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Historical Foundations of KM

When the [US] Department of Defense invented the Internet in the 1960s as a communications network for defense research purposes, no one could have foreseen how it would transform society three decades later. Today, the Internet has become a part of the daily life of [citizens around the globe].
(Ho 2002, 434)

Information technology (IT) has become one of the core elements of managerial reform, and electronic government (e-government) may figure prominently in future governance. IT has opened many possibilities for improving internal managerial efficiency and the quality of public service delivery to citizens.
(Moon 2002, 424)

This book is about the use of knowledge management (KM) systems and processes by government organizations to improve the ways they operate and the ways that they deliver public services to citizens. Improving organizational performance includes making it possible for agencies to become more innovative in carrying out their missions, while at the same time becoming more accountable to the publics they serve. The organizational drive is to harness the existing knowledge in government agencies to foster creative problem solving by government workers at all levels. Knowledge management is a key component in this new way of functioning.

Chapter Objectives

This chapter has been framed on a set of objectives that are designed to help readers:

- Gain an introduction to the field of knowledge management and its evolution into an accepted principle for public-sector administration and management.
- Understand how KM is an essential component in the transforming government and e-government movements.
- Understand that, although significant differences exist between the private and public sectors, many management concepts and processes—such as knowledge management—are equally applicable in both sectors.
- Recognize that KM is only the latest in a long tradition of management methods and programs that have been designed to enable the leveraging of organizational knowledge and experience.
- Understand how KM helps government organizations make the highly desirable shift from reactive agencies to learning organizations.
- Understand that KM enables greater innovation and creativity in government organizations.

Business managers and managers of public agencies are often told that management in the two sectors is inherently different. It is not the purpose of this book to seek to say whether that statement is true or not. However, it does deal with the question: *Is the way KM is acquired and implemented in government really any different than it is in business and industry*? Depending upon with whom you're conversing, you would still hear *yes, no,* or *maybe*. This book proceeds on the premise that those who support the difference argument are probably right.

Writing on the use of executive information systems in government, one group of observers had this to say about differences between the private and public sectors:

> Differences between private and government organizations are at the core of public administration theory and have been the topic of an ongoing stream of research. . . . Differences have been found, for example, in personnel management, decision making and information systems. (Watson and Carte 2000, 373)

Watson and Carte also identified these bases for the differences: environmental factors, the ways in which sector organizations interact with their environments and with their stakeholders, and fundamental differences in organizational structures and processes. Also, because public organizations have less interaction with the market, they are not as influenced by rewards and punishments associated with market controls. Finally, public sector organizations:

- Are more constrained in their choices of procedures,
- Perform activities that are mandated by political forces,
- Face more external formal controls and specifications on their actions,
- Deal with greater external influence on what they do and how they do it,
- Gain approval from a wide variety of stakeholders,
- Have multiple, often contradictory, objectives,
- Have less autonomy and control over decision making and human resources,
- Are less able to devise incentives for staff performance,
- And are often forced to have their failures—large and small—aired in the public press.

The editorial director of the industry journal *KMWorld* prefaced a special supplement on best practices in government in the June 2005 issue of the magazine, in which he stated flatly, "The point being: government is different." However, then speaking for KM consultants and IT vendors, he added, "But as 'different' as government can be, it can also be very familiar" (Moore 2005, S2).

Three of what may be the greatest differences are (1) the government's move toward enterprise architectures—the mandate for all agencies to identify commonalities of use in IT so that cost savings can be gained through bulk purchases; (2) government's long history of learning how to work with regulatory issues in the use of KM and IT; and (3) the driving force of public policy that forces government agencies to respond to legislative and executive mandates.

An IT industry spokesperson was quoted in the same special supplement preface of *KMWorld,* speaking on the regulatory experience of government: "Government is in on the forefront of regulatory compliance because they have had compliance mandates for decades." In industry, corporate standards on the use of IT are still fairly new; many businesses are just beginning to understand the sensitivity and discoverability of electronic records—as the officers, managers, and directors of Enron and Anderson Consulting learned to their dismay.

Government purchases of KM systems and support are also driven by public policy—a point that the private sector does not have to deal with. Moore quoted another industry spokesperson, Gary Ward, vice president of sales for X1 Technologies: "You can have the most amazing technology in the world, but if there is not a policy imperative driving the adoption, it [selling to the government] is going to be difficult sledding in the public sector." Summarizing his views on the differences, Moore concluded, "In government the driving impetus is from public policy and budget pressure. In the private sector, the driving impetus is business performance and . . . budget pressure."

Evolution of KM in the Public Sector

Many observers feel that KM is really nothing new. Rather, it should be considered the latest component in the government's fifty-plus-year effort to integrate information technology (IT) into operations to improve performance and make government agencies and departments more accountable. By 2005, the latest development in this progression had become a global movement to reform the way governments serve their citizens; around the world that movement is referred to as *e-government.* One leading enterprise software and knowledge systems industry spokesperson described the foundation for this movement in these terms:

> Governmental organizations worldwide are facing several challenges as administrative, executive and judicial bodies continue to evolve into an electronic work environment. Pushed by paperwork-reduction mandates, requirements to handle increase workloads with fewer personnel and the rapid adoption of electronic communication channels by taxpayers and citizens, governments are often on the forefront of adopting new approaches to electronic information management. (McKinnon 2005)

Tacit knowledge is knowledge held in the minds of the men and women who hold, use, and share what they know about things and how to do what they do. Explicit knowledge is knowledge that has been or can be written down and contained in documents and other media.

Three converging trends are behind the drive by public-sector organizations to gain better control of their information infrastructure and management of the tacit and explicit knowledge held by their personnel and in knowledge repositories in the organization. The first trend is the expected high turnover in knowledge workers as large numbers of the baby-boom generation retire; a number of studies have cited the coming loss of senior project and technical managers as the greatest risk facing the public sector at the start of the new century.

The second trend is a global acceleration of the push to implement e-government; agencies at all levels have been increasing the amount and variety of online services available to citizens. Many government agencies are also providing mobile communications capability for their knowledge workers, thus enabling them to communicate as information is gathered. Such electronic tools as personal handheld devices, smart phones, tablets, and laptop computers have freed knowledge workers from the tyranny of being chained to a desk.

The third trend is continued emphasis on *Enterprise Architecture Initiatives* (i.e., shared services) to achieve greater operational efficiencies and

implement Web-based service delivery. Agencies must comply with enterprise architecture analyses mandated by the Office of Management and Budget (OMB) before they can replace or acquire new information technology. McKinnon described this mandate as "the constant battle to develop operational efficiencies in the face of budget and program cutbacks." It means that all government agencies must include IT acquisitions in their strategic plans. They must also establish common network platforms for e-mail, and all information and knowledge management systems.

What KM Does

KM is about managing information to make the most of the knowledge in an organization in order to benefit from finding and applying innovative answers to old and new questions. Information and communications technology constitutes one of the three chief building blocks of knowledge management. The other two are the people who use knowledge and the processes that have been developed to enable and enhance knowledge capture and sharing (Joch 2004).

Technology has made it possible for KM to evolve into what it has become today—a key management tool that is necessary for agencies and institutions to function and flourish in today's knowledge economy. Few would argue with Peter Drucker's 1995 conclusion that the world has entered upon a postindustrial economy characterized by globalization, increasingly sophisticated information and communications technology, and a knowledge society. Nonaka (1991) added that in this new economy the only certainty is that knowledge is the only sustainable source of competitive advantage (Butler et al. 2003).

This chapter presents a brief review of how early knowledge management concepts evolved over the first decade or so of KM's existence, to the point where by the middle of the first decade of the twenty-first century, KM had become a normal way of operating in many federal, state, and local governments. Administrators and managers agree that KM's blend of technology, people, and processes holds a key to organizational improvement, if not even for survival, in the face of an environment characterized by heightened political polarity, severely limited resources, and demands for government agencies at all levels to do more with less.

What KM Does Not Do

Amrit Tiwana included a list of things that KM does not do for organizations in the second edition of his *Knowledge Management Toolkit.* These points were offered as a way for KM system designers and government purchasing agents to "cleanse" themselves of intense vendor pitches:

- KM is not knowledge engineering. Rather, KM falls into the domains of management and information systems, not computer science.
- KM is not only about digital networks; it is about management processes. Technology is an enabler, not a driver.
- KM is not about building a smarter internal communications network (intranet). Nor are they the same. KM is about knowledge and experience.
- KM is not about a one-time investment in technology. It is a future-oriented investment that requires consistent attention and evaluation.
- KM is not about "enterprise-wide *infobahns*" (information highways in organizations). KM should not be confused with enterprise information systems. The primary focus is on helping the right people have access to the right knowledge at the right time. (Tiwana 2002, 8)

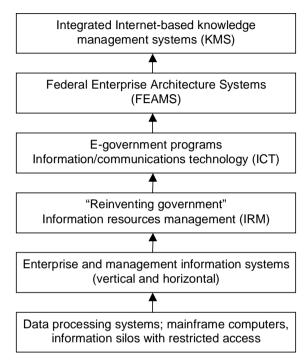### The Evolution of KM and KM Systems

When examined objectively, KM and knowledge management systems (KMS) may be considered to be the latest manifestation in a logical progression of governments' concerns with data, information, and knowledge. A representation of this evolutionary process is displayed in Figure 1.1.

The federal government's current concern with improving the performance of government agencies can be traced as far back as 1943, when the first book that included a call for local governments to measure their performance and offered guidelines for government to follow was published. However, government reformers had to wait a long time for the federal government to act on that recommendation; it was not until July of 1993 that Congress finally passed the Government Performance and Results Act (GPRA). GPRA required all agencies to develop strategic plans, set goals and objectives, and begin to measure their progress toward those goals (Aristigueta 2002).

Although computers had been in use in agencies for many years, government's generally heightened interest in information and communications technology began in earnest in the late 1980s. It took a more substantial form during the Clinton/Gore administrations of the 1990s and emerged in full bloom in the administration of President George W. Bush. In the 1990s under President Clinton the performance improvement program was called *reinventing government;* after 2002, the movement became the less dramatic but equally innovative concept of *e-government.*

The first wave in this evolutionary process began in the late 1950s and 1960s with the installation of mainframe computers to process large amounts of data. Among the heaviest users of computers for this purpose were the Census Bureau, the Department of Commerce, and the military. During the decade of the 1970s, as computer hardware and software gained more power and new appli-

Figure 1.1   **From Data Processing to Full Knowledge Management Systems**

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┌────────────────────────────────────────┐
│   Integrated Internet-based knowledge  │
│     management systems (KMS)           │
└────────────────────────────────────────┘
                    ▲
┌────────────────────────────────────────┐
│   Federal Enterprise Architecture      │
│          Systems (FEAMS)               │
└────────────────────────────────────────┘
                    ▲
┌────────────────────────────────────────┐
│       E-government programs            │
│ Information/communications technology  │
│               (ICT)                    │
└────────────────────────────────────────┘
                    ▲
┌────────────────────────────────────────┐
│       "Reinventing government"         │
│  Information resources management (IRM)│
└────────────────────────────────────────┘
                    ▲
┌────────────────────────────────────────┐
│ Enterprise and management information  │
│    systems (vertical and horizontal)   │
└────────────────────────────────────────┘
                    ▲
┌────────────────────────────────────────┐
│ Data processing systems; mainframe     │
│ computers, information silos with       │
│ restricted access                      │
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cations developed, more agencies looked to the new promise of computers to store, process, codify, process, and synthesize the reams of data governments must collect and retain. A key development at this time was the appearance of a variety of vertical management information systems.

A problem with these systems was that they tended to be largely agency or application specific, and unable to communicate with other systems. Thus, access to the information they contained remained restricted to members of the unit. It was impossible to share others' information and, more importantly, learn from earlier mistakes. Overly customized systems that are unable to meet performance requirements remain a major problem in government.

An Executive Information Systems Solution?

A solution for some of these difficulties was the internal development in the late 1970s of a few broadly based executive information systems (EISs). It was

not until the mid-1980s that commercial systems became available (Watson and Carte 2000). Although the early EISs were developed for only a few highest-level executives, they soon evolved to be able to support all top management teams, and, in some large firms, can today serve a hundred or more users.

The importance of these executive systems to the development of comprehensive knowledge management systems in the late 1990s cannot be overemphasized. For example, EISs are designed to provide many of the following services:

- Extract, filter, compress, track, and indefinitely store critical data,
- Provide online status reports, trend analyses, and exception reports,
- Provide "drilldown" capability to access supporting detail or underlying data,
- Conduct data analysis, using such tools as spreadsheets and data mining,
- Support decision support systems,
- Access and integrate a broad range of internal and external information,
- Provide support for such electronic communications as e-mail and computer conferencing,
- Prepare and present graphics, tables, and textual information,
- Provide organizing support, such as electronic calendars,
- Are user-friendly and require little or no formal training to use.

The Drive for Coordination and Control

By the 1990s, it was clear that some higher-level coordination and control was needed over the acquisitions and applications of IT systems by agencies. A single organization was needed to oversee IT resources (Lee and Perry 2002). The federal government's answer was to place information resources management (IRM) under the auspices of the Office of Management and Budget. Tasks and responsibilities included oversight of planning and budgeting for all federal agency activities associated with acquiring, storing, processing, and distributing data and information.

While OMB began its coordination and control over IT, others in government were envisioning an even greater role for IT in all levels of government. They dreamed of using the lessons learned in the private sector's use of IT to introduce the same private-sector productivity gains in government. Government was to be more businesslike. That meant higher performance standards, stronger performance measurement, and stricter accountability for results. Their vision became codified in the reinventing government initiatives issued from the Clinton White House.

According to Qiao and Thai (2002), the National Performance Review

Table 1.1

Twentieth-Century Efforts to Reform Government

Year	Reform effort or program
1905	Commission on Department Methods (Keep Commission)
1910	President's Commission on Economy and Efficiency (Taft Commission)
1921	Joint Committee on Reorganization
1936	President's Committee on Administrative Management (Brownlow Committee)
1947	First Hoover Commission
1960	Task Force on Government Reorganization
1969	Advisory Council on Executive Organization (Ash Council)
1977	Carter Reorganization Effort
1982	President's Private Sector Survey on Cost Control (Grace Commission)
1987	National Commission on the Public Service (Volker Commission)
1993	National Performance Review (Gore Commission)

Source: Yuhua 2002, 91.

(NPR) Act, which gave life to the reinventing government movement, may have been the most important reform of the twentieth century. It came at a time when there was higher-than-ever demand for changing the way governments function. However, like everything else that happens in Washington, most of the concepts and proposals included in NPR were not new. There were at least eleven earlier attempts at reinventing the bureaucracy, as the list in Table 1.1 illustrates.

President Clinton included a number of e-government initiatives in his June 2000 first Webcast address. A key proposal revealed in the address was a plan to put all online resources offered by the federal government on a single Web site, www.Firstgov.gov. Not long afterward, many state and local governments expanded their adoption of IT for similar purposes.

The adoption of e-government at the federal level became more of a reality in February of 2002, when newly elected President George W. Bush described what came to be known as the *President's Management Agenda* (PMA) in his annual budget submission to Congress. PMA was offered as a way of getting government to be more focused on citizens and results. A large component in the mechanism for making this happen was expanding the role of electronic government. Under the Bush plan, e-government focused on Internet-based technology in its efforts to make it easier for citizens and businesses to interact with government agencies and departments (OMB 2005a). In addition, adoption of the e-government initiative was promised as a way to save taxpayer dollars and streamline citizen-to-government communications.

Box 1.1

The Federal Enterprise Architecture Program

Federal Enterprise Architecture (FEA): FEA is a business model–based* initiative designed to provide a common framework for improving such areas of federal government operations as budget allocations and budget and performance integration, horizontal and vertical information sharing, performance measurement, cross-agency collaboration, e-government, and component-based architectures, among others. Led by the Office of Management and Budget, the fundamental purpose of FEA is to identify opportunities to simplify processes and unify work across agencies and within the lines of business of the federal government. A key goal of FEA is to help agencies become a more citizen-centered, customer-focused government that maximizes investments to better achieve mission outcomes.

Federal Enterprise Architecture Management System (FEAMS): FEAMS is a Web-based management information repository and analysis system designed to provide agencies with access to initiatives aligned to the federal enterprise architecture (FEA) and associated references models. FEAMS was issued by the OMB in December of 2003 to provide users with an intuitive approach to discover and potentially leverage information technology components, business services, and capabilities across the federal government.

Source: www.whitehouse.gov/omb/egov/a-1-fea.html. 2003.
*According to the OMB, the business reference model is based on the government's "lines of business" and its services to the citizen, independent of the agencies and offices involved. Thus, one line of business may include two or more traditional agencies.

OMB employed a business-practices model called *federal enterprise architecture* (FEA) to guide agencies in the analysis of their current and future information and communications technology (ICT) needs and implementation of identification of common practices and systems. The application template is called the *Federal Enterprise Architecture Management System* (FEAMS). Both models are described in Box 1.1.

As noted earlier, the drive to implement e-government has become a global phenomenon. In 2005, however, not all attempts to bring the public to
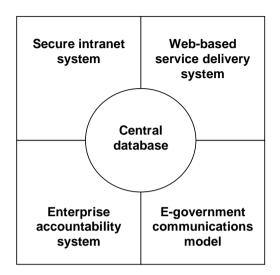
Figure 1.2 **Key Components of Early E-Government Systems**

taking advantage of the many opportunities e-government affords them were successful. The United Kingdom had surprising difficulties in getting the public to use the e-government Web sites established for citizen transactions (Perera 2005). Although nearly all of the 400 local governments in the UK were expected to have established e-government services by the end of 2005, a "digital divide" exists between the UK citizens who have access to computers and those who do not. The UK government reports that e-government use is low even among those who do have access. One of the mistakes contributing to this low usage rate is the failure of the UK e-government designers to take full advantage of the potential in their first contact Web site, Directgov; this site is the UK equivalent of the U.S. first access site, FirstGov. Rather than containing links to local government Web sites, the content of Directgov is mainly limited to policy statements.

KM and E-Government—Evolutionary Stage

The E-Government Act of 2002 (H.R. 2458/S. 803), which became effective on April 17, 2003, established an Office e-government and authorized appointment of an e-administrator within the OMB.

Developing a coordinated federal, state, and local policy on the use of information technology is a key goal of the program. Working with state, local, and tribal governments, the general public, and the private and non-

profit sectors, the e-government office is charged with finding innovative ways to: (1) improve the performance of governments in collaborating on the use of information technology to improve the delivery of government information and services; (2) set standards for federal agency Web sites; and (3) create a public directory of government Web sites. Figure 1.2 illustrates how the components of early e-government systems interact.

Originally, e-government included four fundamental components: First, a secure government intranet and central database was established to enhance communication and collaboration between agencies. Second, a system for the Web-based delivery of government services was developed. Third, taking a page from the private sector, an e-commerce model customized to fit governments' needs was developed to provide greater efficiency in transactions such as government contracts and procurement. Finally, provisions for gaining greater and more open accountability were included (Moon 2002). These components were supported by such technologies as electronic data interchange, electronic filing systems, interactive voice response, voice mail, e-mail, Web service delivery, virtual reality, and many others.

Under the form established in PMA, the purpose of the new e-government initiative is to improve the management and performance of the federal government by focusing on operational areas where deficiencies are most apparent and where the government could begin to deliver concrete, measurable results. PMA includes five federal government-wide initiatives and ten program-specific initiatives that apply to a subset of federal agencies. For each initiative, PMA established clear, government-wide goals (termed *Standards for Success*), and developed action plans to achieve the goals. The five government-wide initiatives are:

- *Budget and Performance Integration (BPI):* BPI includes efforts to ensure that agency and/or program performance is routinely considered in funding and management decisions, and the programs are monitored to make sure they achieve expected results and work toward continual improvement.
- *Competitive Sourcing (CS):* This initiative calls for agencies to regularly examine activities performed by the government to determine whether it is more efficient to obtain such services from federal employees or from the private sector (often referred to as *outsourcing*).
- *Expanded Electronic Government (EEG):* This refers to actions designed to ensure that the federal government's $60-billion annual investment in information technology (IT) significantly improves the government's ability to serve citizens, and that IT systems are secure and delivered on time and on budget.
- *Improved Financial Performance (IFP):* IFP is concerned with accu-

rately accounting for the taxpayers' money and giving managers timely and accurate program cost information to improve management decisions and control costs.

- *Strategic Management of Human Capital (SMHC):* SMHC consists of processes to ensure the right person is in the right job, at the right time, and is not only performing, but performing well. It is closely associated with Human Resources Planning (HRP).

To monitor and maintain agency progress, the OMB publishes a government-wide quarterly scorecard, in which it reports individual department and agency progress on the five initiatives. An example of how the scorecard is used to push for compliance with the five-point agenda is a published e-mail warning from OMB that it would downgrade the Agriculture Department from a yellow to a red—the lowest rating—on the competitive-sourcing section of the quarterly management scorecard unless the U.S. Forest Service allowed outside suppliers to bid on at least 100 information and communications technology jobs by the end of the 2005 fiscal year.

Despite what many consultants and knowledge management government personnel would like us to believe, and the federal government's wholesale adoption of information technology, knowledge management in the public sector remains very much a work in progress. This is particularly so at the state and municipal government levels. Acceptance of knowledge management principles and programs by the states mirrors the difficulties states are experiencing in the IT-component level of KM.

From IT to FEA to KM

In the last decade of the twentieth century a small group of academics, management consultants, information technology people, and business leaders came to the realization that the key to an organization's success—or survival—in the new information economy lay in their ability to employ the technology increasingly available to collect, distribute, store, and use the knowledge that made them distinctive (DCMA 2004). Out of this consensus came a realization that what has come to be known as knowledge management has a direct and important contribution to make in implementing and sustaining e-government.

Voss, Roeder, and Marker (2003) have identified three aspects of knowledge management support for the idea that ICT can contribute to success in e-government. First, *intellectual capital* is the basis for cooperative actions that involve multi-party processes, and which often include public participation. This intellectual capital resides in stakeholder organizations with different roles and knowledge backgrounds. Intellectual capital is contained in

an organization's recorded information and its human talent. The term reflects the understanding that information is a growing part of every organization's assets. Such information is often either inefficiently archived or simply lost, especially in large, physically dispersed organizations such as federal agencies.

Second, the combined knowledge management concepts of *learning organizations* and *process optimization* are core elements in both the reinvention of government and the e-government models. The role of learning in organizations gained international awareness with the appearance of Peter Senge's *The Fifth Discipline* in 1990. Nonaka and Takeuchi's *The Knowledge-Creating Company* in 1995 also focused on organizational strategies for creating new knowledge as a tool for gaining a competitive advantage.

A learning organization is one that has learned how to modify the way it operates as a result of new information, knowledge, and insights. The key product of the process is development of a *knowledge chain*. The chain identifies processes for collecting knowledge and producing, customizing, and delivering knowledge when and where it is needed. For applying the concept to government, this means

> finding the materials [and processes] suitable to feed the knowledge chain: a) to identify the fragments of knowledge that could be efficiently reused but, above all, accepted; b) to represent and formalize such fragments to the tractable (stored, analyzed, understood, customized, and eventually transferred). (Bresciani, Donzelli, and Forte 2003, 49)

The goal of process optimization is to increase the efficiency of organization processes with regard to time, costs, and quality through effectively managing the organization's knowledge. To achieve these goals, topic-oriented intranet networks are developed to acquire and distribute knowledge across organizations and organizational processes.

Third, the concept of a *knowledge base* is important to cooperative planning processes in e-government. The term *knowledge base* has traditionally referred to the data produced by the knowledge-acquisition and compilation phases of creating an expert system application. But that definition is now often broadened to include every imaginable corporate intellectual (and technological) asset. In this way, the knowledge base refers to the complete collection of all expertise, experience, and knowledge of those within a public organization.

Unlike their counterparts in business and industry, federal, state, and local government agencies have been forced by laws and organizational (often presidential) initiatives into absorbing electronic information and communi-

cation systems into every possible aspect of their operations as a way of becoming more efficient and effective. Interestingly, this mandate to improve the way government operates is a global pattern, not exclusively a North American phenomenon (Auditore 2003).

Even while governments are being told to become more efficient and technologically savvy, there is also a global movement under way to shrink government, to make it more responsive to citizens' needs, and to improve its accountability. In brief, the mandate is to reform government along the lines of business. This reform includes the privatization of programs and activities wherever possible. Globally, these initiatives are collectively referred to as *electronic government*, or simply *e-government*.

What Is E-Government?

E-government has been defined as consisting of actions to produce and deliver government services to citizens, not in the traditional face-to-face manner, but instead through the use of communications technology. A more inclusive definition would include the application of any information and/or communications technology used to "simplify and improve transactions between governments and other actors, such as constituents, businesses, and other governmental agencies" (Moon 2002, 424). Thus, e-government involves the use of information and communications technologies (ICTs) to ensure that citizens and businesses receive better quality services, mainly through such electronic delivery channels as the Internet, digital TV, mobile phones, and related technology.

A Global Reform Movement

Many governments worldwide are developing and implementing e-government strategies and programs (Borras 2003). International examples of e-government reforms include such programs as Public Service 2002 in Canada, Next Steps and Modernizing Government in the UK, Renewal of Public Service in France, Financial Improvement Program in Australia, Administrative Management Project in Austria, Modernization Program for the Public Sector in Denmark, and the Major Options Plan in Portugal (Haque 2001). The European Union is providing encouragement and incentives for such programs to all EU member states through its "eEurope" initiative (Aichholzer 2003).

The results of an international study of e-government jointly sponsored by the United Nations and the American Society for Public Administration contained the following description of e-government:

> E-government includes the use of all information and communication tech-
> nologies, from fax machines to wireless palm pilots, to facilitate the daily
> administration of government . . . [and] improves citizen access to govern-
> ment information, services and expertise to ensure citizen participation in,
> and satisfaction with the government process . . . it is a permanent commit-
> ment by government to improving the relationship between the private citi-
> zen and the public sector through enhanced, cost-effective and efficient
> delivery of services, information and knowledge. It is the practical realiza-
> tion of the best that government has to offer. (Moon 2002, 425)

Although there are differences among strategies adopted by different gov-
ernments, Bresciani, Donzelli, and Forte (2003) have identified a "common
roadmap" government agencies are following on their path toward e-govern-
ment implementation. Four common checkpoints on that roadmap include:
(1) establishment of a government-wide communication infrastructure to
enable cooperation among the different public-sector components, both at
the central and local levels; (2) creation of the appropriate ICT infrastruc-
ture; and (3) establishment of relevant channels for service delivery. Funda-
mental for the first three steps and recognized as the key for efficiently
managing e-government evolution is (4) transformation of the public agency
into a *learning organization*, in which high knowledge sharing, information
reuse, and strategic application of the acquired knowledge and lessons learned
regularly occur.

The e-government movement in the United States is a logical extension of
the reinventing government movement that began in the late 1980s, and which
was codified with the publication in 1992 of David Osborne and Ted Gaebler's
Reinventing Government. E-government moved from concept to reality dur-
ing the administration of President Bill Clinton, who professed the belief
that e-government offered a means of overcoming the time and space barri-
ers that in the past had limited delivery of government services. The very
nature of the public sector has resulted in mixed signals regarding the ben-
efits of KM, as one Italian study has indicated:

> Public [sector organizations] . . . are characterized by the presence of very
> diverse kinds of actors (e.g., citizens and businesses, employees and ad-
> ministrators, politicians and decision makers—both at the central and local
> level), each of them with its own objectives and goals. Thus, in general, e-
> government applications have to operate in a social environment charac-
> terized by a rich tissue of actors with strong interdependent intents. Due to
> this complex network of interrelated objectives, synergies and conflicts
> may be present. (Bresciani, Donzelli, and Forte 2003, 51)

Forging a Definition for KM

Now that the connection between data processing, MIS, reinventing government, e-government, federal enterprise architecture, and knowledge management has been established, we can take a closer look at KM and KM systems. Knowledge management has been defined in a number of different ways—a fact that many authors point to as being one of the reasons why KM has not achieved greater acceptance among organizational managements.

One of the more commonly seen definitions is that provided by Nonaka and Takeuchi (1995), who defined KM as the substantiated understandings and beliefs in an organization about the organization and its environment. They also differentiated between two types of knowledge: explicit and tacit. Explicit knowledge is codified, easily translated and shared facts and information; it exists in reports and other documents. Tacit knowledge is personal knowledge that is hard to confirm and share with others; it is the private understanding and *knowing* that people have about issues, problems, services, and products. A major task of KM is to turn tacit knowledge into explicit knowledge.

Amrit Tiwana (2002) defined knowledge management as a changing mix of workers' experience, values, expert insight, and intuition that provides an environmental framework for evaluating and incorporating new experiences and information. It resides in the minds of workers, but is often expressed in the culture of the organization, including its routines, processes, systems, and norms (this definition is similar to many of the definitions for human capital).

Is It Just Another Fad?

To some, KM is considered just another management fad, like Management by Objectives (MBO) and Total Quality Management (TQM). Moreover, knowledge and knowledge management are seen by some as simply other names for information and information technology (Fuller 2002; T.D. Wilson 2002). To others, KM represents a major paradigm shift in management thinking. This change was brought about by the shift from an industrial to an information economy, in which knowledge is now an organization's most valuable resource, and one which should be managed and utilized wisely. It is important to remember that KM has both a technological and a social side. And, it is a management discipline that is still in its formative stage. Thus, the arguments of both its critics and its champions have some credibility.

The Two Worlds of KM

Traditionally, the practice of knowledge management has united the orbits of two worlds: the world of information and communications technology, and

the world of people at work. This second aspect is often referred to as the "people side" or "soft side" of the knowledge management discipline. It is also the least understood and most problematic; it is also now considered the most important side of KM. The ability of an organization to grow its knowledge base depends upon the extent to which members exchange and combine existing information, knowledge, and ideas.

The technology side of KM has been where the money is. As a result, suppliers (*vendors* in government parlance) of computer hardware and software dominated the literature, conferences, and spending on KM for the first decade of its development. Beginning in the first years of the new century, however, this trend began a shift to a greater emphasis on applications. This has meant that applications integrators and KM systems consultants, including a growing number of academics, are contributing more to the growth of the KM discipline.

Conventional wisdom suggests a caveat for anyone hoping to pin reductions in spending and improvements in government performance and accountability to any rationality imposed on the government's purchase and use of technology, as John Nicolay pointed out in a *Public Administration Quarterly*:

> Two issues are clear: there exists no theoretical underpinning for the use of information technologies as an agent of change in the public service and, two, at the federal level, technology itself is regarded as a positive investment while human capital is not. (Nicolay 2002, 65)

KM at the Local Level

Like the rest of the industrialized world, today America and Americans live, work, and play in a cultural and economic environment that is permanently shaped by global access to information. More and more, this means access to information via the Internet. Over the last decade and a half, the economies of many industrialized nations underwent a wave of technological change that has significantly reshaped nearly every aspect of both the private and the public sectors. Information-age technologies are changing people's values and the nation's interests (Acs 2002; Ho 2003). Access to information—and to the knowledge that results from the application of information and communications technology to problem solving and decision making—has influenced the way businesses operate, the ways consumers purchase goods and services, and the ways that government at all levels provides public services.

Before the growth of the Internet, the federal government was already applying information and communications technology to improve operating

efficiency, but primarily for internal communications and managerial purposes. This growth in Internet usage and e-commerce that occurred during the 1990s in the private sector soon pressured the public sector to serve citizens electronically in what is recognized globally as the "e-government" initiative (Ho 2002, 434).

Although the e-government movement has been widely accepted at the federal level, its acceptance appears to be moving less rapidly at the local level. In 1997, for example, only 8.7 percent of local governments in the United States had their own Web sites (Eddowes 2003). An international survey conducted in 2000 on the extent of e-government at the local level was sent to nearly 3,000 local governments with populations greater than 10,000; only a little more than half (51 percent) responded. The results showed that 85.3 percent of the municipalities responding had a Web site and 57.4 percent had an intranet. Only 46 cities reported having had a Web site for longer than five years. Despite these encouraging results, the survey was less sanguine about local governments moving farther toward adoption of full e-government programs; only 114 cities (8.2 percent of respondents) reported having a comprehensive e-government strategy or master plan to guide their future e-government initiatives (Moon 2002).

The slow growth of e-government and knowledge management among local governments has been echoed by a number of studies that report a local perception that investments in the technology do not result in commensurate positive gains in productivity and performance. The redistribution argument states that IT may not improve the productivity of the entire public sector; rather, it only redistributes benefits within government, such as giving one organization a competitive advantage. Poor measurement, the most commonly reported reason, refers to the use of labor productivity measures that measure only the number of outputs, not their quality. The lag in time required for an organization to receive full benefit from its investments in IT may be because such investments often require extensive restructuring of workflow and infrastructure before full benefits are seen. Additionally, not all workers may participate in the use of the IT at the same time; some administrators and workers will remain emphatically computer illiterate.

This leads to the last argument, that investing in IT will not by itself improve productivity. Training and a cultural change are often needed. Moreover, the investment may be larger than actually needed, thus contributing to poor results. After studying data from all fifty states, Lee and Perry concluded that, although IT does have a positive impact on economic performance (as measured by gross state product), alone, it was not found to significantly increase agency productivity. Far greater economic benefits appear to accrue to those organizations who marry information and communi-

cations technology with knowledge management theory to build knowledge management systems that synergistically magnify the benefits of each item (Butler et al. 2003).

Conclusion

KM is a set of processes, practices, and management philosophies that exist to collect, process, store, and make available the organizational knowledge that enables government agencies to be more proficient and competitive in the delivery of public services.

KM and knowledge management systems (KMS) may be the latest manifestation of governments' concerns with data, information, and knowledge. This interest began in the late 1950s and 1960s with the growth of large-scale adoption of data processing with mainframe computers and batch processing. By the 1970s, a few organizations were employing internally developed Executive Information Systems (EISs). These, in turn, evolved into a variety of management information systems and commercially available EIS products. By the late 1980s, the reinvent government effort allowed government leaders to take advantage of the widely available computer capabilities in government agencies to introduce private-sector management practices into government, including total quality management, performance appraisals, and cost controls.

Reinventing government evolved into the e-government initiatives of the early years of the new century. At the same time, government agencies began to adopt the knowledge management practices being adopted by knowledge industries. In just a few years it became increasingly apparent that the information technology industry was driving knowledge management. IT was recognized as only one aspect of KM; other components include people, systems, and organizational cultures. Federal agencies were required by the Enterprise Architecture Act of 2002 to complete self-assessments of their IT uses and perceived needs. The goal of the assessments was to reduce IT costs by the greater use of common standards and collaboration whenever possible. By 2005, most of the building blocks for KM were readily available or already in place.

Several reasons for the apparent differences in the way the private and public sector function include: basic environmental factors, the ways in which sector organizations interact with their environments and with their stakeholders, and differences in organizational structures and processes. Because public organizations are insulated from market pressures, they are not as influenced by rewards and punishments exercised by market controls.