Strategic Information Technology Management: The City of Anaheim Technological Initiatives

Keith Schildt, Ph.D.
University of La Verne
schildtk@ulv.edu

Suzanne Beaumaster, Ph.D.
University of La Verne
beaumast@ulv.edu

Abstract

This paper reports the findings of an exploratory study investigating the role of IT in a municipal-owned and operated public utility. Through the use of case study methodology, the paper finds a confluence of contextual factors fostering changes in an IT management strategy aimed at increasing efficiency and effectiveness of service delivery and improving customer/citizen satisfaction. These factors include changes in the regulatory policy environment, advances in technology, increasing citizen and customer knowledge and sophistication about IT, and managerial and elected official commitment to an IT strategy. The paper begins by proposing a model of the IT strategic planning process that occurs in municipal environments and then details several IT initiatives of the municipality in relation to the proposed model. The study finds that the complex nature of technology and its financial risk due to quick obsolescence poses political risks for the organization attempting to manage the IT infrastructure, which changes at a far faster pace than the organization's other types of infrastructure. The strategic management of IT must take into account the differing value sets among its organizational and political members and how these differing motivations impact the management of the IT infrastructure.

1. Introduction

The truth of the simple phrase "information is power" has been proven repeatedly over time. In a world where this is true, the public sector should stand in good stead. Public organizations in particular have more information about people, property, and administrative processes than probably exists anywhere else in the world. Currently, public organizations have an overabundance of a resource, which shows no sign of diminishing in the foreseeable future. While it's one thing to have a resource and the potential power it brings, it is an entirely different matter to make effective use of that resource through management, control, and foresight. How organizations control, process, and disseminate information and how they manage the technologies associated with it as the information/technological age progresses is critical.

Strategic management of information technologies is an involved and complicated endeavor, and becomes more so with each new innovation. It is no longer enough to simply automate clerical tasks or transfer reams of data into a computer. Today's technologically savvy organization must make use of integrated information systems, which will not only allow them to process data and perform clerical tasks but also provide services in a more effective and user-friendly way. Integrated municipal information systems can offer better ways to provide for government administration and service deliveries but getting there is no easy matter.

A good deal of attention has been paid to the rapid change in information technology and its management in the public sector. In recent years, public administrators have realized that they must manage information technology in terms of the impact it has on the employees using the technology and the organization as a whole. Information technology is no longer being viewed as simply a way to increase efficiency but as a way to bring about organizational change. IT has moved from a means of gathering and processing data to a way of strategically managing organizational processes and outcomes.

The environment in which public administrators operate is on one hand a dynamic one, one that is being driven by technology and therefore prone to rapid change. On the other hand, the public administrator exists in an organizational environment within a political context, which is not very amenable to rapid change. The strategic management of IT in the public sector thus is at the confluence of competing motivations and values regarding change. IT and its strategic management confront public administrators with three strategic concerns. First, the fast pace at

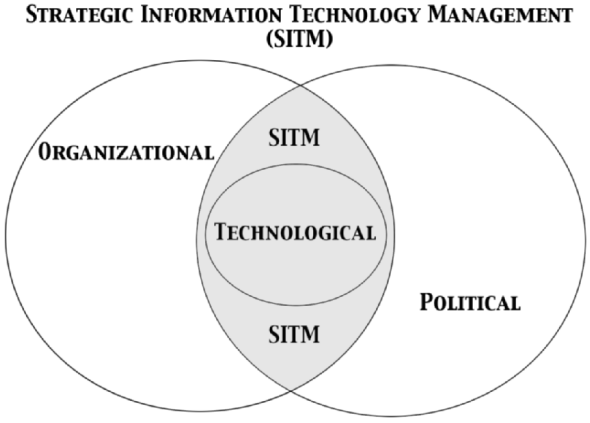
which the information technology used in this sector is changing forces public sector managers to keep abreast of the changes and decide which, if any, should be incorporated into their organization. Second, information management is a major change agent in and of itself and has potential impacts on organizational structure, human resource management, and fiscal administration. Third, public administration is in the midst of a major change with its increased usage of a governance framework as opposed to a governmental framework, which places a greater emphasis on information management and the communication of information intra and inter-organizationally—primarily a function of the privatization of public services and the "hollowing out" effect this has on government.

This paper explores, through a case study design, strategic information technology management in a municipally owned public utility system in the city of Anaheim, California. This exploratory research is based primarily on a series of iterative semi-structured interviews with four senior management representatives of the municipality as well as archival data and secondary data analyses. The aim of this exploratory case study was to develop a preliminary model of IT strategic management that incorporates the technological realm within a political and bureaucratic context utilizing an open systems framework. Towards this end, the interviews were guided by an inventory of IT and strategic planning issues relating to IT changes that have recently occurred in the organization, the impact these changes had on organizational decision making, what facilitated the new technologies being adopted or considered, the barriers that were overcome in implementing these changes, and the roles played by the city manager's office and the city council. As the interviews occurred, the interviewees themselves pointed out additional issues and details of the organizational change process (e.g., the important role business and economic development plays in IT strategic management). In other words, rather than relying on a predetermined set of structured questions the interviews were framed around issues and the interviewees were prompted or focused towards these issues but were free to express tangential opinions and information.

The paper begins with an introduction of the model components, a review of strategic planning principles, a description of the municipality's utility department's operation, and then details the strategic management of IT in the public utility department by describing recent changes in the department's technological resources and its impact on the management of the utility system in light of the model's analytic framework. The paper concludes with a summary of the findings, recommendations for successful strategic ITM planning in the public sector, and suggestions for future research.

2. ITM Strategic Management Model

Public sector ITM systems occur at the convergence of three interrelated streams of values and activities. The first stream contains political processes, which tend to be controlled oriented and generally distributive in nature. The second stream contains organizational (bureaucratic) processes, which tend to be stability oriented and generally procedural in nature. The third stream contains technological processes, which tend to be change oriented and catalytic in nature. These processes are embedded and operate within a socio-economic context that acts to establish the parameters of the ITM system's operation. The interaction between what is politically viable, organizationally feasible, and technologically possible provides for a dynamic ITM situation. Figure 1 depicts the analytic model of the three streams.



[Figure 1. Strategic information technology management model]

These three streams create an operational environment that is extremely complex and highly problematic with regards to overall organizational operations. In essence, the technological element of SITM is typically very different than the political element. From the standpoint of IT, "the train has left the station" while the political systems are much slower to change. Meanwhile the organizational perspective must mitigate these two often-opposing forces. Within this scenario, the public administrator finds himself at a bottleneck of sorts, continually

balancing the needs of the citizenry as expressed through the politicians while still addressing the timeliness and process requirements of technology management. In the end, efficiency and effectiveness is substantially different technologically than they are politically.

3. Strategic Planning

Often used interchangeably, strategic planning refers to the development of a course of action and strategic management in the implementation of those plans. Over the course of the last decade public organizations have increasingly made use of the process of strategic planning. It should be noted that strategic planning arose out of the private sector as a process designed to minimize risks and maximize profits, by "establishing formal planning systems to replace, older, informal, intuitive methods" [8]. Overall, the process is one of strategic analysis followed by the formulation of strategies to better position in the organization and culminating in the implementation of those strategies.

Bryson [5] defines strategic planning as a set of concepts, procedures, and tools that shapes and guides organizational decision-making. Strategic planning differs from long range organizational planning. Long range planning is based on the premise that the organization's future will be similar to its current state. Strategic planning assumes the opposite will occur. The future will probably differ from the current state in important ways.

The typical strategic planning process found in the public administration [5, 14] and business [7, 11] literature involves an analysis of the past and present organizational operations, which provides a roadmap, of sorts, for future organizational decision-making. Therefore, the strategic planning process involves a review of what the organization has accomplished (and failed to accomplish) in the past, what it is currently doing in the present, and an internal analysis of the organization's strengths and weaknesses. Then the analysis shifts externally and becomes more future-oriented by examining potential opportunities and threats that are in the organization's environment. This process culminates in an identification of key strategic issues and a set of action plans designed to guide the organization to some future state. Although usually presented in a linear, sequential fashion in the planning literature, the actual practice of strategic planning is much more iterative and dynamic.

While formal strategic planning is not, "a panacea for resolving organizational or community conflicts" it should produce the following results: an organizational mission statement; an environmental scan with a three to five year horizon; basic long-term goals and basic one year goals; strategies and steps for action to move the organization toward set goals; and, finally, implementation plans with assigned responsibilities for action [8]. Above all, strategic planning should not be regarded as the end point or an unalterable product. It should not fail to question preconceived notions or assumptions before adding or incorporating into the plan. Gaining organizational commitment is important, but not adopting wrong or impossible to implement goals should also be stressed. According to Gordon, "in order for strategic planning to be effective, it must be fully accepted at the senior-most levels and integrated into the local government organization as both a product and a process" (Ibid).

Strategic planning takes on some new characteristics when viewed in the context of the management of information technology. Information technology planning differs from the standard planning process due to a number of factors: IT planning must generally be oriented on the budget year as opposed to a more strategic 3-6 year horizon; much of the focus of IT planning is directed toward the organization as opposed to citizen or customer usage; IT strategic planning focuses on the technologies themselves as opposed to solutions to organizational problems; and, finally, IT strategic planning must focus on incremental changes. [1]

Additionally, the strategic management of information technology must take into account the evolution of how public organizations have dealt with IT over time**.** Holden, [10] in reviewing the evolution of ITM in the public administration literature finds three primary stages of ITM development in the public sector. The stages differ in their emphasis from one of the physical management of technology (Stage 1) to a shift of the management of the information content (Stage 2) and finally an emphasis on maximizing the knowledge contained in the information (Stage 3). These changes reflect the movement of IT from a centralized backroom, mainframe operation to a decentralized, desktop application throughout the organization. That evolution of information resources has necessitated changes in the management of human resources (e.g., training protocol, recruitment and selection criteria) and fiscal resources (e.g., forecasting costs associated with upgrades and technological obsolescence) and therefore greatly impacts strategic planning.

The relationship of information technology and strategic planning essentially developed out of two trends, which occurred in the 1960s and 1970s. The first of these trends began in the early 1960s with the push for a single integrated approach to MIS, which could be used across entire organizations. It soon

became apparent that this approach was insufficient due to the complexities inherent in the process of managing IT across multiple levels of organizations. By the late 1970s, an approach that integrated separate but interrelated information systems throughout the organization became the norm, especially for larger organizations. This approach developed into a second trend, which still exists in organizations today—that is, information systems interwoven into the management processes of the organization. With this trend comes recognition of the pressing need for long range planning with regard to information systems and the activities of MIS departments. This direction also speaks to the importance of interrelating long range IT plans with the comprehensive corporate planning subsystems. Current IT planning trends recognize that each strategic plan is unique to the specific characteristics of each individual organization. In addition they must be equipped to cope with the fact that system changes are inevitable and for that reason, the strategic plan must be flexible.

IT planning may be viewed as a conjunction of two perspectives: range of time—referring to short, medium, and long term planning; and focus—relating to the principal concerns of the plan which may be strategic, managerial, or operational. Strategic planning for information management is critical in order to ensure that the role played by information systems will be congruent with that of the organization as a whole.

Information technologies and their applications for organizations have evolved exponentially over the last 30 years, essentially becoming an integral and imperative part of all organization processes. The symbiotic nature of IT and organizational operations necessitates the increased involvement of all levels of management in the IT planning process. No longer is it acceptable or suggested to leave total discretion over key IT decisions to an IT department or individual IT specialist—its impact on the organization is too great. According to Ward the more dependent that an organization becomes on IT "the more centralized and structured the approach to planning and control should become" [16]. This does not mean that IT planning should be exclusively the domain of top management, on the contrary, the facilitation of IT innovation and effective use demands the participation of users at all levels of the organization in the planning process. Sullivan [15] describes this situation and calls for a complex but balanced set of management approaches—referring to this as "eclectic IT management". Essentially, Sullivan's eclectic management approach is a prescription for IT planning processes that are tailored to the specialized and individual circumstances, which are determined by the industry of a given organization and it's particular organizational culture.

By the late 1980's, organizations across the board were recognizing the need for strategic plans specific to information technology implementation. An early study conducted by Lederer and Mendelow [12] reviewed 20 private sector organizations in an attempt to determine the problems senior management was having with regard to the development and implementation of IT strategic plans. In their study the researchers found five reasons for the problems that were occurring with IT planning: (1) managers tended to view IT as operational tools and did not recognize their impact on the organization; (2) managers perceived a gap between industry claims of what IT could do and the difficulties of their organizations in duplicating those claims; (3) managers tended to view IT as critical to the organization only when it impacted their needs for information or services—otherwise they failed to see their facility as a resource; (4) managers constantly focused on financial justification for IT investments; (5) finally, top management had become increasingly action-oriented with a short-term focus to the detriment of long-term planning especially for IT.

Strategic planning is an important process for any organization, regardless of its ultimate goals. The benefits of this kind of planning include: more effective strategies for current and future operations, clear and concise priorities for the expenditure of scarce resources, a high probability of improved decision making based on learned information from the process, improved management of change, a clearer picture of possible consequences, and overall increased performance of the organization. In the end, strategic planning provides a framework for understanding and addressing complex issues in a particular organizational context.

4. Technological Change

The nature of technology plays a key role when viewed in the context of strategic planning for IT. Information technology, in essence, is constantly evolving—one of the difficulties is that it does so quite rapidly—making it very difficult to get a handle on. Technology by its very nature is in constant flux. New developments are steadily replacing or enhancing previous innovations. The whole reason for the existence of information technologies is to make continual improvements in the way we communicate and function. Change and constant design improvements drive technology and the timeline is very short. The window for opportunity on the new and innovative is extremely short. In another sense, IT is self perpetuating—constantly generating needs for

new hardware, software, and systems. The nature of technology, then, has serious ramifications for long range strategic planning. The primary dilemma being: How does an organization plan for the constantly changing and often unknown future of information technologies?

Rapidly changing technology is problematic for IT strategic management in the same way it is for the planning process. The crux with regard to this process is the inevitable time lag between planning for IT and actual implementation. A typical strategic plan runs the course of a 3-5 year timeline. This is an eternity in technological terms—new, major developments in IT may occur in 8-12 months. By the time planned-for technologies are actually introduced in the organization, they may be well into their obsolescence. This creates problems not just for physical hardware and software implementation but also for the human side of the process—this issue has a significant impact on training, individual expertise levels, and individual resistance levels. Resistance to change is particularly problematic with regard to any discussion of information technology. One of the biggest roadblocks in this area is that information technologies often represent completely new—in some instances global—changes for the organization and its individuals. Human beings typically reach a certain comfort level with regard to their abilities and work processes. For most people new technologies represent a daunting learning curve and possible downsizing of their jobs. This perception introduces fear into the process and creates significant resistance to change. Changes as simple as a microcomputer upgrade can cause serious backlash from resistant end users.

A public sector organization is faced with another obstacle/challenge with regard to IT planning: the nature of the political process. Political processes are resistant to change by their very nature. This predisposes a new system to serious backlash if implementation is not carefully planned.

5. The Case of the Anaheim Utility Department

Anaheim is a unique city, constantly changing to meet the needs of citizens, businesses, and millions of yearly visitors. In this environment the Anaheim Public Utilities Department serves electricity and water to the municipality's approximately 328,000 residents and 15,000 businesses. It is located in Orange County and is the County's only customer-owned, not-for-profit electric and water utility. The department relies solely on retail sales for its revenue and is described as an enterprise fund in the municipality's fiscal administration, which implies that it's intended to function more like a private enterprise than a public entity (at least in terms of generally accepted accounting standards).

The department's mission statement reads: "The Public Utilities Department is committed to adding value to the community through a customer-focused approach to providing reliable, high quality water and power at competitive rates". The department's goals are to:

- Provide a safe work environment for all employees.
- Operate and produce water and power in a manner that ensures public safety.
- Enhance service delivery and service options.
- Retain and attract customers.
- Enhance community goodwill.
- Use assets to produce maximum benefits at minimum cost.
- Improve/maintain credit ratings.
- Strengthen the water and power systems.
- Improve internal communication.

Anaheim has a well-developed set of objective regarding both the electric and water utilities. Orange County and the City of Anaheim in particular have proven to be proactive in their approaches to governance, which made the City ideal for this particular study.

In the course of their initial planning process existing technology based projects were evaluated and a number of recommendations were made for IT related changes. The following projects were specific to the public utilities department:

- Document Imagery—image over 750,000 documents up to 40 years old, including 48,500 maps.
- Enhance document scanning capability.
- Expand advanced metering system to include new options for residential and small business customers.
- Review and expand interactive internet services.
- Upgrade all existing systems to enhance communications capabilities.
- Convert all department users from a UCAF1 server to a new file and print server.
- Apply new forms to the intranet.
- Establish MS project server and set up project management tool at the server level.

It soon became obvious to the administration that the utility could not adequately conduct the IT strategic planning process due to the complexity of the projects. The task of modeling the IT challenge was contracted out. From the perspective of the SMIT model presented previously, this outsourcing represents

concerns for both the political and organizational streams. Contracting out may certainly meet the needs of the organization but it also creates a lack of ownership in the process and some dependency on external providers. In the end, significant concerns may arise for the policy body. In addition, the need for constant re-evaluation by outside firms presents a difficult political problem and raising unpalatable questions of costs/benefits. If an attempt is made to provide in-house analysis a tug of war between the organizational sphere and the political sphere may erupt as ensuing results are not trusted and outside validation is requested.

In the case of the public utility department, the organization truly was significantly behind in their ability to manage data. In order to support the outsourced work—it took hundreds of hours for utility personnel to accumulate the data needed.

A second area that warranted specific address was the financial plan for IT implementation. As the utility engaged in detailed capital and expense projections, managers found themselves "penciling in" what they perceived to be necessary IT modifications and projects. This approach had a fragmentary affect on the IT planning process. In this way, the overall vision suffered as individual managers determined what was needed for their particular projects without maintaining a focus on the needs of the entire department.

Looking at this through the perspective of the model—it is clear that IT had not been sufficiently integrated into the organizational decision making scheme. This has significant implications for the organization as centralization is lost, overspecialization may lead to expensive legacy systems, redundancy, and limited flexibility. In this way the technological sphere is in conflict with the organizational sphere as limited resources are poorly managed and organizational vision is lost.

As the IT planning process progressed the public utilities department found itself in need of centralized goals under which to place the specific needs of each distinct unit. Following are the discrete areas that were developed:

- Data warehousing capability to facilitate data analysis and reporting.
- Automation of current manual tasks in order to improve the quality of decision making and reduce personnel costs.
- Improve internal networking to provide easy access to information across the utilities department and the City.
- Flexible and responsive customer service options.
- Improved responsiveness to internal and external stakeholders.

By creating a shared set of needs, the utility has a better chance of mitigating the conflict between organizational and technological spheres.

5.1. IT Initiatives

The Anaheim Public Utility Department has made numerous changes to how it manages information and utilizes that information in providing electric and water services to its customers. Anaheim's primary goal has been to successfully achieve a balancing act—which meets the challenges created by a variety of political, organizational, and technical barriers, while simultaneously avoiding the pitfalls associated with IT management. This section of the paper will first review some of those changes and then place them within the context of the Strategic IT Management model presented earlier.

System Control and Data Acquisition (SCADA) - automating the power system.

This project has been purposively, slowly implemented over approximately the last four years. It reflects an organizational response to the political environment. In this particular municipality—as with many others—information technology often proves to be a tough sell for administrators. In most cases technological advances are difficult to see, they exist behind a screen of administrative process. By comparison, a fire truck is easily visualized, its impact on the community and usability to the citizen is much more apparent. In reality it is much more attachable to a given political agenda. Although a tough sell for administrators—an incremental approach to implementation of SCADA appeased wary political figures.

SCADA is an attempt to automate the electric substations and the water wells and pumping stations. The automation includes the ability to read voltages and water pressure, switching capabilities, and data transmission in order to do forecasting and to facilitate the identification of problem areas proactively so that preventative maintenance can occur rather than the former—reactive mode (i.e., waiting for something to break and then fix it).

As explained by one of the interviewees, "rather than try and sell some large multimillion dollar automation project, we bring it on using more of a piecemeal basis—this probably reflects the difficulty in selling large projects and their associated costs inside a municipal governance structure". Indeed, changes were made incrementally by first automating the relays, then certain disconnecting devices, then finally updating the CPUs for the SCADA system overall. As technology changes over this implementation process, advances are incorporated into the overall automation

program, or as one employee phrased it: "It's kind of like painting the Golden Gate Bridge—by the time we get it all done, we're starting over at the other end again."

As a part of the new SCADA system the department extended a local area network (LAN) to each substation. They then connected the LANs via a looped and routed wide area network (WAN). This work was completed in 2000 and was required to support the new substation and distribution automation programs. The SCADA WAN also facilitates and allows for more advanced substation applications including, remote event report gathering from digital relays, much higher data transports, faster testing and troubleshooting, and other network related activities. With the installation of the SCADA WAN they were also able to support Ethernet based video cameras for substation security and piloted this security system at one of the substations. These cameras are controlled (e.g., pan, tilt, zoom) via a simple browser, and the video data is saved to one of the SCADA servers for archiving.

The logic behind this particular initiative is to do more with less. The more remote monitoring and control the department can establish over the power system, the fewer bodies (and related labor expenses) the department needs to operate it. Secondly, the more remote control, the less time it takes to energize alternate sources of power, and therefore, customers are without power for less time.

The department has been using some form of a SCADA System for the utility's electric system since the early 1980's. Since then the electric SCADA system has gone through three major upgrades; the original system was mainframe based, then the mainframe based changed to a minicomputer (real time operating system) based; and finally to a UNIX (HP-UX) server/workstation based system. The reason for the changes each time were based on the amount of data points the old systems could handle, as well as obsolesce and manufacturer support of the old equipment. The latest major system upgrade (minicomputer to UNIX based) occurred in 1998. This upgrade was required to support distribution and substation automation, which represented a 100-fold increase in data points, as well as, the relocation of the control center. The old system could not be relocated to and could not operate in an online/standby mode separated by a large, physical distance (the source for this information was archival data supplied by the department).

Similar technology-driven changes occurred in the water distribution system. Water system substation automation began in 1999 and there are currently two substations using this system. Substation automation encompasses the integration of the new, advanced digital relays, meter, and other equipment inside the substation. The system includes a SCADA workstation (Unix based), networking equipment, GPS, and data concentrators. This system enables the SCADA system to gather a greater number of alarms, data, and other operating parameters for more efficient operation of the electric system. This new data facilitates faster switching and sectionalizing during system disturbances and outages.

The substation automation system allowed for further technological development for automating the distribution processes. Distribution automation projects include automating underground and overhead switches, capacitor banks, fault indicators, and other distribution equipment. The system drastically reduces the amount of time to sectionalize and troubleshoot outages, thus reducing the amount of time a customer experiences a power outage. Currently, 50 overhead switches and 15 underground switches are remote controlled and monitored via SCADA; another 20 automated overhead switches are in construction; and 80 automated overhead switches are out to bid. The automation of distribution switches (underground and overhead) is expected to continue for the next 5 to 10 years depending on staffing and funding (source: intra-office department memorandum).

Inventory Bar Code Program

In January 2001, the departments utilized an outside consultant to "come in and map out a few work processes" and make some suggestions for necessary changes in the $8,000,000 inventory system. The system then in place was paper-based and it was suggested that it be shifted to a bar coded, wireless process. The potential savings helped move the proposal through the city council and gain its approval. The interviewees were quick to point out that council members are usually not interested in technological change per se but need to be convinced that these changes will bring about increased operating efficiencies. It is not their inclination to make changes that are only internally seen and therefore not visible to the electorate that votes them into (and out of) office. It appears that technological change is a tougher sell than a new fire station.

Wireless Meter reading

Anaheim has embarked on a long term, real-time metering strategy, which entails covering its entire customer base with wireless technology. The ultimate goal of this initiative is to provide the department with the ability to remotely read electrical meters and ascertain the quality of the power delivered. The department is using an incremental approach. Step one identifies large commercial and industrial users and then begins the process of installing Siemens wireless

technology at each location. The second step movies to the smaller scale—medium sized commercial and industrial customers. As of April 2003, the department has supplied access to 66% of its 334 large commercial base and 96% of its 4,440 medium-sized commercial customer base with wireless ready technology. The final stage of the process targets the residential customer base. At this time, the residential program is operating as a pilot test program. The goal for this stage is to determine the viability and usefulness of wireless residential services.

Communications: 800 MHz radio and Blackberries

The Utility Department recently made some changes to how the employees communicate with each other and other departments within the municipality. In explaining the change to a 800 MHz radio system one interviewee colorfully summed it up by stating, "Our low band stuff was crapping out and had lots of dead spots. The argument that we wanted to be consistent with County-wide systems carried the day here. Now, in Orange County, theoretically the head of County Emergency Operations could talk to an Anaheim pipe fitter if he had a mind to, as well as Police, Fire, etc".

Apparently, the high band radios used by Electric employees and the low band radios used by Water employees had suffered from equipment obsolescence and interference by other users. Following review and analysis of several options for a new voice dispatch radio system, the Utilities Department developed plans to proceed with full deployment of the County-wide 800 MHz radio system. The change was phased in and completed over a two-year period starting with handheld radios and then fixed-base radios.

The second communication change deals with the use of Blackberries. An interviewee eloquently summed this change as follows:

"We stole the idea of Blackberries from a Fleet Manager who was tired of always losing the stylus on his Palm Pilot. (great ideas always have humble beginnings.) As Blackberries promulgated across the City, we decided to use them as the basis for an emergency alert system. The ENS system (Emergency Notification System) sends out an email message to about 100-150 people in the City (Police, Fire, Utilities, City Admin) for large-scale events. This way, we all know close to the same time, when trains jump the track, planes land on the freeway, four alarm fires break out, bank robberies or big power outages occur, etc. Then, the executive team either meets "on the pink" (an 800 MHz frequency designated for Anaheim managers) or we meet on a pre-established conference call bridge number, or (if things are really dim) we use our satellite phones. Each of our emergency operations centers (Fire, Police, Utilities) has satellite phone capability as well. The Blackberries really help in that we have initial information quickly and can forward it."

Kiosks

Government agencies are constantly on the lookout for technologies that will enhance service delivery and facilitate citizen—agency interaction. By the late 1980's kiosks were heralded as one of the more promising information technologies for use by the public sector. Since their inception, kiosks have seen mixed results as a technological solution. The city of Anaheim was hopeful that kiosks would provide a viable information and service option and thus decided on a multi-use program for the utilities department. This project started in 2002 and it was implemented primarily to see if water and electric customers would use a remote payment opportunity.

The results of the kiosks use in Anaheim were mixed. One of the most common occurrences was that the technology was at best, underutilized. In the words of one interviewee:

"The twist appears to be that customers who are computer literate use their home or work computers. Our "walk-in" customers are largely low income, and many don't even use checks or credit cards, let alone look favorably upon a computerized kiosk. I was hopeful that the other features might be a draw to the public (e.g. you can find, as well as interact, with other departments, you can look at live traffic cams, you can search the City's website and look for jobs, etc.) but thus far, it's not going very well. Could be a placement issue, could be people asking why, if they wanted to talk to Customer Service, they would call from immediately outside the Customer Service office rather than go in. Could be that the Kiosks don't take money—that's my vote for the less than stellar utilization".

While not all of the technology-based initiatives have proven to be unquestionably successful, objectives are being met.

6. Conclusions

At this point in time there is the concern for technological risk and the forces driving change. The model presented in this paper places public sector organizations in a configuration that must manage its IT through a balancing of organizational and political realities. At the same time, the organization is faced with internal and external forces that drive change and this change must mesh with the political process of government. Some of these forces are technological in nature others are demographic and part of the social culture that comprises the Utility Department

environment. In the case of Anaheim, the internal and external driving forces include the following:

1. The city has an expressed desire to coordinate the Utility Department's service delivery with the other operating departments in the city (e.g., Fire and Police) in order to provide safe and efficient services. This was one of the motivations behind the change in communications to an 800 MHz radio system and the use of Blackberries.
2. The city has a goal for "one-stop shopping" for municipal services. For example, the current process for building permits requires not just citizen/customer interaction with Building Department but separately with Planning, Utilities, and, in some cases, Fire.
3. In conjunction with #2, the need to capture revenue streams and be assured that all revenue associated with these multiple contact points are collected and accounted for properly.
4. Demographically, the employee base of the Utility Department is comprised of approximately 25% "well degreed" individuals and their knowledge, skills, and abilities fosters a desire for technological advances. At the same time, the external demographics of Anaheim has seen an increase in its Hispanic population in the older parts of town and an influx of affluent population in the newer parts of town.
5. The need to establish a clear identify for the department in the customer base. The department suffers from a lack of recognition by customers/citizens that it is a public sector entity within the municipal government structure distinct from private sector providers (e.g., Southern California Edison).
6. The increasing economic development and redevelopment activities in the city has been mainly in the high tech industry and that comes with an expectation by these commercial and industrial customers of an equally technologically proficient municipal operation.
7. The highly Libertarian political culture of Orange County means that municipal operations are expected to run like a business.

These forces converge and make IT planning and its management a complex task in a public utility department. The complexity is made worse by the very nature of technology. The nature of technology includes an implied financial risk due to its quick obsolescence. Technological risk refers to and describes the differences in life span between the "typical" or traditional infrastructure of utility operations (e.g., piping, wires, valves), which usually have 25-30 year life spans, and the relatively short life span of IT, usually measured in months not years.

An element related to technological risk is the concept of "stranded capital". The nature of technology with its rapid change and therefore obsolescence poses a problem because there is a lack of guarantee that the technology will be useful in the near future. The roll out of a IT project may be implemented over a number of years and questions arise not only whether the technology will still be useful at the end of the roll out but additionally whether the organization can find a vendor to maintain the technology after full implementation. It is organizational costly and politically hazardous to venture down a technological path only to find that half way through the implementation that less costly technological advances have been created or that vendors are no longer servicing that particular program or piece of hardware and that the organization spent scarce fiscal resources on an ineffective, inefficient project.

7. References

[1] Boar, Bernard H. (1993) The Art of Strategic Planning for Information Technology: Crafting Strategy for the 90's. New York, NY: John Wiley & Sons, Inc.

[2] Bozeman, Barry and Stuart Bretschneider, 1986. "*Public Management Information Systems: Theory and Prescription*." Public Administration Review, vol. 46 (Special Issue), pp. 475-487.

[3] Braithwaite, Timothy (1996) The Power of IT: Maximizing Your Technology Investments. Milwaukee, WI: ASQC Quality Press. (p.40)

[4] Bretschneider, Stuart, 1990. "*Management Information Systems in Public and Private Organizations: An Empirical Test*." Public Administration Review, vol. 50 (September/October), pp. 536-545.

[5] Bryson, John. 1995. Strategic Planning for Public and Nonprofit Organizations. San Francisco, CA: Jossey-Bass.

[6] Byrd, T.A., Sambamurthy, V., and Zmud, R.w. (1995). "*An Examination of IT Planning in a Large Diversified Public Organization*," Decision Sciences (26:1), 49-73.

[7] Goodstein, Leonard, Nolan, Timothy, and Pfeiffer, J. William (1991). Applied Strategic Planning: A Comprehensive Guide. New York: McGraw-Hill.

[8] Gordon, Gerald L. (1993). Strategic Planning for Local Government. Washington, D.C.: ICMA. p.1.

[9] Tat-Kei Ho, Alfred (2002). *Reinventing local governments and the E-government initiative.* Public Administration Review, Washington; Jul/Aug 2002; Vol. 62, Iss. 4; pg. 434, 11 pgs

[10] Holden, Stephen (2003) "*The Evolution of Information Technology management at the Federal Level: Implications*

for Public Administration" in Garson, G. David (ed). Public Information technology: Policy and Management Issues. Hershey, PA: Idea group Publishing.
[11] Kaufman, Roger (1992). Strategic Planning Plus: An Organizational Guide. Newbury park, CA: Sage Publications
[12] Lederer, A. L., and Mendelow, A. L. (1988) "*Convincing Top Management of the Strategic Potential of Information Systems*", *MIS Quarterly* December.
[13] Newcomer, Kathryn E. and Caudle, Sharon L., (1991) "*Evaluating Public Sector Information Systems: More Than Meets The Eye*. Public Administration Review, vol. 51 (September/October), p. 377.
[14] Nutt, Paul and Backoff, Robert (1992). Strategic Management of Public and Third Sector Organizations. San Francisco, CA: Jossey-Bass.
[15] Sullivan, C. H. (1985) "*Systems Planning in the Information Age*". Sloan Management Review Winter.
[16] Ward, John (1995). Principals of Information Systems Management. New York, NY: Routledge. p. 30
[17] Winklhofer, Heidemarie (2002) *"Information systems project management during organizational change".* Engineering Management Journal, Rolla; Jun 2002; Vol. 14, Iss. 2; pg. 33, 5 pgs.