

Four Realities of IT Innovation in Government

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Introduction

The Center for Technology in Government (CTG) at the University at Albany/SUNY celebrates its fifth anniversary this year. Since 1993, CTG has worked with more than 100 New York State and local government agencies on projects designed to increase their understanding of how information technology can be effectively used to transform public services. The projects have ranged from economic development to mental health to intergovernmental relations, and have involved technologies ranging from decision support to geographic information systems to advanced data integration and analysis tools.

In these projects, we've seen first-hand what it takes to turn a promising technical idea into a productive system. We've seen how difficult this is to do--to identify opportunities in a fast-moving technological environment and apply them within the deliberate and slower pace of government processes. We've seen how government decision-making, with separation of powers and multiple points of review, can create frustrating roadblocks to rapid innovation. At the same time, we've also seen how governments can make it work -- how agencies and individuals with vision and commitment can use technology to make substantial improvements in the quality of government services, often at a reduced cost. We've seen how people working within the complexities of government can build the coalitions and master the technical details to create effective and innovative government services supported by technology.

This article discusses some of the general lessons we have learned from five years of project experience. In these projects, government agencies work in partnership with the private sector and the academic community in the pursuit of new ways to use computing and communications technologies to solve practical service delivery and administrative problems. Over the years, we have been involved in a variety of projects. Most were initiated by the programmatic needs of agencies, while others focused on issues associated with a class of emerging technologies. Our initial projects tended to focus on a program need of a single agency, while more recent projects have tackled strategic cross-agency issues such as interorganizational information systems and data sharing. Our goal is to help project participants develop sufficient understanding of the interplay among policy, management, and technology issues to inform their IS initiatives, and to make materials and advice available to others facing a similar situation.

The IT environment we work in

The government information technology environment is one of opportunity and risk. The world has changed because of information technology, and so have the public's expectations of government. With ready access to personal computers and electronic information in the business community, people expect a comparable level of service from the public sector. They want a government that is organized around their needs and available 24 hours a day.

Government managers are working hard to incorporate innovative technologies into the way government works. They see value in using data mining tools to evaluate their services. They see how electronic commerce can improve responsiveness and reduce costs. They see the Internet as a way to exchange data between stovepipe applications to streamline services. These and other technologies offer enormous opportunity, and have been used very effectively in government.

At the same time, government agencies are grappling with a number of complexities: significant public policy shifts, budgetary constraints, and the unique decision-making environment that is the result of our democratic system of government. Within this context, IT managers are trying to maintain currency with emerging technologies, address the Y2K problem, and deal with the shortage of IT-skilled workers and aging technical infrastructures. As a result, IT innovation in the public sector bears a special element of risk – a risk highlighted by the press every time a significant public information system goes over budget or fails to meet a deadline.

What we've learned in our projects

Four broad themes or “realities” have emerged from our first five years of project work. In our experience, these realities can make or break a project.

1. *Program needs must drive IT innovation.* While this may sound cliché, government program goals must be the driver. Far too often, it is the technology proponents who initiate a project. This usually causes problems in the long run.
2. *Use a learning model in developing a system – prototype it, evolve it, measure it.* Program goals should drive the development of the entire system, and should define the expectations of the system. Starting with those expectations, it's best to start small and allow for evolution based on working experience. By paying attention to the goal from the start, you're in a position to measure your results against your objectives and improve your system in incremental steps.
3. *Government is complex -- deal with it.* It's hard to develop government IT systems for many reasons – systems involve more than one level of government, systems involve the not-for-profit and business communities, government development takes place in a fishbowl, many people have a stake in most projects. Never underestimate the complexity of what may look like a simple problem. And this complexity cannot be wished away; it needs to be faced squarely and managed accordingly.
4. *Professionalism and personal commitment make a real difference.* A very important factor in ensuring project success is the commitment and professional dedication of the IT and program staff who design and develop the system. They set the tone, establish a culture of innovation, and take the calculated risks that are necessary to

effect real change. It is critical that these individuals envision IT solutions in the context of programmatic objectives, and that agencies empower them to lead and act.

The manner and degree to which these themes or ‘realities’ are addressed influences the success of IT projects in government. While the first two are similar to standard business-school maxims, the latter two may be uniquely governmental. We describe these ‘realities’ more fully below.

Reality #1: Program goals are the driver, technology is the vehicle

In an age where technology seems to promise everything, a public manager is often asked to simply solve problems with the “latest, greatest” technology. Going to a trade show, with a dazzling array of technologies attractively presented, only compounds the situation. As one public manager described it, “our commissioner sees a new technology and without understanding the implications of the change, decides we should ‘go out and get some.’” However, when it comes time to deal with the training needs, policy implications, and staffing requirements associated with this decision, the high-level support may diminish or disappear.

If your goal is better service, consider the outcomes first

The drive to use the Internet as a new mechanism for service delivery is a good example. As the Internet took off, government agencies, many under directives from upper management, rushed to establish World Wide Web pages. Many local governments were among the first to develop Web sites. However, in the rush to “get something up” few stopped to consider the management and policy implications associated with this new mechanism of information and service delivery. Who would answer e-mail requests? Who would update the Web site? What information was needed on the Web site? What about security and issues of confidentiality? What about maintaining access to this information over time?

The list of issues could go on for pages. Inevitably, many of those managers who went forward found that doing business “on-line” is just as complex as doing it the old fashioned way and in many instances much more so. Technology offers alternatives that can allow services to be delivered better, cheaper and faster but, just like the old system, people, processes, and policies must be in place and managed well if the technology is to truly “change the way we do business.”

Technology is a powerful agent and enabler of change

While technology cannot and should not be in the driver’s seat, it can play a significant role in changing the way government does business. Seeing examples of IT applied to important goals in the public or private sector can stimulate creative thinking that can lead to ideas for improved services and more efficient operations.

One example is New York State’s GIS Clearinghouse. The Clearinghouse allows both public and private organizations that have spatial data sets to describe and share them

with others who could benefit from their use. By doing this, the significant costs and benefits of developing digital spatial data sets can be spread among a number of users. The World Wide Web provided a good vehicle to support the sharing of information, so CTG worked with a range of private and public organizations to create a prototype system to support the sharing of existing data resources. By demonstrating that a system like this could work to the benefit of many different users, a host of management and policy issues were identified and people began to see that the benefits of sharing make the effort to resolve the issues worthwhile. Today, the clearinghouse is a valuable statewide information resource maintained on-line by the New York State Library and supported by a formal GIS Coordination Program.

Reality #2: Government IT innovation should be approached from a learning perspective – prototype it, evolve it, measure it

We have found that IT innovation is more than anything else a learning process – from broad consideration of program needs, stakeholders and their goals, to a review of others’ practices and experiences, to prototyping and evaluating solutions. We use and advocate an evolutionary approach to system definition and development and urge our partners to be explicit about how they will incorporate and measure the factors to define success.

Start small and grow

Whenever possible, it’s best to take an evolutionary approach to designing and building information systems. When starting with a technology that is new, it is particularly difficult to anticipate every need that the technology can address – or every problem it can create. Thinking in the abstract about how a technology can be used usually doesn’t lead to the best ideas. Therefore, we recommend that projects begin by trying out the technology in an experimental environment before pilot or full implementations are attempted.

There are many advantages in doing this. By testing a technology outside of a production environment, the pressures of doing it right the first time are alleviated. By exploring the technical resources needed to construct the prototype, the exercise can help point out what will be needed to support the ultimate system. If the prototype shows users how the system will look and behave, it will not only help fine-tune the requirements of the full system, it will also help in devising implementation plans and building organizational support for the full system. This better understanding makes it more likely that when a system is ultimately built or procured, it will meet the real needs of the organization.

Starting small also helps deal with occasional executive directives to “get me some of that.” Developing a prototype will demonstrate quickly how well an idea might work; it can save money and possibly prevent an embarrassing failure. Growing a system allows you to take advantage of improved technology. A phased or evolutionary approach will also allow for early results – something tangible and useful that will grab people’s attention and let them see how the system might be of use to them.

A key to using a phased approach is to build systems that maximize flexibility. Avoid locking into non-standard tools and technologies that will close the door for future changes. Identify system options that will demonstrate the direct value of the system to users and decision-makers so that they will see its value and support subsequent phases of activity. And revisit the program or business objectives early and often as new phases are planned.

Measure it

Despite the declining costs of many information technology components, most government IT projects are expensive. How do you know if the benefits of an information system will exceed the costs? You measure them.

Identifying the costs of a system implementation is often the easy part. The key is to be comprehensive, and include ongoing or annual as well as development costs. The costs of data preparation may exceed those for hardware and software, so it's important to include them as well. Training costs and ongoing maintenance must be identified. Hiding or ignoring these ancillary costs is not an appropriate strategy – it doesn't do any good to see a system wither and die because funds to maintain it were not allocated.

Estimating benefits is usually much harder. Many of the expected benefits may be intangible or difficult to quantify. Often, new benefits of a system are only identified after the system has been developed because it allows you to do new things. You may not be able to put a dollar figure on some of the most important benefits, but describe them anyway. Mixing quantitative and qualitative descriptions of benefits is okay, just be as explicit as possible.

In identifying potential system benefits, look for and estimate cost savings associated with system implementation, reductions in the time it will take to serve customers, and improvements in the quality of service or decision making that may result. Estimating these 'cheaper, faster, better' benefits is difficult -- often painful, but it is very important.

This kind of analysis can go a long way in making a business case, justifying a budget request, and promoting a common understanding of why a project should be supported. Done early, such an analysis can help identify the main phases of a project so that key stakeholders see benefits early and continue to support the project through subsequent phases.

Reality #3: Government is complex – deal with it

Many of the most critical public policy issues or problems addressed by government cross program areas, and span levels of government, agency boundaries, and economic sectors. As of 1992, there were 85,006 governmental units in the US. In New York State alone, there are 3,299 units of government. None of these government organizations is autonomous, but they do different things and exercise different forms of authority. Their relationships are not simple. Depending on the circumstances, they work cooperatively

with each other, they give one another mandates or apply regulations, and they exchange information and other resources. In doing this, they interact to form what citizens expect to be a cohesive "government." In fact, the cohesiveness comes with a multiplicity of differences -- differences of responsibility, viewpoint, authority, tradition and approach. Adding the private and non-profit sectors to the environment only makes it more complicated. Into this environment go complex social objectives: public education, social welfare, public safety, and economic development. Stakeholder views are many and diverse. The effective design and implementation of government information systems must recognize and take into account all of this complexity and diversity.

Stakeholder and program complexity -- the dissension is in the details

A major step in dealing with complexity is to create a common understanding of goals across stakeholder groups. Project or program participants often come to the table believing that they have a common understanding of a problem and how IT can help solve it. However, we have discovered that methods such as process mapping often uncover very different perceptions of what the *real* problem is that a group is trying to solve. When pressed further, the supposed common understanding of problems and solutions is often only skin deep. There is agreement around the abstract. The dissension -- and the answer -- is often in the details.

Dealing with this reality is a time-consuming, painstaking, and worthwhile task. Successful government IT projects may require buy-in from a multitude of actors, modifications to laws or policies, or redefinition's of regulatory relationships. Key stakeholders should be brought into the planning process at an early stage. Such tools as stakeholder analysis, process mapping, and cost-performance analysis can help uncover significant disagreements about problems and potential solutions. Visual representations of problems such as formal models of an environment can help create a common picture of a problem and potential solutions.

Reality #4: Professionalism and personal commitment

In reviewing our projects for this article, we were struck with the levels of personal commitment and professionalism that motivate public managers to effect positive change. Without dedicated professionals who made personal investments, many projects would have failed. Professional integrity, demonstrated in difficult decisions and steadfast commitment to long-range goals, was also very evident in successful projects. This occurred over and over despite the fact that these actions were seldom individually recognized or rewarded.

Personal investments often augment agency investments

Government managers are drawn to projects at CTG by their interest in improving services through effective applications of technology. However, they are also drawn by their interest in learning about new technologies and management trends, by the opportunity to participate in a high profile project, and by the chance to act on their personal commitment to their jobs. Personal commitment to projects was evidenced in

many ways. Staff members spent their own time training themselves to understand new technologies and management issues. They bought books and used their home computers to search for reference materials on the Web. In extreme cases, people used their own money to buy hardware components and software to test whether they might work in their agencies.

Professionalism helps resist the allure of technology

New technologies receive a lot of attention in the popular and business press. Often IT initiatives are launched in reaction to unchallenged assumptions about what a technology can do. Top level executives are sometimes unaware or ill informed about the specific impact a particular technology might have on agency performance. Project teams are often left to establish a purpose and focus for their efforts. Individual professionalism was a significant factor in efforts to resist the temptations of using technology for its own sake. In our experience, high levels of professionalism allowed project teams to find the right "match" between the technology and program needs by insisting that technology be addressed within a framework of program requirements.

It takes real commitment to prototype, evolve, measure, and learn from experience

In government, program evaluations are used to guide program refinement, policy development, and resource allocation decisions. However, in government (and elsewhere), we seldom evaluate the effectiveness of our information systems. The steps are not as clear, the models not as robust. However, it is possible. Our government partners have developed conceptual frameworks and skills necessary to carefully test or prototype technologies, to start small and learn from experience, to apply that learning to the next stage of evolution, and to measure the effects of their efforts on customers and agency alike. Government managers that we have worked with have been willing to back out of a particular path if experience tells them that the desired benefits are not there. They've demonstrated that it's a good management decision, not a bad one, to pull out of a project that you've determined won't meet your needs at an affordable price.

Skill and willingness to work with, not against, the complexity of government

Working within the complex government environment is a challenging task and not one for the faint of heart. In our experience, committed, professional government managers are well informed and tenacious in dealing with the environment. They focus on the outcome while dealing with all the internal and external influences that can stall a project. They resist the simple answer and reject an "us vs. them" mentality. Instead, they are inclusive, good listeners and communicators, resourceful, and respectful of the viewpoints of others. Projects have been successful thanks to the willingness of our government partners to address the complexities of government head-on and to manage them actively from outset to conclusion.

Conclusion

None of the first three realities make it easy to develop effective information systems in government -- and the fourth alone cannot entirely overcome these hurdles. Often, the

easiest way to deal with a directive to "just do it" is to just do it, sometimes with disastrous consequences. Going with a well-advertised solution may be easier than defining your goals and measuring whether you have achieved them. Working behind agency walls may be easier than opening the doors to wide participation in program and system development. The projects at CTG have shown that resisting the temptations of technology for technology's sake requires a commitment to purpose, and may require a willingness to stand firm against a tide of uniformed enthusiasm.

In order to promote and reward more effective approaches to IT development, it is necessary to develop a culture in government that encourages innovation, fosters experimentation, and values thoughtful analysis. IT is a powerful means of effecting change, but it is up to public managers and the people they serve to define the changes they want and the ways they want to achieve them.

The Center for Technology in Government is an applied research center devoted to improving government through technology, management, and policy innovation. Created by the State of New York in 1993, the Center is an Innovations in American Government Award winner.