MUNICIPAL INFORMATION SYSTEMS: CURRENT PRACTICES AND ISSUES

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ABSTRACT

Interesting strategic and creative uses of IT in municipalities has been under-reported as there has been a major emphasis on for-profit entities. System integration, GIS, and other applications of IT create challenges and opportunities that seem unique to local governments. With the new GASB 34 that mandates state and local government information reporting, smart and creative IT application is critical. We discuss these points and our observations from interviewing the IT managers from some local governments.

Keywords: municipal information systems, geographic information systems, GASB 34, local government

INTRODUCTION

This paper reviews current practices in information technology (IT) use by some local government organizations. It also discusses some issues and challenges facing municipalities with respect to information systems (IS) use. Several studies have shown that the public sector routinely uses IT in operations (3). In fact, 97 percent of all US cities use IS technology and 100 percent of cities with a population over 50,000 use IS technology (7).

MUNICIPAL IS USE LITERATURE

Although IS usage is pervasive in both the public and private sectors and continues to experience exponential growth (3), there is still much we don't know about how municipalities can maximize the benefits of IS. A number of phenomena have been reported concerning public sector IS usage that seem to mirror the private sector. For example, (4) reported that the major determining factor in the extent of IS adoption is city size. Larger cities have greater needs for advanced computer systems than smaller cities. Larger cities have larger IS budgets and usually have centralized systems as well as personal computers (PC).

Another major finding in (4) concerns usage of mainframes versus microcomputers. Anecdotal evidence suggested that people were dissatisfied with mainframe computers and that they welcomed the PC revolution. However, cities that used mainframes had higher levels of satisfaction and were more sophisticated than PC-only cities. The authors gave many reasons for

the discrepancy between the perception and the reality of mainframe and PC computing in the public sector. One reason is that mainframe departments have developed over a long period of time and so support in the form of an IS department has been institutionalized. The IS department supports, trains, and responds to users in a mainframe city whereas PC-only cities tend to be smaller and support comes in the form of "volunteer gurus." Another reason for the discrepancy is software. Most mainframe software was custom-built and was closer to what the users needed whereas PC software was predominantly "off the shelf."

Public sector units are using IS not only for standard operations. Certain leading edge IS technologies are also being adopted for other uses that include planning and development, traffic management, voter district management, etc. Some examples follow.

State departments of transportation in Utah, Minnesota, Wisconsin, Kentucky, New Jersey and others are using and/or experimenting with road weather information systems (RWIS,) which employ environmental sensor stations (ESS) to monitor weather conditions at key points on important highways and bridges (1). The main goal of these systems is to support anti-icing and de-icing strategies. "Some RWIS are integrated with automated bridge deck anti-icing systems featuring nozzles that spray the roadway with anti-icing chemicals pumped from storage tanks underneath the bridge" (1 p. 65). Such systems allow huge improvements in efficiency and effectiveness in the battle against snow and ice, while also saving governments money.

Another highway application is Maryland's Chesapeake Highway Advisories Routing Traffic (CHART) program (8.) This system uses a series of video cameras and radar speed detectors. Television and radio news stations have access to the information provided by the system, and the information is also available on the State Highway Administration's web site. Use of this system has helped maintain smooth traffic flow and restore traffic flow after accidents.

Additional examples of innovative applications of IS technology in government include workflow management (2,) credit card processing (5), police information systems (6) and of course, Internet applications such as the City of Alexandria, Virginia's web site: http://ci.alexandria.va.us (9). While descriptions of many individual applications may be found by perusing (mostly) trade and (some) academic literature, integrated and comprehensive reviews of municipal IS usage are hard to find.

SITE VISITS

In order to gain understanding about municipalities and their use of IT, we have conducted site visits at several cities. Site visits allow for collection of rich data and a more thorough understanding than mail surveys or telephone interviews. In each case, the manager in charge of information systems was interviewed with a least two researchers present.

Salt Lake City

We interviewed the deputy director of Information Management Services (IMS) at Salt Lake City. He reports to the City Recorder. His organization includes 55 employees and operates on a budget of over $6.6 million, including IT support for all city functions and departments except the city library. Responsibilities of the organization include the general technology direction of

the city, computer support, PC maintenance, network support, software development, telephone infrastructure and support, and a help desk.

Although city residents actually see little of the capabilities and services provided by IMS, they do have access to several city systems, including web payment of utilities and parking tickets. The city plans to make available online the application process for permits and licenses soon. All city ordinances may be viewed on the web. IMS also makes available the capability to see voting districts, polling places, and elections results. The city does not show candidate profiles online, nor do they list sexual offenders. They do not have capability for submission of grievances.

Some issues perceived as important include standards for hardware and software, integration of various systems within the city, the geographic information system (GIS), and coordination with other municipalities. The deputy director perceives Salt Lake City as a leader among cities in information technology adoption and use.

Provo City

The director of the Provo City Information Systems Department said his department is understaffed with 17 members. They operate with a budget of just over $1 million. Major responsibilities include police support (79 laptop computers in patrol cars with a wireless network), the city's web site, and other city functions. The main concerns of the mayor and city council are police/public safety, fire response/protection, lower costs to citizens (taxes, utilities),. The city has 570 computers for 700 employees.

Some of the capabilities offered through the city web site are general city information, calendar, zoning, and frequently asked questions. Capability for fee payment is coming soon. Self-submitted profiles of election candidates are available, as well as election results. Photos and information on current city council members are also online.

Although several city departments have their own systems, there is not an integrated GIS at Provo City.

Ogden City

At the time of our interview, the Director of Information Systems at Ogden City and her 14-member staff were just completing a two-year computer replacement project involving about 550 computers. In addition to the replacement project, they were working on a consolidation project to unify four dispatch centers serving 12 different agencies into one dispatch consortium. The federally funded effort involves several neighboring cities and Weber County. The director believes that IT is probably the second or third highest priority for the city. The federal grant has inflated their budget to around $3 million.

All city ordinances, city council and planning meeting times and minutes are on the web, as are job openings. There were no politicians' profiles on the web for the last election due to arguments about space and broken links. They plan to resolve these problems in the near future.

About one fourth of her staff works on the GIS. They are working with the county to coordinate the city's GIS layers database with the county's GIS.

Leading Edge Technologies Adopted in Municipalities
Automated Fingerprint Identifcation Systems
Automated Traffic Control Systems
Automated Vehicle Locator
Bar Code Technology
CD ROM
Computer Based Training
Electronic Commerce
Electronic Data Interchange
Fax Modems / Fax Servers
Geographic Information Systems (GIS)
Global Positioning
Hand-held Computers and PDAs
Imaging
Interactive Voice Data and Video
Interactive Voice Response
Internet Access and Use
Intranets
Long Range IT Plan
Mobile Data Terminals
Multi-Media
Optical Disk Storage
Public Access Information Technologies, including:
Automated Transaction Machines
Bulletin Board Systems
External Dial-up
Kiosk
Public Access Terminals
Remote Sensing Data
Scanners
Wide Area Networks
World Wide Web Applications (e.g., Home Page, Web Site)
Video Arraignment

Table 1

Common Functions

Local governments deal with many of the same issues that challenge businesses. While each city employs IT in unique ways, there are many functions of city government that are commonly handled by IT. Table 1 lists several applications of IT as they are employed in municipalities.

ISSUES IN MUNICIPAL INFORMATION SYSTEMS

Some common concerns among the cities we visited were system integration, cost containment, and geographic information systems. As in business, leaders and management in government recognize that investment in IT for the sake of technology is not wise. Rather, they are concerned

about acquiring systems that work well with one another. Particularly in areas like law enforcement and emergency services, integration of current stand-alone systems is a top priority.

Containing costs is another concern that weighs heavily on local government organizations. Of course, taxpayers want their tax bills to be low, so there is constant pressure to keep costs under control. Naturally, information technology is considered an option to help reduce the cost of doing business. However, IT costs can be significant so budgets are managed very carefully in the cities we visited. Particularly, the interviewees were unanimous in their desire for more staff.

Geographic Information Systems attract keen interest from city IS managers whether they have one in place or not. Because so much of city government work is concerned with geography-related issues, cities have a compelling interest in developing and maintaining a GIS. One city's GIS had more than twenty layers of information including street center lines, flood plains, garbage pickup zones, voting districts, sidewalks, railroads, wetlands, waterways, and more.

One issue of major concern to all local governments, as well as state governments, is the emergence of a new accounting standard known as GASB 34. The next several paragraphs describe the impact of this standard and its implications for municipalities.

GASB 34

Unanimously approved by all seven members of the Governmental Accounting Standards Board (GASB) on June 10, 1998, Statement No. 34 (GASB 34) represents the most comprehensive accounting rule for government ever developed. GASB 34, *Basic Financial Statements – and Management's Discussion and Analysis – for State and Local Governments*, requires municipalities to report on the value of their infrastructure assets. While loose reporting standards are allowed, state and local governments will need to make substantial efforts to develop standard methodologies and fully document their reporting practices.

GASB 34 was developed to give government officials more responsibility in the controlling of their assets through both fiscal and operational accountability, which is stated as the principal objective of governmental financial reporting. In doing this, governments must provide useful, relevant, reliable, and understandable information to allow for more accurate and complete financial analysis by auditors, bond rating agencies, and the public. The requirement of accrual accounting and the inclusion of infrastructure reporting focuses on the importance of the world's finest highway system and its preservation at a reasonable cost (via reporting with the Modified Approach) or its premature replacement after complete depreciation.

Infrastructure assets are defined as "long-lived capital assets associated with governmental activities that normally are stationary in nature and can be preserved for a significantly greater number of years than most capital assets." Primary examples of infrastructure assets are roads, bridges, tunnels, drainage systems, water and sewer systems, dams, and lighting systems. Buildings are not included unless they are a supplementary part of an infrastructure network

The effective date for complying with GASB 34 is divided into two stages and is dependent upon a government's total annual revenues. The first stage is prospective and deals with the reporting

of "newly acquired general infrastructure assets." The second stage is retroactive and covers the existing major infrastructure assets acquired, renovated, restored, or improved since June 30, 1980. Retroactive reporting requirements take effect four years after the implementation of the prospective information. For governments with $100 million or more in annual revenues, the effective date for prospective reporting is the fiscal year beginning after June 15, 2001, with an effective date for retroactive reporting the fiscal year beginning after June 15, 2005. For governments with $10 million to $100 million in total annual revenues, the effective dates are the fiscal years beginning after June 15, 2002, and June 15, 2006, respectively. For governments with less than $100 million in total annual revenues, the effective date for prospective reporting is the fiscal year beginning after June 15, 2003, with an effective date for retroactive reporting not required, though strongly encouraged.

Due to the nature of infrastructure assets, the Modified Approach was established as an alternative to depreciation in asset reporting. Although the decision of which reporting method used is left to individual governments, the Modified Approach is seen as the more cost-effective alternative. Depreciation expense may be less costly to implement, but it does not reflect the importance and financial benefits of preventative maintenance. Also, use of depreciation expense may indicate a municipality is irresponsibly allowing major assets to deteriorate. The Modified Approach presents a more accurate representation of what state and local governments are doing to maintain infrastructure assets, but it implies major issues in documentation, assumptions, and methodologies. GASB 34 does not specify methods or standards for reporting with the Modified Approach, but extensive documentation and consistent valuation methods are required each year.

These requirements represent considerable resource implications in terms of internal support systems, personnel, and technical support services. Municipalities will have to determine types of depreciation to be used, alternate between and use different types of depreciation in a single accounting period, and accurately represent the value of both historical and newly acquired infrastructure assets. Possibly the most important aspect of a new financial report will be the complete description of all assumptions made and methodologies used in asset reporting to help users understand the accounting results from year to year.

Three major steps to implementation have been suggested following system and requirements analysis and the development of documentation and reporting standards. First, municipalities must develop inventory and valuation abilities through the assessment of current records and existing assets. Second, asset management abilities must be developed through the development of measurement methods and the implementation of asset management systems. Third, financial management abilities must be developed through the assessment of depreciation methods to be used and necessary enhancements to existing financial management systems.

The key to accurate and complete reporting seems to lie in two things: the development of complete documentation and consistent methodologies, and the implementation of extensive management systems. And while the documentation and methodologies may vary from government to government, important system components have been identified. These include: asset inventory databases linked to GIS, pavement management systems, bridge management systems, maintenance management systems, and financial management systems.

The substantial resources needed to implement GASB 34 concerns all state and local governments. While many states, (e.g., New York, Washington, Pennsylvania,) have already been focusing on the importance of asset maintenance and preservation, the reporting standards will present a challenge in system design and implementation. With Y2K behind us, resources that were dedicated to dealing with that problem could be reallocated to the GASB 34 issue.

CONCLUSION

We believe the interesting strategic and creative use of IT in municipalities has been under-reported. System integration, GIS, and other applications of IT create challenges and opportunities unique to local governments. The GASB 34 challenge, in particular, seems to demand smart and creative application of IT. We intend to investigate this interesting opportunity further.

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