering health care costs, and providing better information for patients and physicians.

The study provided a comprehensive description of the current state of medical records in NYS DOCS and discussed the nature of the challenges the agency faces in a transition from a primarily paper-based medical record to a fully-integrated EHR.

Balancing Growth and Public Safety: A New Information Access and Use Model for the Town of Bethlehem

The Town of Bethlehem, with a population of over 31,000, is located approximately six miles from Albany, the capital of New York State. Bethlehem is a suburban community at an important crossroads in its development. It is experiencing unprecedented growth along with the accompanying demand for services. Town managers contacted CTG to work with their management team to develop a new management model that uses information about performance to inform all levels of decision making.

The project focused on the development of a performance measurement framework to support increased access to and use of information in public safety decision making and planning. Recommendations focused on expanding information access to support assessments about the extent to which town resources are used to “achieve optimum service performance at least cost.”

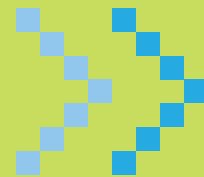


CTG worked with the Town of Bethlehem in upstate New York to develop a new management model that uses information about performance to inform all levels of decision making.

For more information on current and past projects, go to: www.ctg.albany.edu/projects.

06

Disseminating Knowledge



A core aspect of CTG's mission is to take an active role in the community of researchers and managers studying and adding to the growing body of knowledge about information technology (IT) in government. We accomplish this, in part, through our participation in local, national, and international academic and professional conferences. In addition, staff are involved in workshops, panels, and advisory boards at all levels of government and internationally to explore and advise on key issues such as intergovernmental relations, electronic records management, project management, and technology and public policy.

Below is a list of the venues where staff participated as speakers or presented research papers or project findings in 2006, along with the advisory and editorial boards and study panels on which CTG representatives served.

CONFERENCES

International

DEXA eGovernment Conference
Krakow, Poland

7th International Conference on Digital Government Research (dg.o)
San Diego, California

e-Challenges 2006 Conference
Barcelona, Spain

EU IntelCities Research Conference
Sienna, Italy

39th Hawaii International Conference on System Sciences (HICSS)
Big Island, Hawaii

International Conference on E-Social Science
Manchester, England

32nd Meeting of the Section of International Organizations, International Council on Archives
Thessaloniki, Greece

Les Echos VIII Forum International Gestion Publique (Eighth International Forum on Public Management)
Paris, France

SAP Ecosystem Conference
Mannheim, Germany

SAP SAPHIRE Conference
Orlando, Florida

National

67th American Society for Public Administration (ASPA) National Conference
Denver, Colorado

American Political Science Association (APSA) Annual Meeting
Philadelphia, Pennsylvania

Association for Public Policy Analysis and Management (APPAM) Fall Conference
Madison, Wisconsin

Correctional Technology Association Conference
Santa Fe, New Mexico

3rd Annual Gilbane Conference on Content Technologies
Boston, Massachusetts

National Academy of Public Administration (NAPA) Annual Meeting
Washington, District of Columbia

National Electronic Commerce Coordinating Council (NECCC) Annual Conference
Bellevue, Washington

SEARCH Conference
Washington, District of Columbia

XML 2006
Boston, Massachusetts

Regional

FedWeb West 2006
San Diego, California

Government Technology Conference (GTC) East 2006
Albany, New York

Plato Lecture Series, The Evergreen State College
Olympia, Washington

Southern Region Conference on Technology Transfer and Extension in Natural Resources
Hot Springs, Arkansas

New York State

New York State Forum
Albany, New York

New York State Local Government IT Directors Association
Saratoga Springs, New York

EDITORIAL BOARDS

Government Information Quarterly

Journal of Information Technology and Politics

Transforming Governance: Politics, People, and Processes

RESEARCH SEMINARS, WORKSHOPS, AND PANELS

Building Capacity for Enterprise Content Management Workshop
United Nations New York, New York

eGovernance and Free Software: How are they Changing Developing Countries Panel Discussion
United Nations University, International Institute for Software Technology (UNI-IIST) New York, New York

E-Government Workshop
Harvard Policy Group on Networked Governance Boston, Massachusetts

EU e-Government 2020 Roadmap Workshop
San Diego, California

2006 Professional Development Seminar
National Association of Legislative Information Technology Washington, District of Columbia

US-China Digital Government Workshop, DG-INT 2006
Beijing, China

STUDY PANELS AND ADVISORY COMMITTEES

Blue Ribbon Panel
Council of State Archivists

Nominations and Election Committee & Constitution Development Committee
Digital Government Society of North America

EUReGOV Expert Working Group
European Commission Information Society & Media Directorate

Study panel on IT Management at the USDA Forest Service
National Academy of Public Administration

Advisory Committee on Electronic Records Archive
National Archives and Records Administration

Business and Operations Advisory Committee
National Science Foundation

Proposal Review Panel on Information Security
National Science Foundation

New York State Telecommunications Reliability Advisory Council
New York State Public Service Commission

NYS/PEF Professional Development Committee for Successful Web Communications in NYS Government
New York State Governor's Office on Employee Relations



Albert Meijer, Assistant Professor, Utrecht School of Governance, Netherlands presenting on Public Accountability in an Information Age as part of CTG's Research Discussion Breakfast series.

RESEARCH DISCUSSION BREAKFAST SERIES AT CTG

Research Discussions take an informal look at research-in-progress on a variety of government IT topics.

Optical Networks— Different in Kind
Tim Lance, President and Chairman, NYSERNet

The XML Testbed: Lessons Learned and Future Research
Donna Canestraro, Program Manager, CTG
Ramon Gil-Garcia, Postdoctoral Fellow, CTG

Political Communication and the Influence of IT
Jennifer Stromer-Galley, Assistant Professor, Department of Communication, UAlbany

Future Scenarios for e-Government
Sharon Dawes, Director, CTG

Public Accountability in an Information Age
Albert Meijer, Assistant Professor, Utrecht School of Governance, Netherlands

Current Issues in Social Software: Blogging, Wikis, and RSS
Tom Mackey, Assistant Professor, College of Computing and Information Information Studies, UAlbany

Building a Collaborative Framework for Enterprise Content Management at the United Nations

The United Nations is embarking on a significant new initiative to create an infrastructure for Enterprise Content Management (ECM). The size and complexity of the UN make this initiative a particularly challenging one and key leaders have recognized the need for a collaboration framework to guide the critical decision making, planning, and implementation processes. Through a two-day workshop, CTG worked with the UN to design a preliminary collaboration framework; a governance mechanism per se, to guide these critical processes.

US-China International Workshop on Digital Government Research and Practice

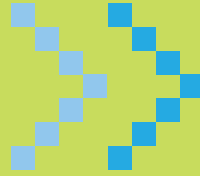
The first US-China International Workshop on Digital Government Research and Practice (IntDG 2006) was held in Beijing in October. The objective was to create an intellectual forum for digital government researchers in the US and China to exchange research ideas, foster research collaboration, and explore collaborative opportunities between the professional DG societies from both countries. The workshop focused on four panels: city government and services; environment; public health; and international digital government research and societies.

Sharon Dawes, director of CTG, served as one of the honorary co-chairs of the workshop and chaired the government practitioner panel. IntDG 2006 was sponsored jointly by the Chinese Academy of Science, the Chinese National Natural Science Foundation, and the US National Science Foundation. CTG graduate assistant Lei Zheng was also a member of the US delegation.



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Resources from CTG

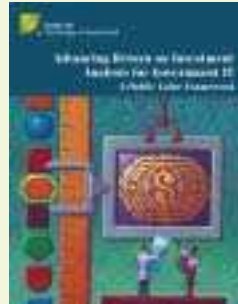


Advancing Return on Investment Analysis for Government IT: A Public Value Framework

IT investments in government need to demonstrate their value in more than dollars and cents. This white paper presents an analytical process that starts with a high-level view of an IT investment and then drills down through successive steps to identify the specific measures and methods that will reveal and document public value. The assessment can be tailored to the size and nature of a particular investment decision. The framework is broad in scope so that it can be applied to virtually any government IT investment—from simple Web sites to governmentwide information systems and architectures.

Preserving State Government Digital Information: A Baseline Report

Partnerships have emerged as the most viable strategy for securing the resources necessary for preserving state government digital information. This report provides the baseline knowledge of current state digital preservation capabilities and activities necessary to launch these critical partnership development efforts. It includes an analysis of a survey of all 50 states and three territories and presents observations on the current digital preservation environment.



State Government Digital Preservation Profiles

A companion to the *Baseline Report*, this Web-based resource provides profiles of state government digital information preservation efforts based on the information collected from the 2006 *State Government Digital Information Preservation Survey*. The profiles are organized by state or territory and the library, archives, and records management units that were represented in the survey responses.

New York State Information Technology Workforce Skills Assessment Statewide Survey Results

An effective state government needs a skilled and experienced workforce. This report provides the key findings of two IT workforce skills assessment surveys administered to nearly 5,000 IT professionals employed in state agencies, authorities, and boards. The two surveys together produced a comprehensive current profile of self-reported demographics, skill proficiency ratings, and training needs of the current state IT workforce, as well as a set of agency-level IT forecasts for the next three years.

Using XML for Web Site Management: Getting Started Guide

Despite the clear advantages of XML-based Web site management, government confronts many obstacles to adoption and implementation. By using the guide, government agencies can gain new insights into the benefits of XML and can develop strategies to address the technical and organizational issues of getting started.

The XML Toolkit (www.thexmltoolkit.org)

The XML Toolkit is a Web-based product developed out of *Web Site Management Using XML: A Testbed*, which helped New York State agencies examine the benefits and challenges of using the emerging technology of XML. The Toolkit contains a library of XML resources and is intended to grow over time and benefit from contributions of the online community.



**Setting the Stage for an Electronic Health Record:
A Business Analysis for the New York State
Department of Correctional Services**

Electronic Health Records (EHR) are emerging as an effective tool to improve health services and contain health care costs. This document reports on a project conducted on behalf of the New York State Department of Correctional Services (NYS DOCS) to explore the likely benefits and costs of an EHR for NYS DOCS. It presents 17 observations regarding the current environment of NYS DOCS and identifies four categories of benefits obtainable through the use of an EHR, as well as seven recommendations for future steps. The recommendations focus on building the capability of the organization to be successful in their effort to implement EHR functionality in the correctional system

Assessing Mobile Technologies in Child Protective Services

Mobile technologies have the potential to increase the efficiency and effectiveness of Child Protective Service (CPS) investigations. This assessment report was prepared under a contract with the NYS Office of Children and Family Services (OCFS). The purpose of the work was to assess the performance of mobile technologies deployed in a pilot test program with CPS field workers. Based on the full range of assessment results and current practices research, the report includes recommendations for further technology deployment and evaluation.

**Balancing Growth: Building Performance Measurement
Capability in the Town of Bethlehem**

Local governments are increasingly concerned with ways to get the best performance out of limited tax dollars. Town of Bethlehem officials asked CTG to work with them to develop a preliminary performance measurement framework for the Police Department to support better use of information for public safety and planning. The report includes fifteen recommendations for moving forward with the implementation of the framework in the police department, as well as a set of critical success factors to consider for extending the performance framework concept to other departments.

PUBLIC VALUE CASE STUDIES

The following case studies were conducted as part of Public ROI—Advancing Return on Investment Analysis for Government IT. The case studies examined how a significant government IT investment was conceived and developed, with particular attention to the role of public value in the process.

Service New Brunswick was launched during a time when citizens were pressuring New Brunswick, Canada for improved service delivery. Today it serves the province through its award winning service delivery model, and maybe more importantly in the long run, through its innovations in economic development.

The goal of **The Austrian Federal Budgeting and Book-keeping System** project was to redesign and integrate the electronic workflow of the federal government’s budget and bookkeeping processes. The project strategy was to develop a single Enterprise Resource Planning (ERP) software standard throughout the federal government, along with the adoption of necessary legal authority.

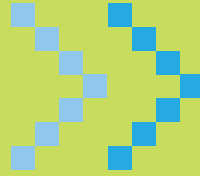
The Commonwealth of Pennsylvania’s Integrated Enterprise System Enterprise Resource Planning (ERP) software implementation put in place the technical infrastructure and enterprise standards for core government administrative functions to achieve improved public value.

The Government of Israel’s Merkava Project is an effort to restructure the financial, logistic, and human resource components of governmentwide administration into an integrated Enterprise Resource Planning (ERP) system. Merkava is also part of a comprehensive eGovernment initiative that includes five layers of new technologies and operational systems for enhanced internal operations and improved benefits and services to citizens.

The Washington State Digital Archives is the first state archives dedicated specifically to the preservation of electronic records from both state and local agencies that have permanent legal, fiscal, or historical value. The goal of the program is to make the historical electronic records easily accessible to the public, from anywhere, at anytime.

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Scholarly Papers



JOURNAL ARTICLES

Challenges and strategies for conducting international public management research.

O. Eglene & S.S. Dawes (*Administration & Society*, 38(5): 596-622)

Expectations and perceptions of benefits, barriers, and success in public sector knowledge networks.

J. Zhang & S.S. Dawes (*Public Performance and Management Review*, 29(4): 433-466)

From agency to structure: Analysis of an episode in a facilitation process.

F. Cooren, F. Thompson, D. Canestraro, & T. Bodor (*Human Relations*, 59(4): 533-565)

Knowledge sharing in cross-boundary information system development in the public sector.

T.A. Pardo, A.M. Cresswell, F. Thompson, & J. Zhang (*Information Technology and Management*, 7(4): 293-313)

The role of knowledge sharing in cross-boundary information sharing.

T.A. Pardo, A.M. Cresswell, J. Zhang, & F. Thompson (*Journal of Special Topics in Information Technology and Management*, Special Issue on Information Sharing Across Multiple Organizations, 7(4): 293-313)

BOOK AND ENCYCLOPEDIA CHAPTERS

Exploring e-government benefits and success factors.

J.R. Gil-Garcia & N. Helbig (In Ari-Veikko Anttiroiko and Matti Malkia (Eds), *Encyclopedia of Digital Government*, Hershey, PA: Idea Group Inc.)

Integrating conceptual approaches to e-government.

J.R. Gil-Garcia & L. Luna-Reyes (In Mehdi Khosrow-Pour (Ed), *Encyclopedia of E-Commerce, E-Government and Mobile Commerce*, Hershey, PA: Idea Group Inc.)

Intergovernmental digital government: Principles and strategies for G2G relationships and applications.

S.S. Dawes & M.E. Cook (In Ari-Veikko Anttiroiko and Matti Malkia (Eds), *Encyclopedia of Digital Government*, Hershey, PA: Idea Group Inc.)

Trust and collaboration: Knowledge sharing in public IT innovations.

A.M. Cresswell, T.A. Pardo, F. Thompson, & J. Zhang (In R. Traunmuller (Ed.), *Knowledge Transfer for eGovernment: Seeking Better Government Solutions*, Linz, Austria: Trauner Verlag)

CONFERENCE PAPERS

Building a state government digital preservation community: Lessons on interorganizational collaboration.

H. Kwon, T.A. Pardo, & G.B. Burke (*Proceedings of the 7th Annual International Conference on Digital Government Research*, USA, pp. 277-284)

Building response capacity through cross-boundary information sharing: The critical role of trust.

T.A. Pardo, J.R. Gil-Garcia, & G.B. Burke (Paper presented at the *eChallenges 2006 Conference*, supported by the European Commission, Barcelona, Spain)

Can government be a good eBay? The use of online auctions in the sale of surplus property.

E. Ferro & L. Dadayan (*Proceedings of the Thirty-Ninth Annual Hawaii International Conference on System Sciences – HICCS '06*, Track 4, p. 68, Los Alamitos, CA: IEEE Computer Society Press)

Challenges of treating information as a public resource: The case of parcel data.

S.S. Dawes, M.E. Cooke, & N. Helbig (*Proceedings of the Thirty-Ninth Annual Hawaii International Conference on System Sciences – HICCS '06*, Los Alamitos, CA: IEEE Computer Society Press)

Comparing integrative models of technology and structure in government.

J.E. Fountain & J.R. Gil-Garcia (Paper presented at the 2006 APPAM Fall Conference *Tax and Spend: Designing, Implementing, Managing and Evaluating Effective Redistributive Policies*, organized by the Association for Public Policy Analysis and Management, Madison, WI)

Digital capability assessment for e-government: A multi-dimensional approach.

A.M. Cresswell, T.A. Pardo, & D. Canestraro (Electronic Government, 5th International Conference, EGOV 2006, Proceedings, *Lecture Notes in Computer Science*, Volume 4084/2006, pp. 293-304, Berlin/Heidelberg: Springer)

Enacting state websites: A mixed method study exploring e-government success in multi-organizational settings.

J.R. Gil-Garcia (*Proceedings of the Thirty-Ninth Annual Hawaii International Conference on System Sciences – HICCS '06*, Track 4, p. 76b, Los Alamitos, CA: IEEE Computer Society Press)

Fostering innovation in electronic government: Benefits and challenges of XML for Web site management.

J.R. Gil-Garcia, D. Canestraro, J. Costello, A. Baker & D. Werthmuller (Paper presented at the *67th ASPA National Conference*, organized by the American Society for Public Administration, Denver, CO)

Is it only about Internet access? An empirical test of a multi-dimensional digital divide.

J.R. Gil-Garcia, N. Helbig & E. Ferro (In Maria Wimmer et.al, eds., *Lecture Notes in Computer Science*, Volume 4084/2006: pp. 139-149, Berlin/Heidelberg: Springer)

Learning about interoperability for emergency response: Geographic information technologies and the World Trade Center crisis.

T.M. Harrison, J.R. Gil-Garcia, T.A. Pardo, & F. Thompson (*Proceedings of the Thirty-Ninth Annual Hawaii International Conference on System Sciences – HICCS '06*, Track 4, p. 70c, Los Alamitos, CA: IEEE Computer Society Press)

Maximizing knowledge for program evaluation: Critical issues and practical challenges of ICT strategies.

S.S. Dawes & T.A. Pardo (In Maria Wimmer et.al, eds., *Lecture Notes in Computer Science*, Volume 4084/2006: pp. 58-69, Berlin/Heidelberg: Springer)

Measuring return on government IT investments.

L. Dadayan (*Proceedings of the 13th European Conference on Information Technology Evaluation – 2006*, pp. 175-185, UK: Academic Conferences Limited Reading)

Multi-method approaches to digital government research: Value lessons and implementation challenges.

J.R. Gil-Garcia & T.A. Pardo (*Proceedings of the Thirty-Ninth Annual Hawaii International Conference on System Sciences – HICCS '06*, Track 4, p. 67a, Los Alamitos, CA: IEEE Computer Society Press)

ROI analysis in e-government assessment trials: The case of Sistema Piemonte.

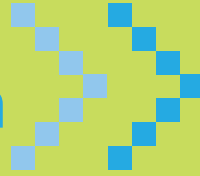
T. Carratta, L. Dadayan, & E. Ferro (Electronic Government, 5th International Conference, EGOV 2006. Proceedings. *Lecture Notes in Computer Science*, Volume 4084/2006, pp. 329-340, Berlin/Heidelberg: Springer)

The effect of organizational/technological factors and the nature of knowledge on knowledge sharing.

J. Zhang, S.R. Faerman, & A.M. Cresswell (*Proceedings of the Thirty-Ninth Annual Hawaii International Conference on System Sciences – HICCS '06*, Track 4, p. 74a, Los Alamitos, CA: IEEE Computer Society Press)

06

Awards and Recognition



Since 1993, CTG has earned recognition from state and national organizations for both our organizational accomplishments and the individual expertise and service of our staff. We have received honors ranging from the prestigious Ford Foundation's Innovations in American Government award to *Governing* magazine's Public Official of the Year award. Each award and honor has special meaning to our organization, and we thank those who have extended this recognition.



Members of New York IT Workforce Skills Survey, State CIO Council: Human Resource Committee are pictured above: (L to R back) Kathy Ravida (OFT), David Gardam (OASAS), Sharon Dawes (CTG), Ron Minafri (DOI); (L to R front) Elaine Ehlinger (OFT), Natalie Helbig (CTG), Melinda Hicks (GOER), Marilyn Cordell (OFT); (Not shown) Frank Slade (CS), Jay Canetto (OSC), Terri Daly (OFT), Celia Hamblin (DOL)

In 2006, we received the following awards:

BEST OF NEW YORK AWARD

The Center for Digital Government and *Government Technology* annually honor New York's most innovative, tech-savvy state and local government leaders and agencies with their prestigious *Best of New York* award, which recognizes excellence and outstanding contributions in the area of information technology. CTG was a key partner with the State CIO Council and Human Resource Committee in the New York IT Workforce Skills Survey that won in the category *Demonstrating Best IT Collaboration Among Organizations*.

BEST OF THE WEB AWARD

The New York State Forum's *Best of the Web* award annually recognizes the outstanding work done with the innovative use of Web technology by New York state and local governments. CTG's online *XML Toolkit* site was honored for its innovative use of technology, value to clients, and cost efficiency to government agencies. The toolkit is designed to help agencies implement XML-based Web site management, which offers great savings and efficiencies in streamlined workflow, consistency of content, and accuracy of information.

BEST PRACTICE AWARD

The New York State Forum's *Best Practices* award acknowledges the work done each year by New York state and local government organizations in the area of Information Resource Management. The NYS/PEF Professional Development Committee's project *Successful Web Communications in NYS Government* was honored this year for the development and implementation of a statewide training program. CTG is a member of this committee, which is sponsored by the New York State Governor's Office of Employee Relations.

CHARLES EVANS HUGHES AWARD

The Charles Evans Hughes Award is one of the most prestigious awards presented by the Empire State Capital Area Chapter (ESCAC) of the American Society for Public Administration (ASPA), the nation's most respected society representing public service. This year, the award was presented to CTG director Sharon Dawes in recognition of outstanding individual service that has exemplified long-standing superior management and administration within New York State.



**DIGITAL GOVERNMENT SOCIETY
OF NORTH AMERICA**

The Digital Government Society of North America was formed in 2006 to serve the interests of a community of scholars and managers interested in the development and impacts of digital government. It is built on a foundation made possible by the US National Science Foundation Digital Government Research Program, which sponsors research and community building at the intersections of computer and information science, social and behavioral sciences, and the needs and problems of government.

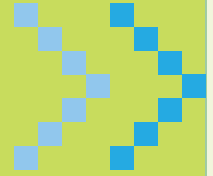
The Society welcomes members from all sectors, endorses diverse, multi-, and interdisciplinary research undertakings relevant to both theory and practice, and strongly encourages practitioner-researcher exchanges at local, regional, national, and international levels.

Members elected Sharon Dawes, director of CTG, as the Society's first president.

For more information go to www.dgsociety.org.

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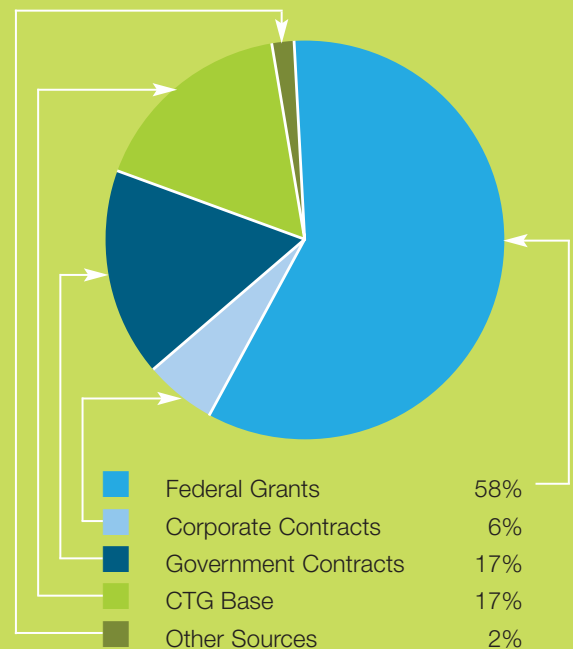
Financial Portfolio



In 2006, our diverse funding portfolio included both multi-year and short-term collaborations at the local, national, and international levels. Funded projects covered a wide range of topics and areas of interest giving us the opportunity to explore important public problems and to share the practical results both locally and globally.

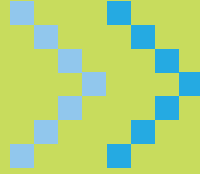
This funding allows us to not only conduct the work, but to also offer the resulting project reports and practitioner guides on our Web site without charge. In addition, they are available in several formats, allowing access to all those interested in learning more about our signature methodologies, new models of thinking, and innovations for improving services and operations of state, local, and federal government agencies.

About half of our funding comes from federal grants, one quarter from contracts, and the remainder from our University at Albany base budget and other resources.



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Project Partners



BUILDING ON STRONG FOUNDATIONS AND THE GENEROSITY OF OUR PARTNERS

CTG projects depend on active and ongoing partnerships with government agencies, technology companies, and academic scholars. From in-kind donations of equipment, expertise, and time to grants for applied research, these partnerships account for more than half our total resources.

We are grateful to the organizations listed to the right who supported our work in 2006.



Peter Cambier, Vice President, Northern Initiatives presented at the Electronic Commons post-project meeting in Albany, NY, facilitated by CTG.

Academic

Digital Government Research Center, Information Sciences Institute, University of Southern California
University of Georgia Cooperative Extension
University of Minnesota, Natural Resource Research Institute
Virginia Tech, Department of Forestry

Government

Chequamegon-Nicolet National Forest, Wisconsin
Monroe County Department of Human Services,
New York State
National Science Foundation
New York City Administration for Children's Services
New York State Department of Civil Service
New York State Department of Correctional Services
New York State Division of Housing and
Community Renewal
New York State Governor's Office of Employee Relations
New York State Higher Education Services Corporation
New York State Office of the Chief Information Officer
and CIO Council
New York State Office of Children and Family Services
New York State Office of Cultural Education,
State Education Department
New York State Office for the Prevention of Domestic
Violence
New York State Office for Technology
United States Department of Agriculture Forest Service
United States Library of Congress
Westchester County Department of Social Services,
New York State

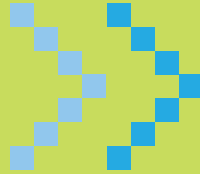
Corporate

Hewlett Packard
Iceni Technology Ltd.
Logictran
MicroKnowledge
SAP
Sun Microsystems
SyncROSoft Ltd.

Nonprofit

The Nature Conservancy of Michigan
The Nature Conservancy of Indiana
Northern Initiatives, Michigan
Shelburne Farms and Green Mountain National Forest,
Vermont
The Stewardship Network, Michigan

Staff



Director

Sharon Dawes

Professional Staff

G. Brian Burke, Senior Program Associate
Donna Canestraro, Program Manager
Meghan Cook, Program Manager
James Costello, Web Application Developer
Anthony M. Cresswell, Deputy Director
J. Ramon Gil-Garcia, Postdoctoral Fellow
Paula Hauser, Administrative Assistant
Alison Heaphy, Communication Manager
Natalie Helbig, Program Assistant
Jana Hrdinova, Program Assistant
Linda Keane, Administrative Assistant
Jane Krumm-Schwan, Director of Administration and Outreach
Gloria Lisowski, Administrative Assistant
Theresa Pardo, Deputy Director
Anna Raup-Kounovsky, Program Staff Assistant
Derek Werthmuller, Director of Technology Services

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Information Science, UAlbany
Ophelia Eglene, Middlebury College
Teresa Harrison, Communication, UAlbany
Jing Zhang, Clark University
George Richardson, Public Administration and Policy and
Information Science, UAlbany
Giri Tayi, Management Science and Information Systems,
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Lucy Dadayan, Information Science
Denise Dreany, Information Studies
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Hyuckbin Kwon, Public Administration and Policy
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