

Preface

Over the past two decades, governmental information systems have changed from being a relatively unimportant “back office” function to a crucial element in making governmental organizations more accountable, efficient, and effective. Prior to the revolutions brought on by personal computers and the Internet, most government employees, including top managers, gave little attention to computerized information systems. Information systems were primarily used for routine reports and transactions such as payroll and utility billing. Now information technology is viewed as a major asset that needs to be actively managed. Information technology (IT) has become integral to the jobs of most employees and now is used by citizens through e-government. Consequently, it is incumbent on governmental managers to understand how to build and maintain information systems that are responsive to their users — both internal and external. It is my thesis that generalist managers and end users must play an active role in the planning and implementation of these systems for these systems to be responsive. They must not leave IT to the technicians.

There is a substantial literature on information management aimed at managers in the private sector. There are very few such books that concentrate on public sector information systems. Why not just have managers apply the same principles as employed in the private sector? Why is it necessary to develop a book for governmental managers? Although public and private organizations use much the same hardware and software, there are important differences concerning the goals and purposes of these systems that influence every aspect of computing, from planning to evaluation. Consequently, we need a book devoted to governmental information system management. This book will help provide generalist managers with an overview of governmental information management. It will also assist IT managers who have strong technical backgrounds but need to better understand the governmental context.

I have built upon several bodies of knowledge in this book. First, I synthesize from the extensive bodies of research about information management in public and private sectors. Although there are important differences in information management between the public and private sectors, I also agree that the two sectors perform many of the same functions, face many similar dilemmas, and that the two sectors can learn from each other. Indeed, for the last decade, most public sector agencies have been engaged in

attempting to emulate private sector practices concerning their purchasing methods. Thus the private sector literature provides relevant guidance, although they often need to be adjusted to the governmental context. Moreover, the empirical literature on governmental information systems is limited (e.g., Kraemer & Dedrick, 1997), although there is a newly emerging body of research on certain topics, such as e-government activities. In short, we attempt to ground our observations as much as possible in information management research conducted in both the public and private sectors. Second, I have searched for detailed examples of governmental information management in practitioner-oriented magazines, as well as online sources, provided by public IT managers themselves. The speed of IT innovation and implementation leads to a situation where academic research often lags far behind the existing practices of management. Consequently, I have employed these other sources because they provide information on emerging technologies that have not been systematically studied by researchers. However, it is important to note the limitations and potential bias of these sources. The limitations include the fact that the information from these sources is often not very systematic or detailed in nature and is generally presented by someone involved in the implementation, not an independent outsider. I have found valuable sources from the Internet, resulting from the fact that many governments are now putting their plans, RFPs (Request for Proposals), and other relevant documents online. Many of these provide excellent, and often candid, insights into how they manage IT. Thirdly, I employ my own experiences of more than 20 years of studying information management in governmental organizations. I have conducted information management research at the federal, state, and local governmental levels. Several of my research projects involved case studies and interviews with a wide variety of governmental staff concerning information systems. I also employ information I have gained from listservs comprised of IT officials in government, as well as my experiences in organizations composed primarily of governmental IT directors. I have had many students who work in the governmental IT field and I make use of their experiences and insights.

To supplement and update this information, I conducted case studies of 14 governmental organizations during 2003. In these case studies, I interviewed the IT director and other IT staff, one or more members of “generalist management,” and one or more end users. In addition, I conducted interviews with others, such as consultants and vendors, who have worked extensively with governmental organizations. The total number of interviews was 51. These interviews were taped and transcribed and I have included many passages from them in this book. The interviews covered a wide range of topics. To ensure candor, the interviewees were promised complete confidentiality, and the benefits of this candor are evident in the openness of the responses that I employ, such as admitting problems and limitations they have experienced. These interviews were conducted in the Midwest but I believe that experiences in the IT field are generic. The commonality of the problems of governmental information management is reflected in the discussions I have observed in the listservs of national organizations (e.g., Government Management Information Sciences organization) — the same problems and issues appear regardless of location. In my view, qualitative research such as comparative case studies offers important insights into crucial issues. The interviews included a range of organizations in size but included many organizations that are small (averaging about 50,000 employees) in population and an IT staff of six. Smaller governments represent a large portion of public sector agencies but they are grossly underrepresented

in books and articles on governmental information systems and thus this book will be an important resource for them. Despite their small size, these organizations have to implement many of the same technologies that large organizations with large IT staffs do. Consequently, researchers need to pay more attention to organizations with limited IT staff and resources and this book fills a significant gap.

Reliance on my experiences, interviews, and qualitative case studies is necessary due to the limitations of research on governmental information systems. Although there is a growing body of literature on governmental information systems that I draw upon, this research has been focused primarily on a few areas, such as e-government and Web-related technologies. Although this research has furnished some important insights, it does not address many of the issues which I have found to be central to understanding the governments and IT, such as the critical importance of the informal system. Consequently, my interviews focus on these areas that have been lightly researched and that require “rich” information, such as observation and open-ended interviews because of their sensitive and complex nature.

Any book on information technology will quickly become dated in terms of the technical aspects that are covered. For example, just a decade ago, the use of e-mail and Web sites was rare for most organizations, and now their use is universal. By focusing on underlying management processes and issues, the information I present here will remain relevant despite changes in the specific hardware and software employed. I welcome feedback and suggestions from readers.

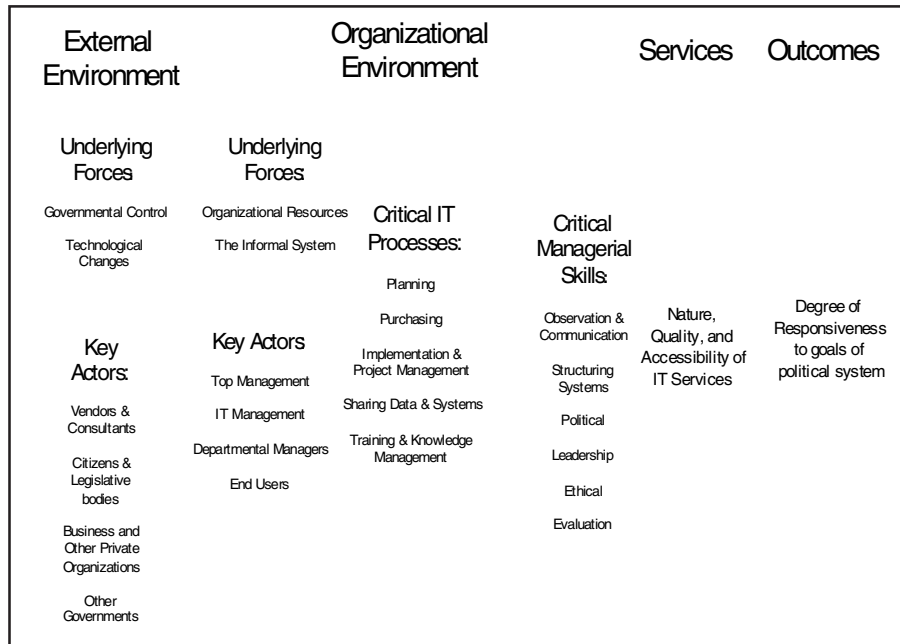
Research in information management tends to be prescriptive in nature. Works, including this one, tend to focus on developing insights into what can improve the responsiveness of governmental systems. Prescriptive advice is common in works in the IT field. Although I also do develop prescriptions in this book, I try to be cautious in doing so by basing them on more than one source of information, while at the same time making readers aware of the tentativeness of these conclusions. When I feel that there is strong evidence concerning prescriptions, I state these prescriptions. However, when there is disagreement, or I feel that there is no strong evidence for a particular approach, I prefer to state the various alternatives and not to endorse particular prescriptions. In this respect, this is not a traditional textbook in which clear sets of steps or prescriptions are given to be followed. I do not believe that the knowledge base justifies such an approach in many of the areas that are covered.

Framework for Governmental Information Management

As I have studied information systems for more than 20 years, I have continually looked for relevant frameworks and theories that will help guide my understanding of information systems. There are numerous conceptual frameworks for studying IT and they cover a myriad of variables and often are aimed at the perspective of researchers in the IT field (e.g., Ives, Hamilton, & Davis, 1980). I have borrowed from this previous work in developing my framework, but my focus is different. In the past, the interest of governmental managers in IT has been sporadic and not focused on the most important issues. Kraemer and King (1976) argue that public executives spend too much of their time on decisions concerning the purchase of equipment and too little on other impor-

tant information management issues, such as the goals of computing. Frameworks need to simplify reality and draw attention to factors that are most critical to success. Most of these frameworks have been academic in nature, as their purpose has been to guide researchers (Ives, Hamilton, & Davis, 1980). My goal here is practical, not academic. The purpose of my framework (see Figure 1) is to make generalist managers aware of the major forces, actors, processes, and managerial skills that determine how responsive information systems will be to the needs of political executives and legislators, citizens, internal staff, business and other groups. The framework distinguishes between external and internal forces. The external forces have become much more important over the last decade as governmental systems now directly serve them. In each environment, my framework alerts generalist managers to underlying factors which they need to understand if they are to identify good, achievable goals for their organization. It also identifies key actors whose interests need to be considered in making governmental IT policy. Next it identifies key IT processes in which managers need to participate if these processes are to be successful. The model depicts critical managerial skills that need to be exercised if the desired services and outcomes are to be achieved. Overall, I believe that managers can use this framework as a “roadmap” to focus their efforts on making their IT systems as responsive as possible to the full range of users. Although I have organized this book so that I focus on certain processes (e.g., purchasing, planning, training and evaluation) in particular chapters, in practice it is impossible to separate these processes — they are integrally related to one another and to various issues such as politics, leadership, and ethical issues that will appear in several of the chapters.

Figure 1. A framework for understanding governmental information management



The External Environment

The Impact of Sector: Governmental Control

In my model, I use the term “underlying factors” to refer to those forces that exert a pervasive influence over IT policy and outcomes but over which generalist managers exert little if any control. In my view, the role of sector is important. Governmental information systems have some important differences in their computing from the private for-profit sector. In particular, the goals of computing in the government sector are more complex and thus not easily translatable into hard business cases that emphasize financial outcomes and competitive advantage (Bozeman & Bretschneider, 1986; Center for Technology in Government, 1996). For example, governmental computing is subject to more stringent laws concerning access and privacy than most private data. The “customers” of governmental computing are a much broader constituency since, theoretically, all citizens have a direct investment in the systems. Although there are some forms of mild competition among general-purpose governments, such as in the area of economic development, competition is not the driving force for IT investment that it is in the private sector. Governmental IT investments are often made for service reasons. Indeed, governmental organizations tend to be externally oriented and generally freely share their “secrets” of IT success, while private sector companies will guard them if they believe they contribute to competitive advantage. Thus planning and evaluation of governmental IT systems will be quite different because non-economic goals will be more important. It is important for governmental managers not to simply assume that they can blindly copy processes and techniques taken from the private sector and expect to be successful. We will devote a chapter to a detailed comparison of public and private computing.

Technological Change

Organizations have to continually adapt to rapidly changing hardware and software. As technologies such as the use of intranets, e-mail, and the World Wide Web have become integral to everyday management, organizations have to ensure that they provide the infrastructure to ensure these crucial applications work in a timely and reliable manner. Networks become much more complex not only due to the increased number of important applications, but also due to the fact that organizations are demanding that their data be integrated. Organizations are faced with decisions as to whether they should purchase and implement new technologies such as geographic information systems (GIS), mobile computing, enterprise resource planning (ERP) systems, customer resource management (CRM), among many. As a consequence, the complexity of organizational systems today is far greater than it was two decades ago, so that even small organizations often have a complex array of servers, routers, databases, and many different and complex software technologies. Given the relatively small IT staffs that most governmental organizations have, I have wondered how these organizations cope with this rapidly changing technology. Given the fact that governments cannot make profits, they need to be able to develop a process to make reasoned decisions

about IT investments. When is it worthwhile to invest in expensive new systems or even upgrades? Managers must be engaged in understanding the potential of new technologies so they can make informed decisions. In my chapters on planning and purchasing of information technology, I will examine the processes by which organizations make decisions about new technologies.

Key Actors in the External Environment

Governmental staff must learn how to make effective use of vendors and consultants because they are major vehicles for dealing with this rapidly changing and complex technology. It is virtually impossible for internal staff to master all of the new hardware and software that governmental organizations will need to adopt. Negotiating contracts with vendors and consultants is a major challenge, but the relationship does not stop there. Vendors and consultants are essential components of the maintenance and support of governmental IT systems. Indeed, in some organizations, vendors and consultants are present so often that they become part of the organization's IT staff. Yet there is little research in the public sector on the role and impact of vendors and consultants on information management. I will give in-depth consideration to vendors and consultants in the chapter on purchasing.

The customers of governmental IT used to be primarily internal managers and employees, but the development of e-government has provided a means for governments, businesses, and citizens to conduct many operations online and consequently their influence over governmental IT has grown (Stowers, 2001). Many governments are using computer technology to provide information and services to citizens (G2C). For example, many governments use IT to automate the process of sending notices to property-owners who live near a proposed development. Likewise, citizens may now use computers to provide input to government (C2G) on rules and regulations (e.g., Mahler, 2002). Legislative bodies have always exerted control over IT projects of any size, but until recent years IT projects have tended to have low salience for them. In several chapters, including those on planning, purchasing, and politics, I will discuss the role that legislative bodies and citizens have played in information management.

Governmental organizations generally have particular groups that have a major investment in their policies and actions. For example, many governments are concerned with economic development and have created "extranets" to allow businesses (such as developers) to be served on a 24/7 basis for obtaining permits for new projects. These extranets allow governments to provide information to businesses (G2B) and to receive information from the businesses (B2G).

Many e-government services are directed at other governments (G2G), including interactions related to funding and regulations. There are many intergovernmental programs such as human services and criminal justice programs that involve federal, state and local governments. Sharing of information among governments in some cases is legally required, while in others is optional and voluntary. Many governments, particularly smaller governments, have developed shared efforts concerning technologies such as GIS that are too costly for them to undertake individually. Consequently, other governments are also "end users" and their interests need to be taken into consideration. Therefore, I have included a chapter devoted to intergovernmental information systems.

The Organizational Environment

Organizational Size and Resources

It would seem obvious that organizational size and resources have a tremendous impact on how computing is to be managed in government, but there has been little research (Note: Brudney & Selden, 1995, is one exception) devoted to studying smaller governments in empirical research or management literature on government computing. The literature that does exist concerning computing has tended to focus on large organizations such as states and major cities (e.g., Barrett & Greene, 2001). But many government agencies are small with minimal, and sometimes no, full-time professional IT staff. Yet they are faced with dealing with many of the same demands as large governmental organizations such as e-government, need for data integration, and networking. Small organizations have notable successes and have been leaders in some aspects of IT. But size and resources do influence IT administration. In these small organizations, generalist managers will need to play a substantial role not only for leadership but also for dealing with vendors and consultants and making decisions about whether to adopt expensive new technologies such as GIS. Therefore, this book will also give consideration to the dilemmas of smaller governments.

The Informal System and Non-Digital Data

A major theme of this book is that computerized and formal information system components provide only a portion of the knowledge required by decision-makers in government. A manager's information can be divided into two categories of sources: (1) Formal sources that are digitized; and (2) Informal sources that are communicated by (unrecorded) conversations and/or observations. Generalist managers need to be aware of the need to cultivate informal sources and to integrate that information with the formal, digitized system. It is clear that the role of digitized information has significantly increased over the last two decades vis-à-vis informal information. The presence of end-user tools such as spreadsheets and easy-to-use data base systems has made formal tools far more useful for everyday tasks than the data present from the mainframe days characterized by routine reports. Even more importantly, e-mail and related communication technologies allow workers to quickly share valuable information and insights with a wide range of people in similar positions.

But IT research has downplayed or ignored the role of information gathered outside the digitized system, through participant observations and other qualitative sources. Research has found that executives favor face-to-face meetings, both scheduled and unscheduled, over written media when dealing with entrepreneurial tasks and handling disturbances (McLeod & Jones, 1987). Indeed, executives rate many of the formal reports they receive as having little or no value and rated oral media (e.g., information from meetings) as the most valuable (McLeod & Jones, 1987). Part of this preference for these sources has been ascribed to the need for "*rich*" data. Daft (e.g., Daft & Wiginton, 1979) has defined richness of information as "the capacity for multiple cues and rapid feedback such as that obtained in face-to-face oral communication." Daft and other

researchers have found that managers favor the use of rich information when dealing with situations of *equivocality*. These are situations involving messages that are “ambivalent and open to multiple meanings” (Jones, Saunders, & McLeod, Jr., 1988-89; Weick, 1979), such as negotiating, bargaining, and persuasion.

An even more important issue than the concern with richness is that non-digital data can be private and this privacy is crucial to conducting many important tasks. Although tele-conferencing and other digital communication systems provide the possibility of digitizing rich data (e.g., tele-conferencing can reveal body language, inflection of voice, etc.), the fact that they are recorded makes them fundamentally different from confidential face-to-face exchanges. Participants who are aware that the information is being recorded are likely to act differently than if it were not.

The implications are important for information management because the more sensitive the topic, the more likely that informal data will play a large role. For example, we know that politics influences many governmental decisions. Yet public bureaucracies need to avoid the appearance of making decisions on the basis of politics. Consequently, it is dangerous to put politically-relevant information in print form, much less into computer systems. It is important for public officials to be able to deny that political considerations played a role in decisions even though we know that politics does influence policy. Thus much of the information used to make sensitive decisions will be gathered and discussed outside the formal, digital information system.

Such findings do not mean that computerized information is irrelevant or unused by executives. Many of those reporting to executives are heavy users of information technology and thus executives often are heavy indirect users of information technology (McLeod & Jones, 1987). Informal and formal information systems complement each other. Many of the rich data sources are cultivated by executives in order to corroborate information received from formal information sources. As managers ascend the ladder, they tend to use computers less. In summary, McKinnon and Bruns (1992) recently concluded that personal interactions remain the main vehicle for exchange of information:

“...formal reports serving mainly to reinforce orally exchanged information. There are three major modes of interpersonal communications: meetings, one-to-one interactions, and unfocused walking through the business, known as management by walking around.” (p. 124)

Preference for rich information is not restricted to executives. Although police have sophisticated information technology, the most important information to solve cases often does not reside in information systems but requires that police concentrate more on “people issues” (Laudon, 1986). Wilson has pointed out that the most valuable information is gained by talking with suspects and their associates and visiting places where they are likely to be found but there are few incentives to do this (Wilson, 1984, p. 8). The centrality of the informal system has long been recognized by public administration researchers and is prominent in Simon, Smithburg and Thompson’s (1961) text on how public organizations work. Classic studies such as Roethlisberger and Dickson’s (1939) Hawthorne Study and Blau’s *The Dynamics of Bureaucracy* showed how workers made use of the informal system (e.g., set up informal norms about quotas) to resist unwelcome threats from the formal system. Despite its significance, IT researchers have given it little emphasis in their research (Orlikowski & Barley, 2001). A complicat-

Figure 2. Manager’s personal information system

<p>Manager’s Informal Information System:</p> <p>Methods: Non-digital data gathered through qualitative sources such as:</p> <ol style="list-style-type: none"> 1. Participant Observation 2. Private, face-to-face discussions with persons <p>Advantages: Gets at information that formal system doesn’t and is used to protect employees from formal system.</p> <p>Disadvantage: May be biased, based on a partial perspective, atypical and unreliable.</p> <p>Some typical functions:</p> <p>Develop and maintain friendships and networks to provide information to protect and foster career.</p> <p>Conduct bargaining and other sensitive tasks that have a high degree of equivocality.</p>	<p><i>Interaction between Formal and Informal System:</i></p> <p><i>Compare information from both sources. If they agree, confidence is bolstered. If they disagree, seek additional information and/or put faith in one with higher credibility.</i></p>	<p>Formal Organizational Information System:</p> <p>Written reports and digitized data from memos, letters, reports, data bases, and other formal sources.</p> <p>Advantages: Ability to cover entire organization and thus be more comprehensive than data from informal sources. Also, the fact that it is formal allows it to be checked for validity and reliability.</p> <p>Disadvantages: Often does not address most important and sensitive issues.</p> <p>Some typical functions: Accountability to Internal and External sources.</p>
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ing factor is the “merger” of the two types of data. As I will discuss in my chapter on communication, many employees share sensitive and personal information via e-mail that formerly would only have been communicated through informal, non-digitized communications. However, there can be adverse consequences to the use of e-mail for sensitive purposes because these e-mails may be subject to open disclosure. The two types of data, digital and non-digital, can help to make up for the other’s gaps and distortions. I will show how knowledge gained from the informal system often helps to throw light on the biases and limitations in digital systems aimed at providing accountability, such as performance measurement systems. The challenge for managers is to gather critical information not included in the formal systems and synthesize it with that available from formal sources (while being aware of the limitations and biases present in all sources of information). Thus, in my framework (see Figure 2), a manager’s overall personal information system will be a combination of digital and non-digital inputs. The challenge for managers is to ensure that they integrate information from both sources. I will explore issues related to the informal system in all of my chapters, but particular emphasis will be given in the chapter on accountability and quality of data.

Key Actors: Whose Interest is Served?

Kraemer et al. (1989) developed a model of computing in organizations based on whose interest was served as well as which group controlled IT decision-making. Although

their model was developed in the era of mainframe computing, tensions remain among the same three groups on which they focused: top management, IT management, and departmental management.

In the Kraemer model, top management is viewed as the one group who looked at the organization from an enterprise-wide perspective. Thus Kraemer et al. refer to the situation where top management's interests dominate as the "strategic state." Of course, these top managers, both political and non-political, also have career interests, and many managers have found that innovation in IT is one of the best ways to achieve positive recognition and career advancement. In other cases, top managers are disengaged from computing. I will study the role of top management in IT decision-making in several of the chapters.

In the manner in which Kraemer et al. use the term, the IT managers are distinct from the top management because they have their own department or sub-unit of a department (e.g., finance department). In the Kraemer model, the interests of IT tend to be technical with emphasis given to keeping up with state-of-the-art technology (Kraemer et al., 1989, p. 115). In some small governments that I have studied, there is no professional IT manager or any IT staff, and a generalist manager handles the IT function with the assistance of vendors and consultants.

The third category (Kraemer et al., 1989) includes the managers of the "line" departments. This group is seen as focusing on how their substantive, departmental interests are served and are therefore narrower than those of the top management.

In my own interviews, I found that differences in perspectives and goals among these three categories of leaders are still important. However, there have been changes with governmental IT staff. The governmental IT staff I encountered are not as concerned about maintaining state-of-the-art technology as they are about standardization and centralization of decision-making concerning IT hardware and software because they want to minimize the difficulty of maintaining networks and supporting systems. Thus IT managers often need to seek the support of top management in setting strategic objectives and adopting enterprise-wide standards.

A related but complementary point is made by Huxhold's (1991) model of computing in which information systems are viewed as pyramids, with three different levels of information management:

1. **Policy Level:** This level involves top policy-makers and deals with organization-wide concerns such as providing support for making new ordinances.
2. **Managerial Level:** This level involves middle- and upper-level administrators in their management of departmental level issues such as management of personnel and performance monitoring.
3. **Operational Level:** This level involves daily work done at the "street level."

The *operational level* (Huxhold, 1991, pp. 17-20) would include tasks such as identifying information about work to be done at a specific address for the public works department in a city or for a particular client in a human services system. This raw operational data is then aggregated to the *managerial level* so it can be analyzed by departmental and "middle managers" who make decisions, such as to how to improve allocation of personnel, conduct personnel evaluations, and other managerial issues. Finally, the data may be further passed up to the *policy level*, where political and professional

administrators at the top of the hierarchy use it to make changes in policy, create new legislation, statutes and laws, and locate new services. Huxhold's point is that in order to be truly effective, an information system needs to be effective on all three levels.

In recent years, much attention has been given to the need to involve top management in making IT policy. Caudle (1996) argued that the most important element of best practices in IT is the involvement of senior management. In the past, senior managers often ignored IT, so the emphasis on the necessity of top management involvement has helped to rectify this neglect. Both the Kraemer et al. and Huxhold models support the importance of having an enterprise-wide perspective.

However, I argue that it is the end users, usually those who are the low ends of the organizational hierarchy, who know the most about the functionality of hardware and software and are the best source of information on the effectiveness of information systems. Moreover, since they usually are the source of the data input into the system, they are crucial to its validity. Their reaction is critical to the success of new systems. They can render systems ineffective by overt or passive resistance, as will be seen in my chapter on the politics of information management. If end users sabotage systems so the systems, or the data emanating from them, are not valid or reliable, then the systems cannot be effective, regardless of the degree of senior level involvement. Often, the membership of IT decision-making bodies emphasizes departmental and top management. This approach may work well if departmental managers represent the views of end users. But for planning and purchasing activities, failure to understand the end users point of view is a deadly mistake. To summarize, generalist managers need to ensure that balanced attention is given to the needs of all of the major groups and remember that the end users form the basis of the IT system.

Critical IT Processes

In this book, I concentrate on critical IT processes in which generalist managers must play an important role in order for the information system to be effective. Some areas, such as security, are extremely important but primarily technical and do not require direct involvement of generalist managers, whose role is to provide the resources needed by IT managers. But the areas outlined in the following sections, although they have major technical aspects, also depend in a major way on judgments and activities of generalist managers if they are to be effective.

Planning

There is a consensus among researchers and experts that strategic planning for IT must be performed and that generalist managers need to be heavily involved in this process. I found discrepancies between these prescriptions and the actual practices of governmental organizations, and I present an in-depth analysis of planning for IT, both as prescribed and as practiced.

Purchasing

Purchasing choices shape the nature of the system and help to determine how successful it will be. Purchasing has many technical aspects that IT staff and other technical

experts, such as consultants, will dominate. However, there are many important decisions that generalist managers should participate in, such as establishing the goals of purchases, how much should be spent on IT projects, choices between doing projects in-house versus outsourcing, among others. This book will cover the purchasing process in depth.

Implementation and Project Management

Much of the implementation of systems and project management requires technical knowledge and skills. But generalist managers will by necessity take part in certain crucial aspects that require their authority. Indeed, I will review several examples involving project management where non-technical issues dominated. I will provide additional examples of how generalist managers contribute to both the successes and failures of projects in the chapters on purchasing and politics.

Sharing Data and Systems

One of the strongest movements in IT today is towards enterprise-wide access to data and systems so that any legitimate user can access data from any department. The basic premise is that information should only have to be entered once into an organization's system and should then be available to any department and user who can make effective use of it. Many information needs (e.g., those involving financial and economic development) require the integration of information from several different departments and even other governments. Thus interoperability of systems has become a crucial issue. Also, in government, shared systems between organizations and levels of government are common. Sharing data and systems generally requires strong action on the part of generalist managers because there is often strong resistance to sharing among line departments and among agencies.

Training and other HR Needs Related to Technology

Because of its technical complexity and rapidity of change, training is especially important in the IT area, but both public and private organizations often have difficulty in implementing and sustaining IT training. It tends to be given low priority, especially when budgets are tight. Research shows that most personnel only make use of a fraction of the power of software applications, though organizations devote large amounts on upgrading that software. The chapter on training will discuss alternative approaches to training. More generally, organizations must establish ways for their personnel to take advantage of IT for knowledge-acquisition and this creates demands for cooperative action among generalist managers and the HR and IT departments.

Communication

IT has affected the nature of communication in governmental organizations as a larger portion of information is exchanged via e-mail, and this communication often has important ethical and legal consequences. As I pointed out earlier, managers cannot rely on only digital sources of information. They must gain much of their critical information

from observation and qualitative data-gathering methods. Another communication issue is that a fairly substantial portion of IT managers come from technical backgrounds and often are not strong communicators. Yet communication is a critical factor in determining how successful they will be in dealing with other departments and with generalist managers. I will discuss these communication issues throughout the book.

Structuring Systems, Politics, and Leadership

There are many internal and external decisions that involve conflict among different constituencies, such as how to structure the IT decision-making process. For example, what IT decisions should be centralized? Generalist managers need to be engaged with these issues. IT managers lack the formal authority and often the political and negotiating skills to solve these conflicts. Thus generalist managers will have to employ political and negotiating skills as well as their formal authority to provide the leadership to settle these disputes.

Ethical-Legal

Many ethical and legal issues have arisen concerning computing that require the participation of generalist managers to resolve. What rules should be imposed concerning the use of governmental computing resources? What penalties should be imposed if they are violated? Should governments raise revenue on their Web sites by advertising? Should government unions be authorized to use organizational systems to communicate their points? Although a lawyer or consultant knowledgeable about legal aspects of computing may have to be consulted about such issues, many of these necessitate value judgments in which generalist managers will have to be engaged. New technologies are constantly raising new legal and ethical issues. For example, do police have the right to place GPS (Global Positioning System) units on cars of suspects without obtaining court authorization (McCullaugh, 2005)? States such as California (Holmes, 2005) have passed several privacy protection laws that can have implications for governmental as well as business organizations. These are examples to illustrate the fact that new technologies and legislation may lead to decisions in which generalist administrators will have to be involved. I will discuss ethical and legal issues in several chapters, including those on communication and purchasing.

Evaluation

Assessing the value of IT in the private sector is difficult and the challenge in the public sector is much greater. There is much dispute on how to measure the effectiveness of governmental information systems due to the complexity of their goals. Despite this difficulty, it is important to evaluate IT because it competes for funding with other investments. Organizations are often dissatisfied with traditional measures used in IT such as the percent downtime or cost indicators, such as the cost per workstation. I discuss the dilemma of evaluation and alternative solutions in the chapter on evaluation.

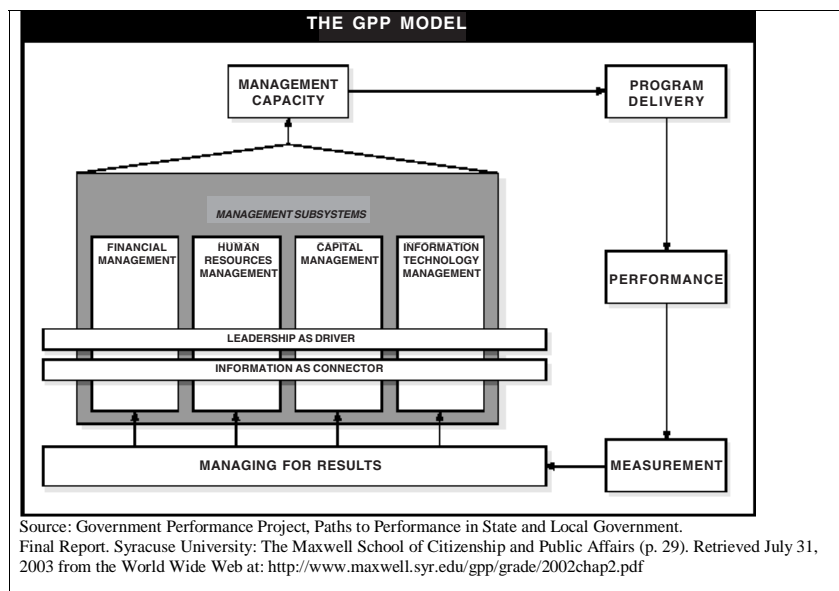
IT as Infrastructure

Internally IT now serves as the infrastructure which organizations employ to deliver services. Ideally, IT will contribute to making these services more accessible and cost effective. Regardless of the government, there is no question that IT has become recognized as the major infrastructure that underlines all other key government functions. Its importance is shown in Figure 3 developed by the Governmental Performance Project of The Maxwell School at Syracuse University in its study of state and local governments. I would like to emphasize again that the “information” includes both non-digital as well as digital information. The range of services provided by the IT staff can vary considerably. Some governmental IT organizations have already invested in systems that can be very expensive, such as geographic information systems (GIS) and enterprise resource planning software, while others find it impossible to afford such systems. Externally, some governments have sought to become major broadband providers in their community, while others are still considering the extent to which they should become involved in e-government. In short, the range of services and functions of the IT leadership can vary greatly depending on the organization, and it is generalist managers who ultimately determine the nature and extent of these services.

IT, Accountability and Data Stewardship Issues

Ultimately, IT will be judged by the political systems and key external users concerning the degree to which it is responsive to their values and goals. Indeed, the distinguishing characteristics of governmental organizations include their focus on openness and accountability. Consequently, an emerging use of governmental IT is to provide greater accountability for public services, such as through online report cards on various

Figure 3. *Information as infrastructure*



governmental agencies. These report cards represent important and sensitive data concerning organizational performance and there can be strong factors aimed at manipulation of this information. Thus the issues of accountability and quality of data are important but these are issues that have been largely neglected in the literature on governmental IT management. An entire chapter will be devoted to them.

Best Practices and IT

The pace of change in IT is rapid and has become more rapid in recent years. It is difficult for IT researchers to keep up with the fast pace of change. Consequently, practitioners frequently have to make their own decisions without much guidance as to what is the best course of action for their organizations. One of the most common approaches in this situation has been to adopt so-called “best practices.” I will explore the meaning of best practices in depth in one chapter, but basically it means that managers attempt to identify organizations that are consensually viewed as doing an excellent job, and it is assumed that the practices and procedures of these high performing organizations are the cause of their excellence. I will also attempt to take advantage of areas where IT researchers have developed and tested hypotheses through comparative empirical studies. Accepted wisdoms such as best practices, if they are to be employed in a wide variety of contexts, must be tested formally because they may not work in all contexts or different best practices may conflict with one another.

Theory and Research

In terms of theory, the basic point upon which all IT researchers agree is that information technology brings about changes in governments and thus is an independent variable. But technology is in turn influenced by organizational factors and that can block or alter the intended goals of IT. Thus IT can also be viewed as a dependent variable. This insight was made long ago by IT researchers. For example, in 1983 in an article entitled “Power, Politics, and MIS Implementation,” Markus identified the need to look at the interaction between technological and “people” factors to understand why implementation of IT systems resulted in a success or failure. She (Markus, 1983, p. 441) goes on to state that resistance to change should not be viewed just as “a problem but a clue” and that technology itself cannot “accomplish the task of organizational change.” She details how some parts of an organization continued to employ their old accounting methods after having implemented a new IS system, even though it required twice the effort.

More recently, Fountain (2001) has developed a theory of “*enacted technology*” in which the results of IT changes are influenced by a variety of bureaucratic and institutional forces who are often interested in preserving certain routines and patterns, so that the outcomes resulting from new technologies are often unintended and disappointing compared to the aspirations of those initiating the changes. Fountain provides three detailed case studies in which the attempt to implement new IT (including e-government) technologies ran into strong resistance that limited the success of the projects. Markus’s interaction theory and Fountain’s theory of enacted technology are both useful antidotes to the simplistic assumption, often referred to as the *technological imperative* that implementing a new technology is only a technical process and IT is primarily an independent variable. As Kraemer et al. (1989) demonstrate, “manage-

ment matters” and the same technology introduced into two different organizations may have drastically different results depending on how skillful the managers are in dealing with IT. In this book, I will analyze technology as an independent variable, such as its use in e-government, to bring about transformation to better processes, and as a dependent variable influenced by factors such as politics and informal communication.

Plan of the Book

Chapter I: Public and Private Information Systems: How Are They Similar? How Are They Different? This chapter will explore in detail how systems from the two sectors both resemble one another and are different. I view governmental information management as having some important differences in that competition is less prevalent and the willingness to share is more common in the public sector.

Chapter II: Planning for Information Technology in the Public Sector: This chapter looks at the prescriptions concerning the need to do planning and the reality that many organizations do not do long-term planning. It outlines the key steps of a comprehensive planning process and illustrates these with samples drawn from actual plans.

Chapter III: Procuring Information Technology for Government: This chapter outlines and provides details concerning the key steps that experts recommend for purchasing IT. It provides in-depth discussion of methods used to procure IT. It describes the challenges of project management that follow the purchase. The chapter employs examples of Request for Proposals and purchases done by governmental organizations to illustrate the points.

Chapter IV: Prescriptions for IT in Government: How Do We Know What Works Best? Governmental managers often need to make decisions about how to manage IT. The most common approach to making these decisions is to identify best practices used by other organizations, public and private. This chapter critically examines the concept of best practices and other approaches to managing IT.

Chapter V: Electronic Government: The development of e-government represents the tremendous growth in importance of IT to government. I will show how e-government is not only making government more accessible, but that e-government is being employed to transform government to make it more integrated and hence more effective and efficient.

Chapter VI: Politics, Leadership, and Information Technology: This chapter will analyze how internal and external politics play an integral role in determining the success of information management. It will use numerous examples concerning struggles over “turf” and other political concerns. It will also discuss how leadership by generalist managers is necessary to overcome the centrifugal forces that are common in governmental information management.

Chapter VII: Information Technology, Training, and Organizational Learning: Both researchers and practitioners acknowledge the centrality of training and learning in the IT field. Most end users employ only a fraction of the power of the software. The hardware and software change so rapidly that generalist managers need to ensure that adequate training is provided. This chapter will show that managers must take on innovative approaches including the use of informal as well as formal training. Other HR issues are also explored.

Chapter VIII: Information Management and Ethical Issues in Government: Information technology can lead to ethical dilemmas for managers. Indeed, IT technologies change so rapidly that managers are often forced to make ethical, and sometimes legal, judgments about technology before there have been any clear legal or ethical guidelines set. This chapter will examine emerging ethical issues caused by new technologies and outline steps and approaches that managers can use to get a handle on how to deal with these new dilemmas. It will give particular emphasis to computer-mediated communications, such as e-mail, because they are the most heavily used technologies and are often associated with the most difficult dilemmas.

Chapter IX: Evaluation and Information Technology: There is a consensus that it is important to evaluate information management, but it is not an easy task. Easy-to-measure metrics such as percent of downtime are unsatisfactory. I discuss alternative approaches to evaluating information systems.

Chapter X: Governments and IT Sharing: Governmental IT has one major advantage over private sector IT—there is no competition to inhibit sharing of information with other governments. Some of the most important information systems involve exchanges between different levels of government. Sometimes these shared information systems are voluntary and viewed as mutually beneficial. Sometimes they are mandated and one party often is less than enthusiastic about its participation, and this situation can lead to problems. The basic point is that these shared systems are extremely important but have received little attention.

Chapter XI: Information Technology, Accountability and Information Stewardship: The ultimate goal of public information systems is to be responsive to the citizenry and the political system. This chapter will study the use of governmental IT systems to achieve greater accountability of government through various performance measurement and report card systems. It will focus on the problems of quality of data and the ability of the informal system to resist the formal system.

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Additional Reading

Governments began using computing decades ago. Kenneth Kraemer and his various associates conducted major studies of information systems for decades and their works form the foundation of research on governmental management information systems. They studied the issue of integration of urban information systems in the 1970s and clearly anticipated Enterprise Resource Planning and the emphasis on enterprise-wide systems (Kraemer et al., 1974). They employed a variety of data sources including quantitative performance measures, structured surveys, and qualitative case study interviews (e.g., Kraemer et al., 1981, 1989). Any serious student of governmental management information systems will review their work. The idea that governmental information systems might be significantly different from private information systems was initiated by a seminal article by Bozeman and Bretschneider (1986). Syracuse University researchers have produced some important empirical volumes such as studies of information management in states (Caudle & Marchand, 1989) and counties (Fletcher et al., 1992). There is a growing body of empirical literature on e-government and governmental Web sites. The Andersen and Dawes (1991) book on Government Information Management continues to be worthwhile for its succinct “lenses” approach to IT management in government. Barrett and Greene’s book (2001) is valuable in providing some detailed case studies of information management in governments. Overall, there are serious limitations of the work on governmental information systems and the Kraemer and Dedrick (1997) article identifies some of these problems.

Key Concepts

- B2G
- C2G
- Equivocality
- G2C
- G2B
- Managerial level
- Operational level
- Policy level
- Rich data
- Technological Imperative
- Theory of enacted technology

Discussion Questions

1. I have listed what I believe to be key actors, processes, and factors that influence information management. Can you think of any other actors, processes, and forces? Which forces are most important in organizations with which you are familiar?
2. Can you think of any cases where new technologies introduced into the organization did not work as intended? In what situations are information technologies most likely to be successful? Unsuccessful?
3. Identify an organization with which you are familiar and discuss how good you think it operates at the three levels that Huxhold identifies.
4. I have argued that generalist managers must be actively involved in these critical processes if information systems are to be effective. Do you agree or disagree?
5. Discuss with people in your organizations about the role of qualitative, non-digital data versus formal data residing in the digital information system. Discuss the role each kind of data (qualitative, non-digital and formal-digital) plays in making important decisions. Do any qualitative types of data have important influences on these decisions?
6. After reading the Carr article and those arguing against his position, reflect on your knowledge of organizations. Do you agree or disagree with Carr concerning the role and importance of IT?
7. Read the following case chapters and article and prepare an analysis of what are the key actors and forces at work in the case of the termination of the California Department of Information Technology. Based on these readings, the Anderson et al. chapters, and Peterson article on California, who are the key actors and what are the forces that played a significant role in the outcome of this particular incident? Discuss what this analysis tells about the role of IT policymakers.

What recommendations for change would you make if you were in charge of reorganizing the State of California's IT structure? Finally, read the recent report on California's "Prescription for Change" put out by the Schwarzenegger administration in California and identify its recommendations for changes in the IT structure. Do you agree with the report's recommendations?

Exercises

1. Analyze the structure of decision-making concerning information management in an organization with which you are familiar. Who has formal authority to make decisions? Create a schematic (e.g., using drawing tools in Microsoft Word) showing the formal structure of your organization with respect to IT decision-making. Discuss if there are any persons who have important influence even though they do not have formal authority.
2. Describe the major hardware and software systems that are used in an organization with which you are familiar. If the organization is large, you may focus on a sub-unit. Does the organization have an inventory of all major hardware and software? The organization may have a systems diagram that provides an overview of the system components and how they relate. Obtain this diagram if possible and bring to class to hand in. (Note, however, that IT staff sometimes may be reluctant to share these diagrams and some of the hardware and software information for security reasons.)