14

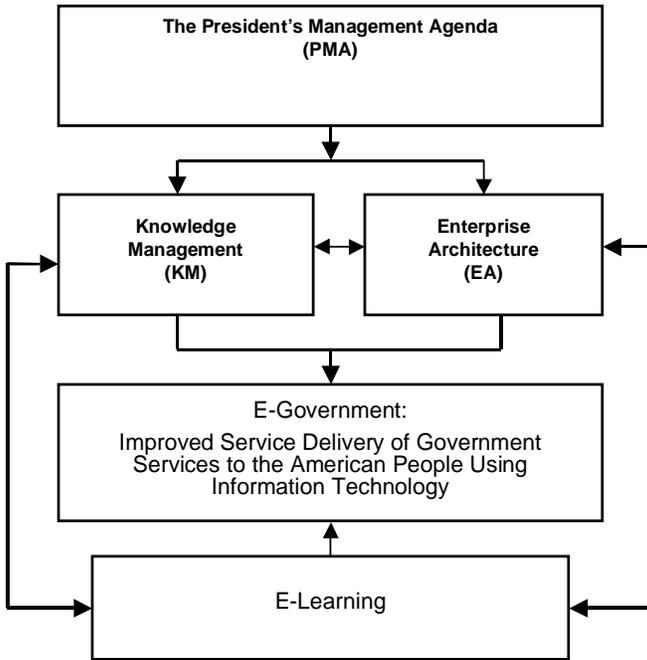## Conclusion: Knowledge Management's Role in the Drive to Transform Government

By 2006, four separate administrative policy themes had come together to shape a far-reaching movement with the objective of bringing greater cohesion, responsiveness, accountability, and overall improved performance to governments in the United States and elsewhere. These four management concepts included (1) implementing a business-driven approach to government administration; (2) forging an organizational culture that honors knowledge acquisition and sharing; (3) acceptance of a commitment to control the acquisition and use of information and communication technology; and (4) bringing a greater transparency, accountability, and accessibility in all government activities. These concepts are incorporated into the broadly based approach to transforming the federal government that is spelled out in detail in the 2002 President's Management Agenda (PMA).

The discussion in this chapter was inspired by federal agency representatives' presentations at federal e-government conferences over a period of several years, and from readings in government reports and professional and academic monographs. A framework for the chapter was suggested by a U.S. General Accounting Office (GAO) report presented to Congress in October of 2003: *Electronic Government: Potential Exists for Enhancing Collaboration on Four Initiatives.* The four PMA initiatives and their respective federal agencies—selected from twenty-five cross-agency e-government initiatives—in the GAO's collaboration study included e-payroll (Office of Personnel Management), Geospatial One-Stop (Department of the Interior), Integrated Acquisition Environment (General Services Administration), and the Business Gateway (Small Business Administration).

This chapter looks at four closely related transformational initiatives also promoted in the PMA: knowledge management, enterprise architecture, e-

Figure 14.1   **A Model of the Forces Shaping Transformation in Government**

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┌─────────────────────────────────────────────┐
│        The President's Management Agenda      │
│                   (PMA)                        │
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└─────────────────────────────────────────────┘
                        │
          ┌─────────────┴─────────────┐
          ▼                            ▼
┌──────────────────┐        ┌──────────────────┐
│    Knowledge      │◄──────►│    Enterprise     │
│   Management      │        │   Architecture    │
│      (KM)         │        │      (EA)          │
└──────────────────┘        └──────────────────┘
          │                            │
          └─────────────┬─────────────┘
                        ▼
┌─────────────────────────────────────────────┐
│               E-Government:                    │
│    Improved Service Delivery of Government     │
│     Services to the American People Using      │
│            Information Technology              │
└─────────────────────────────────────────────┘
                        ▲
┌─────────────────────────────────────────────┐
│                  E-Learning                    │
└─────────────────────────────────────────────┘
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government, and e-learning. A model illustrating the interconnectedness of the four concepts is presented in Figure 14.1.

IT: The Unifying Element

Clearly, the unifying element in all of these transformation forces is the government's policies toward the use of information and communication technology (ICT). In fact, without the widespread application of ICT, e-government, e-learning, and knowledge management would not be possible. The federal government's dependence upon ICT was succinctly noted in the Whitehouse report on the third anniversary of the E-Government Act:

> The United States Government is one of the largest users and acquirers of data, information and supporting technology systems in the world, currently investing approximately $65 billion annually on Information Technology (IT). The Federal Government should be the world's leader in managing technology and information to achieve the greatest gains of productivity, service and results. (U.S. OMB 2005c)

PMA: The Transformation Policy Directive

The President's Management Agenda is the engine driving implementation of the initiatives and the programs they are spawning. As with all of the elements in the PMA, these initiatives are designed to help make government more transparent, efficient, accountable, and accessible. Because the PMA plays such an important role as the force for transformation, a brief review of its scope and content is presented prior to the individual elements. The objective of the chapter is to show how the four integrative management initiatives contribute as a whole to transforming the way our society is governed.

In the United States, the set of directives, policies, and procedures included in the PMA were designed to serve as a broad restructuring plan for reforming the way the U.S. government functions. Key objectives for the PMA include making the federal government (1) citizen-centered rather than bureaucracy-centered; (2) more results-oriented; and (3) market-based in its operations. This last objective referred to actively promoting—rather than stifling—innovation through competition (OMB 2002).

The PMA focuses on five government-wide and nine agency-specific goals, all of which are designed to improve management at the federal level. The five government-wide goals are: (1) strategic management of human capital; (2) competitive sourcing; (3) improved financial performance; (4) expanded electronic government; and (5) budget and performance integration.

These five goals are all interconnected and are continually being improved. One way this improvement is taking place is by requiring implementation of a federal *enterprise architecture* (EA) plan in every federal agency and department. Many of the programs included in the PMA have also been adopted at the state level—with varying levels of success. Knowledge management, the federal enterprise architecture initiative, e-government, and e-learning/e-training are examples of these transformation initiatives. State adoption of enterprise architecture initiatives is discussed in this chapter.

E-Government

The core outcome sought for this paradigm shift is the ongoing drive for the management and delivery of government services online—the process known as *digital government* or simply *e-government*. The General Accounting Office's definition of e-government is:

> The term "electronic government" (or e-government) refers to the use of information technology (IT), particularly Web-based Internet applications,

to enhance the access to and delivery of government information and ser-
vice to citizens, to business partners, to employers, and among agencies at
all levels of government. (U.S. GAO 2003b)

Thus, e-government refers to a variety of government programs associ-
ated with the application of technology and information to accomplish the
greatest possible gains in productivity, service, and results. This plan to ex-
pand e-government is one of the key outcomes planned for in 2002 President's
Management Agenda, and therefore is a central product of the four initia-
tives discussed here. Overall, the underlying objectives of e-government con-
tinue to be achieving greater operational savings, better program results, and
better delivery of services (U.S. OMB 2005d).

The Bush administration's e-government program is off to a good start;
by 2006, improvements facilitated by the E-Government Act of 2002 were
being experienced both by citizens and throughout the government. In
the tax filing season, for example, 5.1 million citizens filed tax returns
online using the no-cost IRS Free File. In other activities, more than 17,000
grants applications had been received electronically; disaster manage-
ment interoperability services were used in 111 disasters and 624 train-
ing exercises; and federal job seekers had filed more than 1,900,000
resumes online.

Comparing overall goals with actual agency results give a mixed picture
of how well implementation of the federal enterprise architecture is progress-
ing. While all 25 agencies assessed had a mature enterprise architecture plan
in place and more than expected had an acceptable business case (84 percent
compared to a goal of 75 percent), many of the agencies had not meet OMB
targets for 2005. The OMB's goal was 90 percent of all federal IT systems
certified and accredited. However, only 85 percent of the agencies met that
target. The goal of 90 percent of government agencies with certified IT sys-
tems was replicated for 2006.

Half of the identified gaps in the IT workforce were also targeted to be
filled in 2005, with the same target identified for 2006. In addition, at least
50 percent of the federal agencies were to be able to manage their IT portfo-
lios in accordance with the OMB earned value management standard. How-
ever, only 28 percent of agencies had fully implemented earned value
management, with another 52 percent having implemented some parts of it.
Again, the goal for 2006 remained at 50 percent of agencies having fully
implemented the earned value management requirement.

To improve the development and use of common solutions across the fed-
eral government, the Office of Management and Budget (OMB) has devel-
oped e-government implementation plans with each agency to promote and

monitor their adoption and utilization of government wide solutions in order to avoid unnecessary redundant systems.

One of the most visible accomplishments to citizens was the development of a single-site entry point for accessing federal agencies; this was the PMA's *firstgov.gov* website. Through this website it became possible for citizens to change their address and file taxes online, as well as to access information from nearly all agencies branches of the federal government. The website received more than 6 million visitors per month in the first half of 2006.

Now that many agencies' enterprise architectures plans and analyses are beginning to mature, the federal government is exploring the opportunity to develop one federal enterprise architecture framework for use by all agencies. The problem, however, is that different agencies have used at least four major frameworks. While the difference between those frameworks is limited, a translator will be necessary to harmonize different frameworks' terminology, thus defeating one of the chief purposes of the exercise.

As the preceding chapters illustrate, the knowledge management initiative is one of the key products and management philosophies that federal administrators are employing to help bring about government transformation. Although it has already been discussed in some detail, the need for changing the culture of an organization before KM can function is discussed briefly below.

KM and the Needed Culture Change

A key integrating force is the knowledge management (KM) movement—itself one of the more recent of the procedures adopted from the public sector and the chief topic of this book. As we have seen in the earlier chapters, knowledge management involves a management philosophy and set of processes and procedures for collecting information about an organization's practices, processes, strategies, and programs. KM also integrates into an organization programs designed to collect, process, store, and disseminate needed internal and external information or organization stakeholders. KM includes developing and fostering a culture of knowledge sharing rather than hoarding. Finally, the KM activity in organizations includes administering data warehouses and supporting and developing knowledge workers through such methods as communities of practice, enterprise portals, story-telling, and other activities. KM has become particularly important in light of the extensive loss of knowledge expected to occur with the waves of retiring government workers expected over the next decade.

Figure 14.2 is a schematic representation of the basic structure of the

Figure 14.2   **KM in the Federal Enterprise Architecture Reference Model (FY07)**
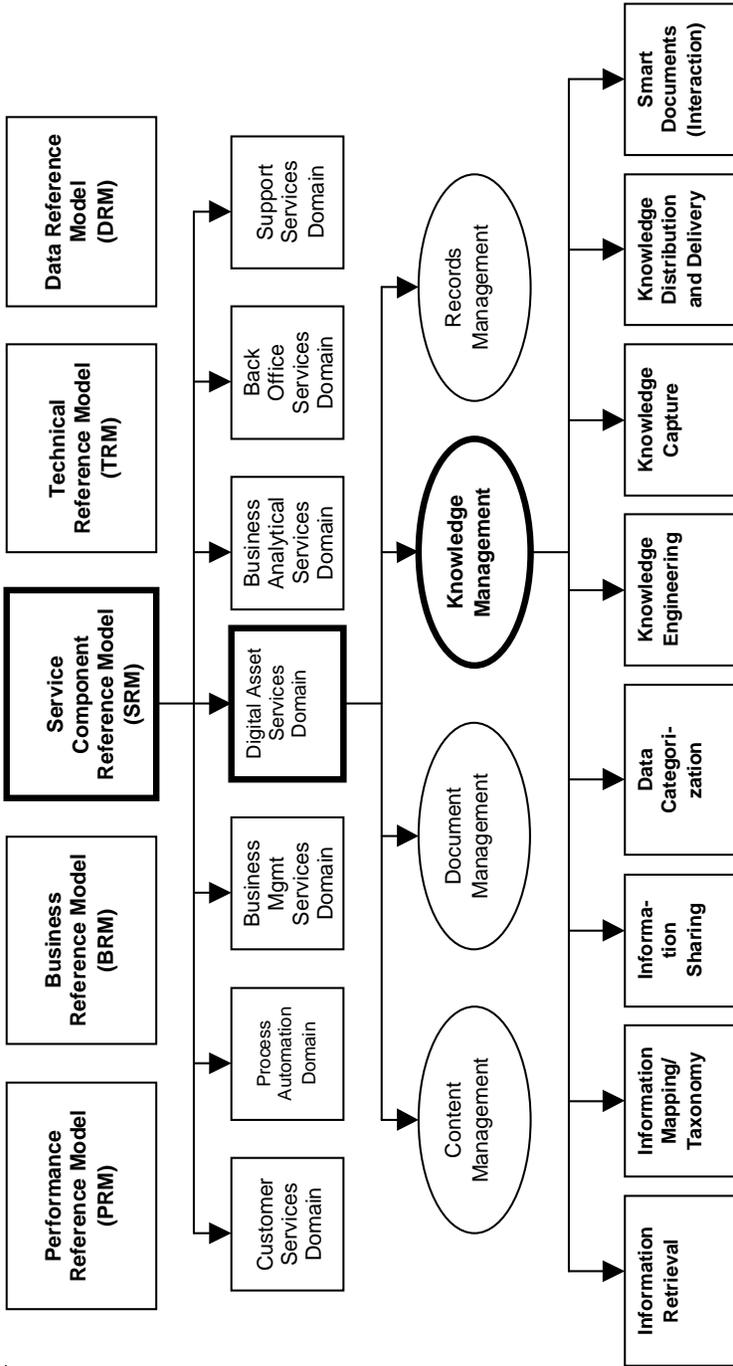
Federal Enterprise Architecture (FEA) initiative. It is included here because it shows where the government's knowledge management activities fall in this important management transformation program. FEA is constructed around five interrelated core elements: a Performance Reference Model (PRM), a Business Reference Model (BRM), a Services Component Reference Model (SRM), a Technical Reference Model (TRM), and a Data Reference Model (DRM).

Each of the five reference models incorporates a number of different "domains," or business activities under its umbrella. For example, the Services Component model covers the following domains: customer services, process automation, business management services, digital asset services, business analytical services, back office services, and support services. Each domain then frames a distinct set of "capabilities" or tasks that contribute to achieving the mission of that domain. For example, four capabilities are included in the Digital Asset Services Domain: content management, document management, knowledge management, and records management. The eight primary functions or responsibilities that are considered to be knowledge management capabilities are displayed in the bottom tier of Figure 14.2.

To summarize, the federal government's knowledge management functions and processes are one of the four capabilities in the Digital Asset Services Domain, which is one of the seven domains included in the Services Components Reference Model (SRM), which is one of the five reference models that make up the Federal Enterprise Architecture Program.

The objectives of the management agenda initiatives are simple and easy to understand. Moreover, many of the implementation elements have been carefully specified by the OMB and other agencies. Successful implementation of these initiatives has involved a significant change in the organizational cultures of public sector (and indeed private sector) organizations—in particular, changes in the mindsets, assumptions, and habits of legions of managers and employees. Careful architectural design and technical requirements planning alone are not enough (McNabb and Barnowe 2006).

The organizational culture model most conducive to successful knowledge management is the learning organization (Senge 1995). Learning organizations, with their focus on knowledge sharing and continuous learning, are the antithesis of large bureaucratic-mechanistic organizations, which are inherently oriented toward operational efficiency and control. In bureaucracies, information is concentrated at the top—the very stereotype of many public sector organizations, at least in the past. As Daft (2004) has noted, the changes in organization shape and design associated with learning organizations "require new values, new attitudes, and new ways of thinking and working together. A learning organization cannot exist without a

culture that supports openness, equality, adaptability, and employee participation" (421).

Changes in organizational cultures are notoriously difficult, especially where existing cultures are entrenched (McNabb and Sepic 1995). For some public sector organizations, changes of this type and magnitude would be transformational, not simply incremental. Nonetheless, researchers in countries as diverse as Brazil (Guimaraes et al. 2001), Bulgaria (Pavlov and Katsamunska 2004), Canada (Lawrence 1998), El Salvador (*Conectándonos al Futuro*, 1999), and the USA (Apple 2000) are beginning to extol the benefits of the learning organization model for public-sector organizations (McNabb and Barnowe 2006).

Successful adoption and implementation of such public-sector operating initiatives as knowledge management, enterprise architecture, e-government, and e-learning requires that public-sector organizations embrace even more complex changes—and address the need for transformative changes to their organizational cultures. That many public-sector organizations already have set goals to become learning organizations will provide rich opportunities for public administration research in the years to come.

Enterprise Architecture

The federal enterprise architecture framework (EA) is one of the chief forces helping to make the transformation of government possible. The EA concept involves a comprehensive overview of an agency's operations, the technology it uses and plans to add in order to conduct those activities, and the strategies it follows as it strives to achieve its mission. According to the National Association of State Chief Information Officers (NASCIO 2005, 3), EA involves following a "disciplined, or *management engineering,* approach" to the act of running a government agency. Management engineering refers to constructing the organization so that it has the tools, technology, and people to accomplish its mission despite potentially catastrophic changes in its environment.

The enterprise architecture concept is not a new one; it was introduced in 1987 by former IBM engineer John Zachman as a tool for managers to organize their organizations and integrate their IT systems (Ruby 2004). Zachman came up with what he termed an underlying "Enterprise Architecture Framework" to serve as a guide for managers in integrating IT into the business. However, Zachman soon concluded that the framework he had developed for designing IT systems could also be used to organize an entire enterprise, and was applicable for both public- and private-sector organizations. Thus, he saw that the architecture could be a framework for identifying and design-

ing the "set of guidelines, policies, models, standards, and process that, aligned to business strategy and information requirements, guides the selection, creation and implementation of solutions that are aligned with future business direction" (Zachman 1987, 1).

Zachman's enterprise architecture framework consisted of 36 data points in a six-by-six matrix. The six areas of the business are (1) the objectives and/or scope of the enterprise; (2) a model of the enterprise—the *business architecture*; (3) the IT architecture; (4) a technology architecture; (5) detailed program design; and (6) facilities and personnel architecture. Architecture planners must come up with answers to these question areas for each of the enterprise areas: Data (what), function (how), network (where), people (who), time (when), and motivation (why). When completed by agency personnel, the EA can serve as "a blueprint for designing and implementing information technology solutions to serve current and future business functions. It can enhance coordination, reduce diversity, promote data sharing, and boost efficiency in the development of business [i.e., agency] solutions" (Leganza 2005).

Enterprise Architecture in Government

The Federal Enterprise Architecture (FEA) initiative includes a number of management policies and procedures that were not in Zachman's 1987 approach. The FEA requires agencies to identify architectures for at least these following management tasks and responsibilities (NASCIO 2005):

- Technology architecture
- Project management
- Architecture program management
- Security architecture
- Internal enterprise architecture consulting
- Data architecture
- Process architecture
- "Business" architecture, and
- Enterprise performance management

Initially, the goal for implementation of the federal enterprise architecture initiative focused on increasing efficiency, controlling IT costs, developing and implementing common solutions, and following up on the responsibilities of the E-Government Act of 2002. This also meant improving their electronic security and building an effective IT workforce. OMB evaluates performance on these program metrics: budget and performance, competi-

tive sourcing, expanded electronic government, improved financial performance, and strategic management of human capital (U.S. OMB 2002).

The FEA has far reaching ramifications, touching on almost every federal government management activity, as the following statement by the association of state chief information officers attests (emphasis in the original):

> Enterprise architecture is not an end in itself. Rather, it is the path to *government transformation.* And, government will need to adopt an iterative change management process in order to identify, understand, and respond to current and future increasingly *complex* demands and needs. The requirements for improved government performance, reduced spending, and greater accountability to the citizens calls for smarter management—which includes the adoption of EA. (NASCIO 2005, 3)

The federal government has come a long way since 2002 in implementing the federal enterprise architecture, but there is still much work to be done—and even more work required at the state government level. As part of the PMA's objective to improve federal management, the Office of Management and Budget (OMB) measures the progress of each federal agency and department every quarter. Results are reported on OMB's "balanced score card." The measurements compare an agency's achievement against where approved goals indicate it should be. Results are reported on the scorecard as a "stop-light" with red, yellow, and green symbols making it easy to see which agencies are achieving the goals and which are not. A green score indicates the agency is achieving its goals; it is the highest rating possible. A yellow score indicates needs for greater efforts, while a red score signals that the agency is in real danger of not achieving the planned objectives (Weigelt 2006).

Enterprise architecture is obviously of great focus in the federal government and significant results have already been accomplished. But what about the individual states? Are they working just as hard on implementing enterprise architecture?

Enterprise Architecture at the State Level

While enterprise architecture requirements are close to being fully implemented at the federal level, many of the program's components are also being implemented at the state level. To determine the level of implementation by the states, in August 2005 NASCIO conducted a census to find out how far the individual states have come in adopting enterprise architecture. The results of that survey, published in October 2005, listed results from 37 states

and the District of Columbia—a response that represented more than 80 percent of the U. S. population.

The survey found that the states have made significant progress toward adoption of enterprise architecture since 1999, when the last survey was done. Key results include that 95 percent of the states had adopted some level of enterprise architecture; 71 percent believed it necessary to have dedicated enterprise architecture staff; and 92 percent believed it necessary to have a defined process for enterprise architecture. However, most of the states' emphasis had only focused technology architecture, although a minority of states had broadened their architecture to include business architecture, performance management, and process architecture.

Approximately 85 percent of the states responding to the NASCIO survey had adopted technology architecture; nearly 70 percent had adopted program management architecture; and close to 65 percent had adopted architecture program management. A somewhat surprising find is that only about 60 percent of the states have implemented security architecture. NASCIO finds it noteworthy that cyber security is a top priority for state CIOs, while the implementation apparently has fallen behind.

The survey also revealed that 70 percent of the states either had or planned to have full-time staff dedicated to managing the enterprise architecture program; 30 percent of the states have no plans to employ full-time staff to their enterprise architecture.

Enterprise Architecture: A Case Example

Washington State is typical of the states now beginning to implement enterprise architecture throughout its operations. The implementation process is under the direction of the State Department of Information Services (DIS). A complete statement of the state's e-government program is spelled out in a planning document published in February of 2000 (DIS 2000). Follow-on plans for managing the state's e-government program was released as an initial draft on September 7, 2005, as version 1.0 on September 21, 2005, and as version 1.1 on November 2, 2005. The plan discussed procedures for managing the state's enterprise architecture program and includes items such as program management principles, an architecture lifecycle, and program iterations and architecture releases.

To provide overall guidance and oversight, the state's Information Services Board (ISB) has established an Enterprise Architecture Committee (EAC). The mission of the EAC is:

> [T]o build and maintain an enterprise architecture program that guides and optimizes state resources; enables agencies to meet their strategic goals;

facilitates the management of organizational and technological change and complexity; and helps agencies manage the state's IT resources as assets within its portfolio of investments." (ISB 2006)

As of 2006, Washington had standards for one initiative (networking architecture) established and three initiatives underway: Voice-over Internet Protocol (VoIP), integration architecture initiative, and a geographic information technology (GIT) initiative. A charter has been written for each initiative, but only the charter for the networking architecture networking standards initiative had been approved by the Enterprise Architecture Committee; charters for the other initiatives were still under development (DIS 2006). These initiatives were to be delivered by June 30, 2006, so that they could be used to make investment decisions for 2007 through 2009.

The purpose of the networking standards initiative is to develop policies, standards, and guidelines for network infrastructure solutions, assets, and services that are common statewide. The initiative seeks to evolve a set of early adoptions-components (Tier One) in the statewide Enterprise Architecture. The purpose of the Voice-over Internet Protocol (VoIP) initiative is to provide telephony tools that will assist agencies in making decisions about the deployment of Voice-over IP technologies. These tools focus on:

- Establishing a standard set of measures to assess agencies' technical readiness to implement Voice-over IP
- Establishing standard factors that agencies should consider in making a business case for implementation of Voice-over IP
- Defining standard features of Voice-over IP implementations and establishing potential standard techniques or protocols for implementing those features

The initial usage of these standards, guidelines, and solutions are to support the financial and administrative systems "roadmap" initiative. Information about the roadmap can be found at its website: www.ofm.wa.gov/roadmap.

The purpose of the state's integration architecture EA initiative is to simplify implementation of business capabilities and to allow state agencies to benefit from all agency IT capabilities. This initiative's intent is to support the integration of information systems between government agencies without compromise and wherever operationally and technically feasible. The infrastructure solutions established by this initiative will be documented within the statewide enterprise architecture's solution architecture. Standards and guidelines will be documented within the technology architecture. The inte-

gration architecture initiative also expects to establish information architecture components that are relevant to the integration of information systems. For example, this initiative expects to develop data modeling conventions and metadata, and standards for the representation of information as messages between systems.

Finally, a geographic information technology (GIT) initiative is planned to identify a standard approach for integrating all GIT systems in the state. This initiative is jointly sponsored by the ISB committees on enterprise architecture and geographic information technology (DIS 2006).

E-Learning

Closely related to the federal e-government mandate is the new *e-learning initiative*. Under its original title of "GoLearn.gov," this program was instituted under the Office of Personnel Management's *e-training imitative,* which was one of the first 24 e-government initiatives included in the PMA. The GoLearn.gov site was launched in July 2002 to make available a wide variety of free, high-interest, and agency-mandated courses. By the end of FY 2004, the site recorded 314,952 completed courses out of the 441,537 registrations since its beginning (U.S. OMB 2005d). The GoLearn.gov site was renamed the USALearning.gov to become "the official learning and development site for the U.S. federal government" (USALearning n.d., "Introduction"). USALearning has become the portal for access to all federal government e-training and e-learning products and services.

E-learning has roles to play in such PMA-directed elements as personnel management, knowledge management, information architecture, and e-government. Thus, it is also coming to be seen as an important tool for implementing and maintaining the momentum of government transformation.

According to Al Corbett, a U.S. Department of Energy spokesman, the original goals for the e-learning/e-learning initiative are:

- To support and move forward the PMA by unifying and simplify e-training programs across all government agencies.
- To improve the efficiency and effectiveness of government operations by providing training as and where it is needed.
- To support federal agency human capital initiatives by leveraging existing e-training resources.
- To serve as a focal point for e-training access across agencies.
- To aid in the transformation of government by providing learning opportunities to all employees.
- To push lifelong learning as a strategic goal, improving agency ability

to react to changes and challenges, and become more cost effective in the performance of their services. (Corbett 2002)

By 2006, these goals had been amended to go beyond just offering e-training courses as the following OPM statement attests:

> The goals of the e-Training initiative extend far beyond offering e-training courses. The Gov Online Learning Center is evolving into an online learning center of excellence focused on easily accessible, high quality learning and performance support. In addition to the myriad e-training course and e-mentoring offered through GoLearn [now USALearning], employees can obtain targeted learning objects on demand and make use of performance support tools for research and career management; supervisors and managers can use performance support tools to provide skill gap analysis and integrate into plans for the strategic development of human capital. (U.S. OPM 2006, n.d.)

Developments in the capacity, functionality, and declining cost of information and communications technology (ICT) have greatly increased access to and the availability of information for everyone (Dirr 1999). Moreover, ICT has shown itself to be an effective medium for delivering instructional content. ICT and the Internet have resulted in learning that is "constructivist, interactive, collaborative, learner centered, and just in time" (Wonacott 2002).

Both the rate and the extent of change occurring in the economic, social, and technological foundations of higher education delivery systems are increasing dramatically. In addition, the knowledge base in many disciplines is expanding so rapidly that it is almost impossible for most people to stay current in a field. At the same time, existing knowledge becomes obsolete often before it can be fully absorbed. Imparting information and sharing knowledge among government workers at all levels involves imparting practical experience with current e-government applications, including the ability to diagnose, prescribe, and monitor the design and application of solutions to management problems.

The E-Training Initiative was included in the 2002 President's Management Agenda to meet these challenges. The program is one of five e-government initiatives managed by the Office of Personnel Management.

E-learning is generally considered to be synonymous with distance learning (or distance education), with the terms often used interchangeably. However, this is not entirely correct. Distance education does not necessarily involve computers, the Internet, or any electronic media at all; e-learning

does. For most of its history, distance education meant correspondence courses, with student-teacher interaction taking place via the mails. E-learning, on the other hand, has been defined as a "process of delivering instructional material to remote sites via the Internet, intranet/extranet, audio, video, satellite broadcast, interactive TV, and CR-ROM" (Holsapple and Lee-Post 2006, 67–68).
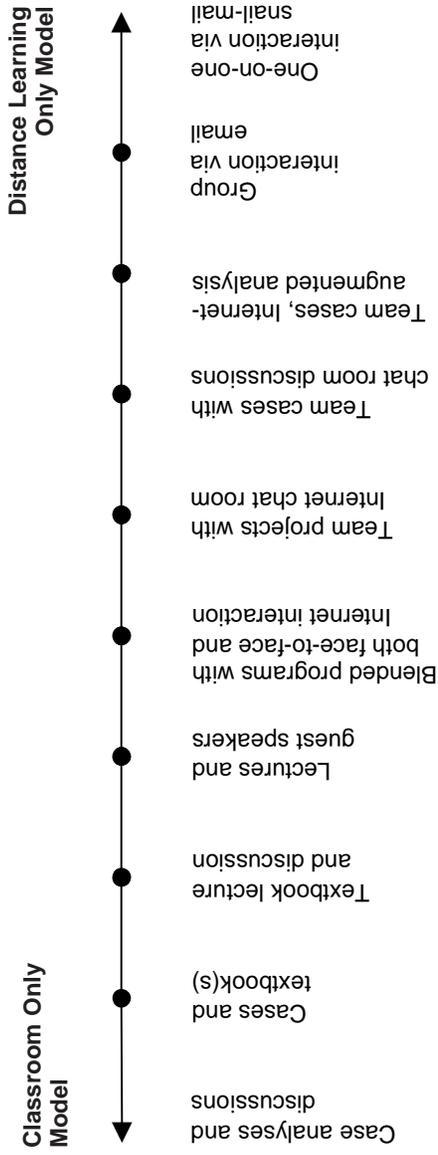
The Role of the Internet

The Internet has brought about significant changes in the way business, government, and education transfer knowledge. Today, organizations increasingly use such strategies as e-commerce, e-government, and e-learning to deliver content to their respective stakeholders. Personal computers, the Internet, and the World Wide Web have entirely reshaped the way that products and services are developed, produced, and delivered (Sternstein 2006).

The Internet is the chief component in many e-learning systems, resulting in what is often referred to as Internet-based, Internet-enhanced, or Internet-enabled learning. Internet-based instruction can take many forms. Figure 14.3 is an illustration of just a few of the many different approaches that are being used to deliver instructional content. In practice, however, distance learning programs appear to fall into two mutually exclusive camps, with a smaller number of schools providing more than one avenue for program completion (*Online University Directory*, www.online-university.us/mba-degrees-on-line.htm).

Instructional delivery systems range across this continuum, with traditional classroom-based systems at one pole and completely external delivery systems at the other. The exclusively distance-learning model is positioned at the opposite pole of the content-delivery continuum. This model may be defined from both an educational and a technological point of view. From the instruction view, e-learning is seen as the *use of print or electronic media to deliver instructional content when learners and teachers are separated in time and/or place*. From the point of view of technology, it has been defined as *the means of getting people together* (including through video conferencing) *in the same electronic space, thereby facilitating mutual learning* (Kerka 1996).

The combined models are sometimes collectively referred to simply as *e-learning*. They have been defined as "education created and delivered by using technologies related to (the) computer, the Internet and telephony, in combination or in isolation" (Chadha and Kumail 2002, 31). Clearly, if judiciously applied, distance or online learning is not a substitute for the classroom, but an extension of the classroom.

Figure 14.3 **A Continuum of Content Delivery Models with Illustrative Pedagogies**

Classroom Only Model

Distance Learning Only Model

Case analyses and discussions

Cases and textbook(s)

Textbook lecture and discussion

Lectures and guest speakers

Blended programs with both face-to-face and Internet interaction

Team projects with Internet chat room

Team cases with chat room discussions

Team cases, Internet-augmented analysis

Group interaction via email

One-on-one interaction via snail-mail

Source: MacDonald and McNabb (2006).

The central positions on the continuum employ many of the best components and pedagogies of both of the two opposite approaches. The use of the World Wide Web and the Internet are cornerstones in these combined approaches. These combinations benefit from the chief strength of the Internet by overcoming the barriers of time and space in teaching and learning. Moreover, they also maintain the important benefits that accrue from onsite learning by enabling face-to-face student/teacher interaction.

Whether it occurs in the classroom or at a distance, Internet-based instruction typically takes one or more of the following forms: (1) electronic mail, including delivery of course materials, assignments, giving and receiving feedback, participation in discussion groups, and other interactive activities; (2) electronic bulletin boards serving newsgroups and special-topic discussions; (3) student accessing and downloading of course materials, handouts, or tutorials; (4) interactive tutorials on the Web; (5) real-time, one-on-one or group interactive conferencing; (6) intranet websites with limited access; (7) sharing of online databases, catalogs, and other library information; and (8) sharing and/or contributing to research related to specific study issues or questions (Kerka, 1997).

Conclusion

This chapter examined four closely related transformational initiatives contained in the President's Management Agenda, comprehensive program designed to make the federal government more transparent, accessible, and better able to perform its many services. The four interrelated activities included in this drive for the transformation of government are knowledge management, enterprise architecture, e-learning, and e-government. This chapter has shown how closely each activity depends on what happens with the others, and how critical it is for all levels of government to coordinate their implementation.

The key integrating element in all of these initiatives is information and communications technology. Technology is one of the key pillars of knowledge management programs: enterprise architecture is all about how technology is planned and used in organizations, and without communications technology e-learning and e-government programs simply could not exist.

A key objective for the knowledge management initiative is to make sure that critical operational knowledge held by government workers is collected, shared, and retained. This often requires a major change in the culture of an organization. As large numbers of government worker retirements are expected from now through 2015, KM is becoming particularly important. As

the baby boom generation workers retire, without KM much of what they know about their agencies' functions typically leaves with them.

The enterprise architecture initiative has three chief objectives: to make all government information and communication technology systems compatible, to avoid duplication and waste in technology purchases, and to ensure the development and acquisition of the latest advances in technology. The federal government's implementation of a combined e-training and e-learning initiative is designed to provide continuous training and education to all government workers. Again, the training of new workers needed to replace large numbers of retirees in the next few years makes e-learning and KM critical requirements for all government agencies. E-learning is also necessary to help prepare current administrators by providing them with the management and technological skills they need to transform government.

Perhaps the most important concept to take away from this chapter and the book as a whole is that all the government's management initiatives are closely interrelated. It is not possible to design and implement a program to collect, archive, and share knowledge, for example, without also coordinating the program with a detailed enterprise architecture analysis and design to accomplish the many knowledge tasks. Once such a coordinated program is in place, implementing the necessary culture change and program actions will require establishing and implementing e-learning and e-training policies, procedures, and programs.

Public sector managers and administrators seeking to raise their e-government accomplishments to acceptable levels in their annual performance assessments need to address these programs as an integrated whole—with full recognition of the synergistic contribution that they can make together—in the mandated drive to transform the way our governments function. The far-reaching goal of e-government—to make it possible for all citizens to access most if not all government information and programs electronically—cannot be achieved without also completing the complimentary tasks incorporated into knowledge management, enterprise architecture, and e-learning.