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Office of Inspector General

Information Technology Audit

Knowledge Management at the Department of State: Learning from Successful Principles and Practices

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IMPORTANT NOTICE

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RESULTS IN BRIEF

Organizations increasingly are implementing knowledge management (KM) strategies to maximize the benefits of what they know to help improve the efficiency and effectiveness of their business operations. KM is a collaborative and integrative approach to creating, capturing, organizing, accessing, using, and reusing intellectual assets—to get the right information to the right people at the right time to support management and decision-making. The Department of State (Department) is working to coordinate its KM activities through the establishment of an Office of e-Diplomacy, which is responsible for ensuring that information technology (IT) investments meet the Department's needs, are consistent with the administration's e-government initiatives, and fully exploit existing networks and web technologies.

This report presents the results of the Office of Inspector General's (OIG) study of the Department's strategy for implementing KM through its Office of e-Diplomacy. Specific objectives of OIG's study were to evaluate the Department's plans and project management structure for coordinating KM initiatives and identify how effective practices from other federal, international, and private organizations can be applied to help strengthen the Department's KM approach. The scope and methodology for OIG's study are outlined in Appendix A.

RESULTS IN BRIEF

The Office of e-Diplomacy is working to develop its strategy for implementing KM Department-wide, which it expects to complete before summer 2003. The office has networked extensively with a range of public and private organizations to compile ideas on effective approaches to instituting KM in the Department. The office is undertaking a number of knowledge sharing initiatives, including greater use of existing classified and unclassified government networks for information exchange and collaboration, as well as the Group of Eight (G8) Knowledge Management Project.

In developing its Department-wide strategy, the Office of e-Diplomacy can benefit from the effective approaches and lessons that OIG gleaned from its study of the KM activities of other federal, international, and private organizations. Specifically, OIG identified five key principles and corresponding practices that exemplify the various aspects of KM. The five principles are:

- Recognizing the benefits of KM to the organization;

- Ensuring organization-wide support for KM;

- Appreciating the cultural factor in KM;

- Building KM Communities; and

- Using information technology in KM.

Noteworthy examples and case studies of successful KM activities illustrate how organizations carried out these principles and practices in real life. (See Appendix B.)

While providing useful ideas for developing a KM strategy, these principles and practices also serve to highlight the challenges the Department faces to successful KM implementation. The Department recognizes some of these challenges and has taken steps to address them, such as ensuring senior management oversight for KM. However, considering other barriers to effective KM and determining how best to overcome them will be key. For example, the Department still needs to identify business requirements, such as those of its core diplomatic functions, as a basis for formulating its knowledge sharing approach. Further, it needs to translate that planned approach into real-life implementation through community-building and IT tools, as well as ensure organization-wide commitment and a support structure for coordinating KM initiatives. A major challenge is to identify the cultural barriers to KM and determine how best to counteract them.

BACKGROUND

Department-wide efforts to institute KM began with the Foreign Affairs Systems Integration (FASI) project that, although unsuccessful, shows the pitfalls to avoid and provides a basis on which to pursue any subsequent knowledge sharing endeavors. The project was a Department-led effort to acquire and test an Interagency Collaboration Zone (ICZ), which is a standard system featuring a web-based portal, applications, and tools for improved communications, information sharing, and KM to support the U.S. foreign affairs community overseas. The project was undertaken pursuant to recommendations of the Overseas Presence Advisory Panel, which was instituted to assess U.S. representation and operations at its embassies and consulates world-wide.[1]

In a prior review, OIG evaluated the Department's strategy for establishing the interagency system under the auspices of the FASI program office within the Bureau of Information Resource Management (IRM). In November 2002, OIG reported that the initiative was at risk of not meeting the objectives of effectively supporting a decision on whether to proceed to global system deployment.[2] Specifically, OIG found that FASI did not adequately identify system requirements, consider alternatives, ensure interagency commitment, and conduct testing of the ICZ overseas. Because of these concerns, OIG recommended that, after completing the pilot test, the project be streamlined and redirected.

Early in 2002, the Office of the Under Secretary for Management expressed concerns about FASI similar to those that OIG reported. Newly appointed the previous year, the Under Secretary established an Information Technology Review Group to ensure that technology initiatives were in concert with the Secretary's vision for improved IT capabilities within the Department. In this context, the Office of the Under Secretary for Management reviewed a range of IT projects across the Department, including FASI, and engaged a consultant to lead a FASI review group to help explore his concerns. As a result of its research, the FASI review group identified problems similar to those that OIG reported regarding the project. In line with OIG report recommendations, in September 2002, the Office of the Under Secretary for Management announced plans to merge FASI with a

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[1] *America's Overseas Presence in the 21st Century*, Report of the Overseas Presence Advisory Panel (Nov. 1999).

[2] *The Foreign Affairs Systems Integration Project Needs Redirection* (Memorandum Report Number IT-A-03-02, Nov. 2002).

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related messaging system replacement initiative to maximize the Department's IT investments. In January 2003, the Department decided to discontinue the FASI pilot.

From a larger perspective, and in the context of these reviews, the Under Secretary also asked about the KM concept in general and how applying it might benefit the Department as a whole. The Under Secretary asked the consultant who had led the FASI review group to identify the Department's ongoing KM activities and map them to underlying requirements. The consultant was to review the Department's business functions, how KM was being applied, whether it was truly needed, and if so, what changes were necessary in the approach. The consultant also was to design a KM project—the G8 project—that could be operational in less than 90 days to meet business requirements.

After numerous interviews with employees across the Department, the consultant determined that KM constitutes a major part of the Department's business and should not remain under the purview of IRM, but should be transferred to a central office under the auspices of the Office of the Under Secretary for Management. This official, as well as a number of other officials and documents that OIG consulted, suggested that such an office would help the Department focus its attention on managing knowledge to address several business challenges, including:

- Capturing the knowledge of Foreign Service officers (FSO) to ease the transition of their replacements as they rotate positions at overseas missions every two to three years;

- Safeguarding against potential knowledge losses, when about 45 percent of the Department's 1998 workforce becomes eligible to retire by the end of FY 2006;[3]

- Overcoming current problems with antiquated, inefficient, and incompatible IT systems at overseas posts, which hamper FSOs from getting the information they need, when they need it, to conduct the Department's diplomatic mission; and

- Improving communications, collaboration, and knowledge exchange across the Department's decentralized organizational structure and among the Foreign Service's core political, economic, administrative, consular, and public diplomacy areas.

In June 2002, the Under Secretary for Management accepted these recommendations and formally established the Office of e-Diplomacy.

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[3] *Federal Employee Retirements: Expected Increase Over the Next 5 Years Illustrates Need for Workforce Planning* (GAO-01-509, Apr. 2001).

STUDY RESULTS

DEPARTMENT EFFORTS TO INSTITUTE KM

The Office of e-Diplomacy's mission is to enhance the Department's foreign affairs leadership by promoting a knowledge sharing culture and making new technologies readily available to help provide faster, more effective service to internal and external customers. This mission reflects the commitments of the Secretary and the Under Secretary for Management to putting secure and innovative systems at headquarters and overseas missions to support diplomacy in the new century, ensuring that the systems meet business needs, and making better use of the knowledge and experience resident in the Department.

In FY 2002, the Office of e-Diplomacy was given a budget of about $3 million to carry out its mission. With ambassador-level leadership, and staffed with ten Foreign and Civil Service employees with extensive diplomatic, policy management, and IT experience, the office represents a mix of employees from across the Department. The office is responsible for developing a long-term KM strategy and facilitating and coordinating ongoing KM activities in the Department. The office also collaborates with the Department's employees and managers, as well as external organizations, to identify effective KM approaches that will assist them in developing the strategy. Ultimately, the office is to develop training and career management opportunities to support implementation of the strategy and new KM initiatives.

The Under Secretary for Management directed the Office of e-Diplomacy to develop a long-term strategy and milestones for implementing KM Department-wide. The office strategy is expected to serve not only the Department, but also the collaboration needs of homeland security and the interagency community by facilitating the creation, sharing, and use of institutional information to achieve government-wide objectives. Along with the Department's e-government initiative, to which the Office of e-Diplomacy contributed significantly, KM is one of the key elements of the *President's Management Agenda*, which focuses on improving the management and performance of federal government operations.

E-Diplomacy Activities

As of May 2003, the Office of e-Diplomacy was still working to develop its strategy and tools for implementing KM Department-wide. E-Diplomacy officials said that they expected to complete the strategy before summer 2003. The office has conducted broad research and networked with a range of government organizations to gain a better understanding of KM and potential ways of applying it in the Department.

For example, e-Diplomacy representatives attend periodic meetings of the Federal Chief Information Officers Council's KM Working Group. This working group makes full use of the collective knowledge, experience, and abilities across government to compile guidance on the content management, processes, and technology needed for effective KM. With participation by more than 30 federal organizations, and having begun discussions with state and local groups on collaboration and knowledge sharing issues, the span of influence of the group is quite large. The Office of e-Diplomacy also participates in periodic conferences or forums sponsored by industry and academic organizations.

The Office of e-Diplomacy has implemented several initiatives to promote KM within the Department. For example, it has established an Intranet site, which provides information, Internet links, and other resources to assist employees interested in learning more about knowledge sharing tools and techniques. The office has posted a survey to the site, offering an electronic means for employees world-wide to submit their views on collaborative tools and techniques that might be useful to help increase efficiency in their daily work. In March 2003, e-Diplomacy officials told OIG that they had received over 600 survey responses, highlighting the critical need for electronic means of communication and collaboration among foreign affairs agencies at overseas missions. In conjunction with IRM's business center, the office has provided software that is tailored to support classified information exchange and knowledge sharing by Department bureaus and missions worldwide. The office also hosts a weekly luncheon in the Department's headquarters cafeteria, providing an opportunity for employees to meet to ask questions and raise issues regarding knowledge sharing requirements and strategies.

Other Ongoing KM Initiatives

One of the foremost objectives of the Office of e-Diplomacy has been to survey the ongoing KM initiatives and systems already in the Department. E-Diplomacy officials concede that the initiatives identified so far are generally the most visible ones, which in some instances only vaguely incorporate knowledge

sharing characteristics. These initiatives provide a preliminary basis on which the office can build to accomplish its Department-wide KM goals. The demonstrated benefits of these ongoing KM initiatives can help spur enthusiasm and support for launching additional projects to address other knowledge sharing needs as they are identified. Coordinated implementation of the KM initiatives can also help enhance the individual projects themselves by allowing their managers to build from each other's successes and lessons learned. In addition to the FASI project discussed above, the following are several knowledge sharing projects and activities that both OIG and the Office of e-Diplomacy identified. The Office of e-Diplomacy is working to learn from, cooperate with, and in some instances assist these activities.

Center for Administrative Innovations

Of the various initiatives identified, the Bureau of Administration, Center for Administrative Innovations (A/CAI) has the most comprehensive KM approach in the Department. Established in July 2001, A/CAI is to champion new ways of improving services and systems to support administrative personnel and their customers both domestically and overseas. The center uses various methods to compile and share information on how to make the Department's administrative operations "best-in-class." For example, it networks with federal agencies, such as the General Services Administration and the Departments of the Army and the Navy, to glean information on effective strategies for improving administrative service. A/CAI representatives also attend conferences hosted by private KM organizations to leverage new knowledge sharing tools and techniques. A/CAI brings together bureau employees in conferences and workshops focused on pursuing efficiencies and cost savings in administrative service. A/CAI's key themes for administrative innovation are good ideas, trends, outreach, and business transformation.

State Messaging and Archive Retrieval Toolset

The Office of e-Diplomacy is overseeing the collection of user requirements for developing the State Messaging and Archive Retrieval Toolset. One of the Secretary's highest priorities for improving management in the Department, this messaging project will leverage modern technology to support the conduct of diplomacy. Currently, the Department relies on disparate processes, procedures, and systems, such as cable, fax, and e-mail, for creating and exchanging information. Over the next two years, the Department will replace its outdated telegram and e-mail technology with a secure, state-of-the-art, web-based system for han-

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dling virtually all types of Department documents. Through the new, centrally managed system, employees will use standard web browsers to access a single repository of electronic documents from anywhere in the world. Department users will benefit from a global directory and portable, personal identification. The system will also include remote access and powerful search and retrieval engines.

The messaging project office is using KM practices to determine the best approach to system design and implementation. A Messaging Steering Committee, created by the Under Secretary for Management in April 2002 and comprised of senior managers and technical representatives from the Department's core functions, meets periodically to consider requirements and alternative tools and techniques for addressing Department-wide messaging requirements. In coordination with the Messaging Task Force, the Office of e-Diplomacy has engaged consultants to conduct a user evaluation of the messaging system prototype.

Open Source Information System

The Office of e-Diplomacy has helped negotiate wider Department participation in the Open Source Information System, a sensitive but unclassified network for web-based knowledge sharing and information exchange within the U.S. intelligence community. Over 50 major federal organizations, including the Department's Bureau of Intelligence and Research, connect to the network. The system is used to manage and share "open source" information (e.g., conference proceedings, technical reports, media literature), which is generally available to the public, even though its distribution is limited. More than 35,000 users can access the system via local dial-up calls from work, home, or temporary duty locations in the United States and 87 countries world-wide. The system has a rich infrastructure and a potential for growth as boundless as the Internet it accesses. Increased access to the network is a major step forward in connecting the Department to other agencies' systems, which is crucial for homeland security and foreign affairs collaboration.

The Office of e-Diplomacy chairs an interagency working group that is exploring ways to expand collaboration via the Open Source Information System. Under e-Diplomacy's direction, a suite of Department administrative services identified by foreign affairs agencies as high priorities has been made available through the system. Moreover, the Office of e-Diplomacy has supported efforts to use the Open Source Information System as a means of connecting the Immigration and Naturalization Service to the Department's consular affairs database, which is important for homeland security. Similarly, the Office of e-Diplomacy is pursuing

greater use of existing classified government networks for information exchange and collaboration as well.

G8 Knowledge Management Project

The G8 is comprised of major developed nations—Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States. The G8 Knowledge Management Project was created in response to the Under Secretary for Management's interest in demonstrating a KM initiative that could be designed and implemented within a relatively brief period of time, and at a relatively low cost, to support an established business practice. The focus of the project has been the development of a KM web site that centrally provides information and services to support those working on G8 issues within the Department. This web site will ultimately link to the sites of other international organizations with which the Department collaborates on G8 matters.

Collaborative Application Technology Solutions Forum

IRM's Systems and Integration Office leads this Department-wide performance enhancement initiative, which is aimed at integrating and improving the use of process-driven technology solutions to meet the needs of bureaus, offices, and overseas missions. The focus of the initiative is on informal meetings where applications developers share information, address common challenges, and seek synergy among their current and future IT projects.

E-DIPLOMACY CAN BENEFIT FROM THE EFFECTIVE KM PRACTICES OF EXTERNAL ORGANIZATIONS

With establishment of its Office of e-Diplomacy, the Department has made a good start in promoting KM to support the accomplishment of its foreign affairs mission. To ensure effectiveness, however, the Department can benefit from considering the successful KM practices, experiences, and lessons learned of other organizations. From its study, OIG identified five key principles and corresponding practices that the Department can adapt and apply, as appropriate, in instituting its framework for KM.

Specifically, OIG found that effective KM organizations appreciate KM's potential for improving business operations. Senior managers in these organizations are committed to ensuring that office units support efforts to facilitate horizontal cooperation and communications. Recognizing the cultural barriers to implementing KM, effective organizations devise strategies to overcome them. These organizations have identified and assisted communities already engaged in knowledge sharing, and they have established additional communities that could benefit from KM. Further, recognizing that IT enables KM communities to grow and thrive, these organizations have identified and implemented the tools and technologies needed to support it.

Table 1 provides an overview of the five key KM principles and related practices. The table is to serve as a composite guide for the reader and facilitate understanding of the more detailed discussion of the principles and practices, along with illustrative case studies, provided in Appendix B.

Table 1: Successful KM Principles and Practices

PRINCIPLE I:	PRINCIPLE II:	PRINCIPLE III:	PRINCIPLE IV:	PRINCIPLE V:
Recognizing the Benefits of KM to the Organization	**Ensuring Organization-wide Support for KM**	**Appreciating Cultural Barriers to KM Success**	**Building KM Communities**	**Using Information Technology in KM**
Practices: • Understanding the KM concept • Recognizing the benefits of KM • Identifying critical business needs as a basis for KM • Appreciating different approaches to applying KM • Managing and measuring KM results	Practices: • Securing executive-level support and sponsorship • Designating a focal point for KM • Providing funding and staff resources • Documenting KM directions	Practices: • Understanding cultural hindrances to KM • Overcoming cultural barriers	Practices: • Defining and identifying KM communities • Supporting KM communities • Fostering innovative community activities	Practices: • Understanding the role of IT • Choosing the appropriate technology • Managing and sustaining IT and data

CHALLENGES TO IMPLEMENTING KM IN THE DEPARTMENT

Since its inception, the Office of e-Diplomacy has taken a number of actions in line with the effective KM principles and practices that OIG identified from its study of external organizations. The following is OIG's assessment of the progress made and the challenges that the Office of e-Diplomacy still faces to implementing KM Department-wide. The office should consider these challenges and the suggestions for overcoming them as it completes the development of its long-term KM strategy to present to senior management.

Recognizing the Benefits of KM within the Department

The establishment of the Office of e-Diplomacy demonstrates the Department's recognition of the potential benefits in implementing KM to help improve the effectiveness of its conduct of diplomacy world-wide. E-Diplomacy officials believe that their studies of ongoing internal and external KM initiatives provide a sound basis for moving forward with planning for KM implementation. However, the office still faces challenges in translating KM concepts and ideas into a comprehensive approach that is realistic for the Department.

The Department needs to determine its specific knowledge sharing requirements and what it seeks to accomplish through implementing KM. Only then can the Department identify the most appropriate strategies for instituting KM, building on its own studies and the examples OIG found and described in the five principle areas. (See Appendix B.) Further, the Department will have to determine how to monitor performance and measure results to demonstrate the impact of those KM strategies, which will be critical to ensuring support Department-wide.

Ensuring Department-wide Support for KM

The Under Secretary for Management has provided for central advocacy and oversight of Department-wide KM activities by establishing the Office of e-Diplomacy. The director of e-Diplomacy is also the Department's chief knowledge officer and has clear responsibility for enhancing the Department's foreign affairs leadership by fostering a culture that embraces knowledge sharing and technological innovation. Staffed with representatives of the different employee functions from across the Department, the Office of e-Diplomacy is to ensure a business focus for KM, in contrast to the FASI approach discussed above.

However, the office first needs to be made permanent so that it can continue to function effectively to carry out its mission. Though allocated 12 staff positions, the office has only been able to recruit ten full-time employees. Further, as a proof-of-concept operation, its employees were assigned for one-year basis and the office is now at a point where personnel are being reassigned, creating resource constraints. Only after the office is made permanent will it be able to compete for the personnel and the funding it needs to be an effective force in promoting KM Department-wide.

Making its KM voice heard and accepted at the highest levels of the Department remains the sticking point for the Office of e-Diplomacy as well. The support of senior management will be critical, especially given the anticipated cultural resistance to adopting KM within the Department. Officials told OIG that the Secretary is committed to IT improvements and has placed priority on the efforts of the Office of e-Diplomacy. Whether through mandate or policy direction, senior management's commitment to knowledge sharing will need to be communicated to promote KM at all levels within the Department. Then, e-Diplomacy officials will have the backing and influence needed to ensure that other managers from across the bureaus, offices, and overseas missions follow suit. Where the managers themselves adopt KM terminology and model knowledge sharing behaviors, their employees will be encouraged to participate in or introduce new KM initiatives. As the Office of e-Diplomacy demonstrates the success of small KM projects and works incrementally toward larger knowledge sharing objectives, Department-wide commitment should follow.

Further, incorporating the e-Diplomacy approach and corresponding KM principles into the Department's overarching strategic planning processes can serve to reinforce organization-wide commitment to knowledge sharing. The Department may choose to emulate other organizations in establishing a senior-level KM council or steering committee to govern these KM planning decisions. Such a council, with Office of e-Diplomacy support, could help in establishing more specific policy to guide Department units in carrying out KM activities. As new initiatives are introduced, the balance between central e-Diplomacy oversight and funding versus the individual units' responsibility for those initiatives will also have to be determined.

Addressing Cultural Barriers within the Department

Perhaps the greatest challenge facing the Department is overcoming the cultural barriers to sharing knowledge. To develop appropriate, counteractive strategies, e-

Diplomacy officials need first to assess the current environment. Several senior officials told OIG that the tendency in the Department traditionally has been to hoard and not share knowledge. Some said that the Department's culture is "too impossible and resistant to change." The Department's decentralized organization structure, two-to-three year FSO rotations, and the competitive "up-or-out" policy reinforce this mindset.

Although ensuring senior management's support is a major factor in promoting participation in KM activities in the Department, it may not be enough to change the culture. More can be done to ease the transition from a KM plan to actual implementation. Mandatory training, linking knowledge sharing to performance appraisals, and providing awards and recognition for excellence in communications and collaboration are all strategies for overcoming cultural resistance. Determining the appropriate blend of these strategies will be key. Any cultural change, however, will not occur overnight. Some friction and lingering resistance may accompany the ongoing change to a KM environment.

Building KM Communities within the Department

Although the Office of e-Diplomacy has made progress in identifying some ongoing KM communities, it could take steps to identify others that it is currently unaware of and determine their structures, functions, needs, and constraints. Such information would help the office determine how it can build upon or assist these efforts. The Office of e-Diplomacy might also recommend alternative approaches, such as creating web portals or improving coordination, to help the KM communities better meet their objectives. With e-Diplomacy support and direction, still other KM communities might be established, and new and creative ideas implemented, to meet identified knowledge sharing and collaboration needs.

Using IT in e-Diplomacy

After the FASI experience, the Department appreciates the potential value of IT in supporting, rather than driving, its KM program. The Office of e-Diplomacy was designed to ensure this business focus, while also providing the technology and tools needed to facilitate KM efforts. Maintaining this balance will be critical, especially given the recent decision to shift e-Diplomacy to the IRM umbrella, albeit via a new business process section within the IRM bureau. Specifically, in June 2003, the Under Secretary for Management decided to reorganize IRM to improve the Department's management of the range of e-government challenges, including business-based planning, IT security, and knowledge management, and

meet objectives of the *President's Management Agenda.* When the Office of e-Diplomacy was created, there was no consensus on where it would permanently reside. The plan now is to create a Business Practices and Programs Group to combine e-Diplomacy with IRM's current Office of Enterprise Architecture and Planning and its Office of Customer Service. A deputy chief information officer, who is also the chief knowledge officer, will head the new group.

Working together, the Office of e-Diplomacy and Department bureaus and offices will need to determine appropriate and cost-effective IT solutions for meeting business requirements for knowledge sharing. IRM's assistance will be essential to help integrate existing KM systems, meet security and e-government goals, and identify still other technology needs of the Department's KM communities. Providing for the effective maintenance and update of these KM systems, as well as the data they contain, is another strategy that must not be overlooked.

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SCOPE AND METHODOLOGY

To meet its review objectives, OIG identified guidance and relevant criteria for designing and implementing KM programs. OIG conducted Internet research to compile background information on the KM strategies of various organizations, their ongoing KM initiatives, and the effective practices and lessons learned from these initiatives. OIG also attended a conference sponsored by a leading consulting organization to obtain general information on key KM concepts and principles.

OIG then met with senior management within the Department to learn how its approach to centralizing KM began. Specifically, officials within the Office of the Under Secretary for Management told OIG about their review of ongoing IT programs, including FASI, and their efforts to coordinate such KM efforts through the new e-Diplomacy Office. Senior managers directly responsible for setting up the e-Diplomacy Office told OIG about the mission and activities of this organization.

OIG then visited organizations within the Department that had KM or similar initiatives in place before the Office of e-Diplomacy was established. Specifically, A/CAI officials told OIG about their plans to improve administrative services domestically and overseas through improved information exchange. Senior Management and Office of e-Diplomacy officials told OIG about a KM initiative to improve formal and informal messaging throughout the Department.

OIG met with representatives of the Office of the Under Secretary for Economic, Business, and Agricultural Affairs and the Office of the Under Secretary for Political Affairs to learn about the G8 project aimed at enhanced communications and policy coordination on global issues among the eight member nations.

Officials within the IRM Business Center provided additional information on the G8 project's status, oversight, and funding. An IRM Systems and Integration official shared with OIG their efforts to eliminate redundancy and support coordination among administrative systems through the Collaborative Application Technology Solutions forum.

OIG also met with representatives of various external organizations to discuss and obtain supporting documentation on their efforts to implement KM. Specifi-

cally, officials from the following federal departments and agencies told OIG about their KM strategies, systems, and initiatives:

- Department of Defense, Defense Information Systems Agency (DISA);

- Department of Transportation, Federal Aviation Administration;

- Department of Transportation, Federal Highway Administration (FHWA);

- Department of the Army;

- Department of the Navy;

- National Aeronautics and Space Administration (NASA);

- Office of Personnel Management;

- Pension Benefit Guaranty Corporation; and

- U.S. Agency for International Development.

OIG also reviewed General Accounting Office (GAO) reports and met with officials of the audit organization to discuss the results of its review of the Department's interagency collaboration efforts via the FASI program and to learn how it is applying KM to support internal audit work. The Mitre Corporation, a private, nonprofit organization, provided information on how knowledge sharing is ingrained in its culture, enabling it to concentrate on developing IT tools to support KM. In many instances, officials from these organizations demonstrated their knowledge sharing databases and web portals and provided OIG with books, papers, or electronic media to assist with OIG's KM study. Selected publications that OIG found useful to its study are listed in Appendix C.

Officials from academia discussed with OIG their role in helping to promote knowledge sharing by studying and documenting the cultural behaviors and KM activities of effective organizations. For example, OIG met with a George Mason University professor to share perspectives on what is necessary to implement a successful KM project. A consultant from the University Group and another from George Washington University, tasked by the Under Secretary for Management to define KM and identify the Department's need for it, told OIG about the significance of KM to an organization's business and the importance of understanding cultural influences when creating a KM project.

For international organization perspectives, OIG met with a World Bank official who discussed the pivotal role of senior executives in providing financial, policy, and organization-wide support to ensure KM success. Officials from the Inter-American Development Bank (IDB) told OIG about their bottom-up approach to coordinated management of KM activities. Further, OIG visited the

following U.N. organizations to discuss how they are implementing KM to support their disparate missions:

• United Nations International Children's Emergency Fund (UNICEF);

• United Nations Development Program (UNDP);

• United Nations Development Fund for Women; and

• United Nations Population Fund.

OIG shared with officials at the U.S. Mission to the United Nations the effective practices and lessons learned from its examination of the KM activities underway throughout the United Nations. In turn, these officials shared with OIG their efforts to improve archiving, retrieval, and sharing of voluminous historical data on United Nations activities and decisions, as well as restructuring and coordination to enhance the mission's internal operations.

OIG conducted its review from June to December 2002 at the Department's headquarters and other federal, industry, international, and academic organizations in Washington, D.C., and at the United Nations in New York. OIG would like to thank the officials from these organizations whose advice and assistance throughout this project have been invaluable. OIG coordinated the KM study with its prior review of the Department's management of the FASI program to support interagency communications and collaboration. OIG obtained comments on a draft of this report from the Office of e-Diplomacy. Based on the comments and as appropriate, OIG made minor revisions throughout the report to ensure that the information presented is accurate and up-to-date. A copy of the comments is included at appendix D. Major contributors to this report were Frank Deffer, Sondra McCauley, Cassandra Moore, and Pamela Young. Comments and questions about the report can be directed to Ms. McCauley, audit manager, at mccauleys@state.gov or (703) 284-2770.

SUCCESSFUL KM PRINCIPLES AND PRACTICES

Principle I: Recognizing the Benefits of KM to the Organization

KM has the potential to transform day-to-day business operations and yield faster and better information and services. However, to formulate an effective strategy for improved knowledge capturing and exchange, an organization should first pinpoint what it seeks to accomplish through KM. Identifying fundamental business requirements serves as a basis for determining which of the many possible KM approaches (e.g., web-based sharing, networking, or community building) is appropriate for an organization. Measuring outcomes from KM implementation will help ensure that the organization is reaping the benefits of KM and convince senior managers of its usefulness.

Understanding the KM Concept

As with any promising discipline, organizations offer different definitions and perspectives on KM, but fundamentally KM means leveraging the knowledge that already exists in an organization to strengthen its functions, often to gain a competitive edge. KM is not primarily about technology: it is about people. It is also not just about information: it is about what people perceive, discover, or learn. It has at its core the concept that the most valuable assets in an organization are the experience and expertise of its people. It may be positive knowledge—effective practices and valuable information—or it may be lessons learned about what not to do in the future. The knowledge may be resident not only with an organization's employees, but also with its customers, partners, and other key stakeholders. The challenge of KM is unlocking this knowledge and promoting its transfer and reuse to the benefit of the whole organization. Creating an environment where people who have the knowledge are comfortable about sharing it is just as key.

Recognizing the Benefits of KM

Organizations OIG studied have found that the true value of KM is the improved teamwork and enhanced skills derived from employees' interaction, and not just the content or information that results from networking and sharing. For

example, knowledge sharing among employees can help spur creativity, individual competencies and skills, and overall workforce morale. It can bridge the gaps created by organizational dispersion, allowing employees in one business location to identify and tap into information and expertise in another location and thereby avoid duplication. The trusted group that emerges can give employees a strong sense of professional identity and instill confidence in discussions where they present new ideas.

Where an organization promotes collaboration, it has greater potential to attract and retain talented employees who might leave if they could not introduce improvements to their work processes. KM can also safeguard against potential losses when employees do leave an organization and take their wisdom and experience with them. Capturing or transferring their know-how before they depart can reduce learning curves and ease the transitions for other employees assigned to fill the vacancies they leave behind.

Effective organizations recognize that there are many economic and management benefits to KM as well. They know that adopting KM as a management tool helps them to accomplish mission goals, increase productivity, and reduce waste. For example, they use KM to minimize risk and uncertainty by giving managers direct access to the knowledge needed for effective decision-making. They find that it helps reduce operating costs by integrating business processes across such organizational elements as marketing, sales, and warehousing. Such cross-organizational sharing also has an equalizing effect of bringing poorer performing units up to the level of better units. This, in turn, can produce more effective and streamlined operations, helping to transform the manner in which departments, divisions, and indeed entire organizations do business. The end result may be better products or services from an organization to its customers.

As such, effective organizations perceive leveraging knowledge as an imperative rather than an option, allowing them to flourish and keep pace with competitors in the current business environment. Where organizations gain a leading edge through KM, it becomes harder for competitors to overtake them. To maintain that lead, organizations retain KM as a constant, never-ending discipline.

Identifying Critical Business Needs as a Basis for KM

An organization's KM strategy should be rooted in its fundamental business needs and objectives, for it has to know how managing knowledge will enhance its mission. Where KM efforts are linked to real business needs, they have the poten-

tial to be successful. Where they are not, an organization can end up with an expensive collaboration system or process that has no real value or purpose.

To link KM to business needs, organizations must first have a good understanding of their fundamental missions and operations and the security needed to protect them. With this understanding, organizations can best pinpoint where and how to focus their KM efforts for the greatest results. According to industry experts, KM is best applied where an agency is hurting most; that is, where it is not performing as well as it might and needs to rethink how best to work toward its mission. In addition, organizations can focus KM efforts on areas with high costs, the greatest revenue potential, and the biggest competitive threats. Another good time to consider using KM is when an organization notices redundant or inefficient processes, which cause the employees to spend too much time searching for information instead of being productive.

Many organizations link KM implementation with events, such as layoffs, retirements, and mergers; however, an organization should not wait for such major shake-ups to surface before beginning KM. Whatever the organization ultimately decides in terms of when or where to apply KM, officials should remember that the business environment—internal and external—will continue to change. As such, KM strategies must also change to meet those evolving needs.

Appreciating Different Approaches to Applying KM

Organizations used a range of KM approaches to address identified business needs. For example, some relied strictly upon people-based initiatives, such as community building, workshops, and networking, to encourage collaboration. Others focused on computer-based strategies, such as web portals, collaborative tools and applications, or e-mail servers, to support the transfer of knowledge. More often than not, organizations used a combination of the two. Recognizing that there was no one way, or right way, to implement KM, they all chose strategically and carefully to adopt the strategies and projects best suited to their organizational needs.

Managing and Measuring KM Results

Effective organizations recognize that performance monitoring is a vital and important step to ensuring KM success. Measures can help determine the degree to which organizations are reaping the benefits of KM. They can ensure that the knowledge sharing strategies implemented are effective and on track. If an organization does not measure its KM activities and results, it will have a hard time

understanding what is working and what is not. Measures can also help determine the need for and the design of future KM systems and initiatives. Ultimately, they can provide the data needed to communicate with senior managers and stakeholders on the KM progress made.

   OIG found that organizations generally struggled with identifying and adopting the appropriate measures to assess the value of KM. They were able to put some sort of indicators in place to help demonstrate progress and performance. The measures they used differed throughout the KM project life cycle. At the beginning of an initiative, when not a lot is known about the KM project, organizations focused on inputs or contributions, such as vested dollars, or staff time. Subsequently, they measured KM activities, such as employee participation in KM communities or the types of information asked for and received from newly established KM help desks. A number of organizations counted the web page "hits" to their KM Intranet and Internet sites.

   As a KM initiative progressed, the focus of measurement moved toward outputs and results. At this point, what the organization measured generally depended on the goal that KM was helping to achieve, not the KM effort itself. For example, UNDP consolidated its results-oriented reports into a large database that summarized accomplishments, shortfalls, and the differences made by KM. (See the following case study.) Further, a university professor suggested surveying participants in areas where KM had proven successful to discuss the knowledge sharing changes made, pinpoint barriers to success, and determine the degree to which KM had become ingrained in the culture. Organizations must be prepared to accept some degree of uncertainty in relying upon such subjective measures to evaluate the impact of KM.

Principle I: Recognizing the Benefits of KM to the Organization

Case Study on the United Nations Development Program

KM is a key part of UNDP's strategy for helping countries build and share solutions to development challenges. Working through its offices in 135 developing countries, UNDP's operations are based on dispersed capabilities and decentralized networks. UNDP's Bureau for Development Policy takes a matrixed, regionalized approach to supporting the country offices, providing policy advice to its national counterparts through a network of nine Subregional Resource Facilities (SURFs). UNDP also links its staff through a series of networks to share knowledge and experience on specific thematic topics.

UNDP's KM program began about four years ago through the efforts of a staff member who had returned to New York after assignment to several country offices. Knowing firsthand that specialist support from headquarters to the country offices was inadequate and not well coordinated, this official sought ways to address the problem. In 1999, with the responsibility for reorganizing the Policy Bureau, this official introduced the SURF concept, whereby specialists provide country offices with demand-driven policy services. Recognizing that the bureau's 100 doctorate-level experts had tended to hoard rather than share knowledge, only 20 were retained after the reorganization. The bureau subsequently recruited 80 additional specialists through internal and external means.

In a parallel attempt to improve headquarters support to the country offices, the same staff member asked eight country officers to e-mail to a consultant several questions to which they needed answers. Instead of waiting for the consultant to respond, the country officers began answering each other's questions, realizing for the first time how much they individually knew and how they could help one another. Recognizing the effectiveness of such networking and the potential benefit it held for all UNDP, the staff member presented the idea to senior management, who agreed to formally institute the knowledge networking approach. By January 2003, there were 3,000 subscribers to the e-mail discussion groups, which UNDP officials told us are perhaps the most developed of all the U.N. organizations.

The substantive support that UNDP provides to its country offices has greatly improved as a result of these KM activities. Unlike before, country officers now determine what support they need, and SURF specialists respond accordingly. Through the networks, the country officers also identify expertise and knowledge resources to help each other. UNDP measures the success of its KM approach by monitoring country officer satisfaction with the global knowl-edge networks. For example, in 2002, an independent survey found that overall country officer satisfaction with both the SURFs and networks rated 3.9 out of 5, up from 3.7 the previous year. UNDP also links KM to mission improvements in its annual reports on country accomplishments and strategic results.

PRINCIPLE II: ENSURING ORGANIZATION-WIDE SUPPORT FOR KM

Senior managers provide the impetus for KM success, but although they have the resources and authority needed to support KM implementation, they cannot do it alone. They need to designate an individual or office with responsibility for fostering and overseeing KM day-to-day. This advocate can serve to document the organization's KM approach, linking it to the strategic business plans and directions. From a central vantage point, and with staff support, this advocate also has responsibility for networking among employee groups and coordinating KM activities organization-wide.

Securing Executive-level Support and Sponsorship

Senior management support is a major contributor to the success of an organization's KM program. Where senior officials understand and appreciate the benefits of KM, they can champion its incorporation into an organization's vision and strategic plan. Senior officials are well positioned to communicate the KM vision to all levels of the organization, outlining strategies and techniques for its practical application. They also have the authority, influence, and resources needed to implement and sustain the programs. To demonstrate the commitment to KM and build trust across the organization, senior managers have the foremost responsibility for embracing KM behavior by using KM terminology, providing support for KM initiatives, and participating in KM activities. They also can promote a KM culture by offering rewards and incentives to employees for adopting effective knowledge sharing and collaborative behaviors.

Officials at several organizations discussed with OIG how executive-level sponsorship was critical to the success of their KM efforts. For example, the Secretary of the Army issued a written mandate that all employees and systems be linked to Army Knowledge On-line, the military service's Internet-based knowledge sharing and collaboration system. As a result, the system is widely used to provide a range of information and services, such as travel schedules, pay scales, voucher applications, and medical appointments scheduling. Conversely, when officials at UNICEF tried to implement KM without the support of senior leadership, the project never met with acceptance across the organization. These officials learned the hard way that without top-down commitment and clear business drivers, a KM effort is likely to fail.

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Designating a Focal Point for KM

Effective KM requires coordination by senior individuals, centrally positioned and able to influence those empowered to fund and effect organizationwide KM decisions. These KM officials must also be familiar with the organization's culture and business needs and able to network and promote KM communities among employee groups. Too often, however, KM projects are initiated and managed by IT professionals, who may be knowledgeable about hardware, applications, and communications networks for KM, but are not familiar with the organization's business needs. They are therefore more likely to develop KM solutions that are biased toward technology, but not necessarily designed to meet employee needs.

Designated KM focal points at the organizations that OIG visited varied widely in terms of their positions and authority. The following are just a few examples of the types of KM officials identified.

- The chief knowledge officer in FHWA's Corporate Management Office reports to the associate administrator, who oversees program reviews, quality assurance, and performance planning in addition to KM. The chief knowledge officer is directly responsible for coordinating implementation of KM organization-wide.

- The knowledge services officer within GAO's Chief Mission Support Office reports to the organization's chief financial officer. The knowledge services officer is exclusively responsible for managing KM-related operations, including a shared service center, central printing support, information services, records management, web content, publications, and graphics.

- UNDP's policy support coordinator reports to the deputy assistant administrator and director, Bureau for Development Policy, and is supported by a network coordinator, who also works to increase knowledge sharing across the organization's many different employee groups.

- The World Bank's KM sharing coordinator reports directly to the Bank's vice president and is responsible for centrally managing the organization's many KM communities.

- Contractors within NASA's Academy of Program and Project Leadership are responsible for coordinating KM through project manager training and career development activities at NASA's ten centers nationwide.

At times, these KM focal points were members or chairs of executive councils responsible for making KM decisions and promoting its implementation across their organizations. For example, DISA's KM council is comprised of mid- to senior-

level representatives responsible for reviewing and approving all KM initiatives within the organization. One of the council's foremost goals is to eliminate redundancies and prevent inappropriate KM initiatives from being implemented. The chief knowledge manager, who chairs the council, has also developed an agencywide policy on KM and provides employee training on knowledge sharing and collaboration concepts upon request. Such KM advocates have foremost responsibility for networking with their counterparts in external organizations and forums, such as the Federal Chief Information Officer Council's KM Working Group or academic roundtable discussions, to elicit effective KM practices and lessons learned.

Providing Funding and Staff Resources

Ideally, the central KM advocates or offices ideally should be supported with adequate funding and staff to carry out their responsibilities. OIG found that few organizations were able to accomplish successful KM initiatives without dedicated resources. Without a full appreciation for KM or its benefits, senior managers often were initially reluctant to allocate limited corporate resources for what they considered a relatively new concept and potentially risky proposition. Central advocates or organizations therefore used creative funding strategies to further KM initiatives, or they encouraged participating units to contribute voluntarily from their operations budgets. Only after these KM initiatives demonstrated success were officials able to gain the budgets and staff they needed to institutionalize their efforts. Fortunately, this trend is changing. Senior officials increasingly appreciate the potential benefits of KM and champion its implementation without first having to be convinced. More and more, they understand that KM is not merely a passing discipline, but is rooted in sound business management principles that warrant priority funding and ongoing attention.

Documenting KM Directions

Although the importance of defining a KM strategy is often overlooked, successful organizations recognize that KM should not be introduced ad hoc. Rather, they outline their strategies for applying KM to meet their business needs and broadly disseminate this information to their employees, often in the context of organizationwide strategic or business planning.

For example, officials at the United Nations Development Fund for Women brought together KM communities from across the organization to develop a strong strategic design that included business requirements planning. GAO officials also

considered the various aspects of information sharing and their interrelationships in planning their strategic direction. These aspects included information resource management (technology, applications, data, and content), information management (records and documents), and KM (social capital, human capital, and information services). GAO's combined KM and strategic approaches were intended to strengthen business relationships and acquire web-based tools for knowledge sharing.

Organizations often issued specific policies to ensure the adoption of KM strategies. For example, as discussed above, the Army mandated KM implementation across the organization. Other organizations provided guidance on carrying out various aspects of a KM program, such as managing content on a collaborative web portal. A DISA official was drafting guidelines and defining KM's relation to the agency's mission. Through this strategic approach and demonstrated successes, the official was able to secure increases in KM budgets and gain employee support for knowledge sharing initiatives. In contrast, Navy officials were reluctant to issue KM policy, stating that the concept did not readily fit with its military culture. Navy focused instead on coordinating KM teams, educating employees on KM principles, and providing a forum for discussing KM ideas and frustrations.

Principle II: Ensuring Organization-wide Support for KM

Case Study on the World Bank

The World Bank is highly acclaimed by academic and industry benchmarking organizations for its effectiveness in applying KM principles and practices. The Bank's first KM system initiative in 1996 did not adequately identify business requirements or establish an effective relationship with system users. Finding that the IT system provided little benefit to mission performance, users barely used the system. A World Bank official who worked on the initiative reflected that the key lesson from this failed system effort was "build it and they won't come." The initiative nonetheless provided a basic understanding of how the Bank could advance in KM through the use of "thematic groups," also known as KM communities. With the support of the Bank's president and commitment by the Board of Directors, a KM strategy was incorporated into the Bank's vision.

The World Bank undertook a second initiative to institute a KM system the following year. The strategy was to identify problem and high profile areas that presented opportunities for applying knowledge sharing principles to better accomplish the Bank's international develop-ment goals. As part of this effort, KM officials identified, documented, and studied over 100 ongoing KM communities, one of which had existed for about 20 years, and worked to better coordinate them. Where appropriate, KM officials also encouraged the formation of new KM communities comprised of subject area specialists that had similar interests and could benefit from sharing their expertise. KM officials coordinated with IT and business representatives on using the Intranet to bring together the information and applications used by the Bank's various regional subgroups.   A rewards system was instituted to help promote these initiatives and overcome cultural resistance to sharing across subdivisions. Beginning in 1998, the Bank provided $60 million in annual funding for KM, owing in part to the demonstrated success of the KM initiatives implemented the previous two years.

Because KM is now ingrained in the World Bank's culture, less funding and fewer staff resources are now needed to coordinate KM activities. Specifically, at one time, the KM staff consisted of approximately 70 people. However, given concerted efforts to mainstream KM and shift responsibility for continued knowledge sharing to program units, currently only three officials—a KM sharing coordinator and two staff—are assigned to oversee KM activities organization-wide. A consultant who worked on a team of seven staff under the direction of the KM program director has served as a major proponent for KM within the Bank. In 1996-99, the consultant worked closely with the Bank's Chief Information Officer to identify the tools and technologies needed to effectively support KM. Key IT components of the Bank's KM effort include use of the Internet and Intranet and an online directory system.   People-centered activities to knowledge sharing include continued use of thematic groups, advisory services, brown bag luncheons, seminars, and videoconferences. The Bank holds more than 100 videoconferences for knowledge exchange each day.

PRINCIPLE III: APPRECIATING CULTURAL BARRIERS TO KM SUCCESS

Perhaps the greatest challenge to effective KM is ensuring a culture that encourages sharing knowledge and building trusted business relationships. Overcoming cultural resistance to KM requires focusing on employee needs, interactions, and specific strategies to motivate them to change behavior. Although numerous organizations offered incentives and awards for knowledge sharing, they generally agreed that demonstrating success with small, initial KM projects is an effective means of gaining organization-wide commitment as well.

Understanding Cultural Hindrances to KM

Effective KM requires a supportive cultural environment. An organization's culture is a combination of shared history, expectations, unwritten rules, and traditions that affect employee behaviors. KM officials should have a good understanding of their organizations' cultures and employee attitudes toward teamwork and sharing. Where organizations already value knowledge sharing, successful KM may only require facilitators and technological support. Too often, however, organizational cultures are counter to KM principles. Officials at a number of organizations said that their employees generally resisted adopting new technologies and collaborative behaviors in the workplace. Employees were reluctant to trust each other and saw more value in keeping knowledge to themselves than sharing it with competitors. Where information was shared, it generally occurred among small groups of peers who already had collaborative relationships. Officials in still other organizations stated that although their employees did not hoard information or resist sharing it, their workloads did not allow time to participate in KM activities.

Overcoming Cultural Barriers

Changing an organization's culture to foster sharing and trust may be the most difficult aspect of instituting KM. Employees often need to feel safe and see the benefits to sharing before they embrace KM principles and behaviors. Overcoming cultural resistance requires a people-focused approach—examining employee needs, studying typical interaction and environmental factors, and determining the incentives needed to encourage change. Simply providing employees with collaborative tools and technologies may not be enough to compel them to share with people they do not know.   Knowing this, effective organizations are instituting

pointed strategies for addressing cultural barriers to knowledge sharing, concurrent with implementing KM initiatives. They recognize that without such countermeasures, any KM initiatives they introduce are at possible risk of failure.

Promoting Awareness and Training

Conferences, workshops, and publications are a means of promoting awareness, increasing commitment, and overcoming cultural barriers to sharing and collaboration. For example, IDB's knowledge sharing committee invites guest speakers every two to three months to discuss ways to improve the Bank's KM activities. (See the case study.) Navy KM officials told OIG that they focus on educating employees about knowledge sharing principles in the context of "tiger teams" to support KM activities and meetings where employees can express their thoughts and frustrations and propose KM solutions. Further, NASA routinely invites guests to speak to employees on KM concepts and issues. NASA has also created several forums for project managers from across the agency to share their management success stories. NASA publishes many of the stories in bi-monthly editions of its Academy Sharing Knowledge magazine. Similarly, the Pension Benefits Guaranty Corporation plans to post on its web site a booklet of employee lessons learned in managing the pension plans of defunct companies.

Training is another good way to promote the benefits of KM. For example, NASA's incorporation of KM in its leadership development curriculum has significantly increased agencywide communications and collaboration. The Navy uses a collaborative portal to administer its "Task Force Excel" program, which provides online leadership and technical training to sailors to support their military careers. Task Force Excel is part of a Navy pilot in the submarine community, which has the dual purpose of demonstrating a KM success and providing real-time, relevant sailor training on effective ways to manage the turnover in boat crews every 80 days. Further, GAO is seeking to combine KM with training to support the transfer of institutional knowledge and expertise to new and junior staff as senior, experienced staff retire or leave the agency. Such training should also help in managing attrition among the current generation of staff who increasingly do not view themselves as career federal employees.

Providing "Push" Technology

Placing routine services and information online and forcing employees to use collaborative systems is another way of promoting KM. As previously discussed, in line with mandating 100 percent participation by employees in KM activities, the Army uses such "push technology" on its Army Knowledge On-line portal. All

civilian employees, soldiers, and their families are given accounts to access the system. They have no alternative means to access services and information regarding voucher payments, medical appointments, salaries, and clearances. Army employees must also use the portal to retrieve e-mail. Some officials have suggested that limiting the capacity for employees to attach documents to e-mail messages would be another effective way to encourage the use of collaborative systems for file sharing and data exchange instead. Using collaborative systems, such as web portals, for document sharing also may provide wider accessibility, improved version control, and increased potential for archiving and retrieval.

Offering Incentives and Awards

Officials from a number of organizations stated that incentives might be needed to motivate employees to adopt knowledge sharing behaviors. For example, some organizations include collaboration and knowledge sharing in their employee job descriptions and performance appraisals. A few organizations rate supervisors on the extent to which their subordinates participate in KM activities and make KM a criterion for management-level promotions. The U.S. Agency for International Development incorporates 360-degree feedback from employees in evaluations of supervisors' performance in teamwork and collaboration. In recognition of competing workloads and business demands, a few organizations support this new KM job dimension by allowing staff to periodically devote time to knowledge sharing activities.

Further, organizations provided a variety of rewards and acknowledgments for knowledge sharing activities. For example, one private organization gives employees cash awards for posting frequently referenced research papers to its web site. DISA held a contest to name its KM portal and help draw attention to the site. The winner was awarded a special prize and was featured in the agency's monthly newsletter. KM officials at the Federal Aviation Administration reward employees by sending them to KM training. The officials expect that employees will in turn want to share what they learn with others. The Army awards employees that help to discover new KM efforts across the department. The project management success stories that NASA publishes in its Academy Sharing Knowledge magazine give managers the satisfaction of seeing their names in print, as well as recognition from their peers for their accomplishments. The FHWA also publicly recognizes its employees with kudos, memos, and plaques for exceptional KM accomplishments.

Incrementally Implementing KM Initiatives

Although their strategies varied, officials that OIG interviewed generally agreed on the need to institute KM incrementally in an organization rather than trying to do it all at once. They found that starting with small KM initiatives that can be accomplished quickly, touting their outcomes and benefits, and then building on their successes is an effective means of overcoming cultural resistance to knowledge sharing. Recognizing that KM implementation is not necessarily easy, they also typically began in areas where major, cultural changes would not be required to achieve results. As one official concluded, KM in action makes it easier to sell the concept across the organization rather than try to institute wholesale business change. For example, after the tremendous success of its initiative to institute a collaborative portal and promote knowledge exchange among rumble strip experts, FHWA was inundated with requests to identify expertise, form KM communities, and reengineer business processes in other areas.

Officials that OIG interviewed anticipated that institutionalizing KM might take awhile. However, they did not necessarily believe that KM must remain a separate program forever. They expected that, over time, new collaborative behaviors would become part of an organization's culture to the point where minimal, if any, oversight would be needed for KM to continue. For example, Navy KM officials said that they facilitate and coordinate many disparate and largely autonomous KM efforts, but do not try to impose too much oversight. These officials expect to institutionalize KM so that eventually their office will no longer be necessary. Although the Navy had no set time frame for accomplishing this objective, some organizations suggested that KM may need at least five years to become ingrained as a routine way of conducting business.

Principle III: Appreciating the Cultural Factor in KM

Case Study on the Inter-American Development Bank

Encouraging knowledge sharing across business departments was a big challenge for IDB officials. Although a lot of KM-like activity was already happening at the Bank's headquarters, most of the sharing was among employees in the same departments, who did not see benefits to networking with unrelated departments.

Staff interested in KM began a campaign to promote among managers and employees the benefits of cross-organizational knowledge sharing. A new council, the Knowledge Exchange Network Steering (KENSTEER) Committee, was established to encourage informal collaboration on KM organization-wide. The committee began to study how knowledge was exchanged and managed at the Bank. Committee members identified 23 unofficial KM communities that met routinely to share information across departments and sometimes with members outside the IDB. Most communities had coordinators and included a range of representatives from the various departments. However, identifying the KM communities was not enough; a greater task was to find a way to strengthen KM activities and programs at the Bank and get management support.

The KENSTEER Committee's strategy for overcoming cultural resistance to sharing centered on hosting a Knowledge Exchange Fair, modeled after similar events held at the World Bank and other federal agencies. The fair was the most successful initiative that the committee undertook, drawing vast participation from across Bank departments. Although the Bank did not offer any awards or incentives to motivate employees, the fair alone helped generate acceptance of KM and recognition of its benefits. It created pride among employees in the different departments, as evidenced by the displays and brochures they created, which helped them learn about each other and the range of Bank functions. The fair encouraged employees to join KM communities and stimulated interest in previously underused resources, such as the Bank's legal library. The bank's president and vice president were in attendance, helping to emphasize the importance of the event. Although most of the Bank's KM activities were at headquarters, one country office representative assumed the cost of travel to Washington, DC, to participate in the KM fair and take ideas back to the field. One department has gone on to host its own virtual fair, sharing knowledge online, while others have included information related to the fair on their Intranet sites.

Additionally, the Bank has created an enterprise portal to link about 152 web sites across the organization. The portal gives everyone, including country offices, access to commonly needed information. The portal team has held brown bag luncheons to train employees on use of the portal and collaboration tools. The KENSTEER Committee's latest effort has been to launch a survey to assess the needs of Bank communities. Survey results show that many staff are interested in joining KM communities. Also, most KM community members who responded to the survey indicated that management support is crucial for their communities to progress and become more efficient. Despite these KM successes, Bank officials continue to confront cultural issues, including the preference by most KM communities to remain unofficial.

PRINCIPLE IV: BUILDING KM COMMUNITIES

Promoting unity, trust, and an environment where employee groups with similar interests can interact to share knowledge and expertise is a fundamental part of effective KM. Rather than initially creating new KM communities, organizations that OIG studied identified existing networks and sought ways to facilitate and further their efforts. These organizations also advocated the introduction of innovative techniques for marketing knowledge sharing strategies and activities and encouraging wider participation and the formation of new KM communities to address emerging needs.

Defining and Identifying KM Communities

Though the term is relatively new, KM communities have a long history. They emerge at work, school, home, and church, whenever groups of people come together because of a shared interest or goal. Some have names, and some do not. They cover a range of sizes and structures and are not necessarily bound by organizational associations. They may be formal organizations or freely structured, ad hoc groups that convene in a number of ways and for a variety of purposes.

For example, small close-knit groups of specialists may meet to share their experiences, knowledge, or effective practices in a given subject area. On a larger scale, businesses may host structured conferences, workshops, or roundtable discussion groups. Informal KM communities emerge as loosely structured networks of employees come together in discussion groups, such as weekly brown bag luncheons. Community members are not limited to face-to-face interaction, however. An array of collaborative tools and technologies is available in today's market to support their interaction.

KM communities are generally characterized by a great deal of trust and a willingness among members to help one another. They exist because their members value the group interaction and are defined by the members' knowledge and common understanding rather than by explicit tasks. For example, a member might share experiences on a high-profile project and discuss the problems encountered. In turn, other community members might offer insights and suggestions without actually getting involved in the project in question. The member presenting the project or concern for discussion could listen to the advice without feeling pressured to take it.

Such exchanges are a practical way of leveraging the combined know-how of employees to achieve the many mission and employee benefits discussed in prin-

ciple I. Although its full potential may not be apparent when it is first formed, that value can be realized as the KM community evolves over time.

Supporting KM Communities

At the start of a KM program, organizations often identified the communities already in existence to determine how they might be leveraged to formulate an overarching KM strategy. They found that many communities have emerged naturally over time, organizing their activities and structures on their own. In some instances, the communities were found to function best without support or intervention by their parent organizations. As experts suggest, some communities might wither away, rather than flourish, under the spotlight. At other times, organizations effectively built upon the communities already in existence—developing web sites to support them, linking them to other related communities, or broadening their scope to enhance other parts of the organization.

For example, at the start of its KM program, World Bank officials identified a number of communities that had been operating for more than 20 years and worked closely with them to meet their needs. With central support and coordination, the number of KM communities at the Bank grew from ten to well over 100. Similarly, on beginning a KM program, the IDB discovered it had more than 20 ongoing KM communities. The Bank integrated more than 150 individual Intranet sites that supported these communities into a single web portal.

Sometimes, organizations faced the challenge of forming completely new communities to meet identified KM needs. They realized that although these communities might not require much direct management involvement, they could nonetheless use some leadership to get started and keep functioning. Organizations understood the need to create safe, trusted environments where people would voluntarily come together to try to understand each other. They recognized their responsibility for providing central oversight to coordinate the KM communities and prevent duplication. Although they found that administrative costs and overhead might be minimal, they also knew that the members would need time, space, and tools to collaborate effectively. The foremost challenge for organizations was maintaining the tenuous balance of helping the communities identify the necessary resources and make the right connections without overwhelming them.

More often than not, organizations used facilitators to support community-building. Facilitators are responsible for engaging existing community members and providing the leadership needed to recruit others. Their main role is organizing and encouraging the knowledge exchange processes and activities within the communities. Rather than seek to take control, impose their views, or dictate to community

members, facilitators work to enhance their KM communities. In some organizations, the facilitators emerged naturally from enthusiastic community members interested in furthering KM activities. Sometimes, they were recognized experts from inside or outside of their organizations appointed by management to promote exchange on strategically important topics. In other instances, the facilitators were technical personnel who acted as caretakers for collaborative portals, databases, or servers.

Fostering Innovative Community Activities

Successful KM organizations continually pursued new and creative ways to advertise KM strategies, capture knowledge, and heighten the sense of community within their organizations. For example, rather than use technical jargon, they adopted more engaging terminology, such as "warrior knowledge" at Navy or "knowledge exchange" at IDB, to communicate KM concepts and techniques. On an ad hoc basis, organizations have set up displays and distributed memorabilia (e.g., pens or cups with KM logos) or literature to stimulate interest in KM activities. As discussed above, the World Bank and IDB launched KM fairs to foster information sharing across their organization. Several organizations have built Intranet-based "yellow page" directories with employee pictures and profiles to assist in pinpointing expertise and needed competencies. Some organizations focus on fostering employee exchanges in the context of natural activities such as luncheons, happy hours, or midday breaks.

A well-known KM technique is the use of "storytelling" to capture the unspoken knowledge and business know-how. Storytelling builds upon the age-old practice of orally communicating values, traditions, history, and cultural experiences from generation to generation and has become an accepted technique among KM organizations. In auditorium-like settings, KM storytellers share anecdotes about their business experiences and lessons learned. They sometimes engage their audiences in question-and-answer sessions or role-playing to further the learning process. For example, the World Bank and DISA make extensive use of storytelling as a way of sharing knowledge and developing a sense of community within their organizations.

The most effective storytelling takes place face-to-face. However, this has the disadvantage in that the information may only be shared before a live audience at a given point in time. To address this issue, some organizations, such as the Federal Chief Information Officer Council's KM Working Group, capture the storytelling sessions on video or audiotape. The stories are often printed in books and magazines as well because it may not be easy for people to access the taped narrations.

Principle IV: Building KM Communities

Case Study on the National Aeronautics and Space Administration

One aspect of NASA's approach to instituting KM began about three years ago within the Academy of Program and Project Leadership. The Academy provides project managers at NASA's 10 centers with career development, knowledge sharing, and performance enhancement services and tools. The Academy created a Knowledge Sharing Initiative to instill a sense of community and convince project managers of the potential value of sharing knowledge and expertise across their organizational boundaries.

The Academy's director believes that knowledge is to be shared by practitioners in communities for the good of the enterprise. Academy officials use a grassroots approach to market the KM concept by going to each NASA Center to meet with the project managers directly. The Academy relies on three principal methods to support knowledge sharing. First, it sponsors a Forum of Master Project Managers twice a year. Although creative thinkers from external businesses and agencies bring enthusiasm to the Forum by telling stories about their work experiences, the Forums where NASA's own project managers share best practices and transfer lessons learned from their prior assignments are the most rewarding. Past participants of the Forum have said that the storytelling presentations and follow-on discussions make this an invaluable experience. All Forum speakers are invited based on peer referral, which is the cornerstone of the Academy's KM success.

Second, the Academy hosts Transfer Wisdom Workshops to foster the exchange of experience, know-how, and lessons learned from senior to emerging project managers. The Transfer Wisdom Workshops are one-day events, held at individual Centers, part of the Academy's strategy for encouraging the development of each Center as a knowledge sharing community. The workshops focus on small-group discussions of senior project management experiences and case studies.

Academy officials believe that, beyond schedules and lists of "do's and don'ts," project management decision-making includes many complexities and lessons learned that only stories can sufficiently and engagingly convey. They state that the career of every veteran project manager is full of short anecdotes and ongoing sagas from which everyone at the NASA community can benefit. Building on this hidden wisdom, the Academy therefore uses a third method, its Academy Sharing Knowledge magazine, to document and disseminate stories about the successes and failures of NASA projects. The magazine provides interviews with project managers, book reviews, and a column on effective practices. It is an on-line and print publication, mailed to more than 5,000 recipients, including about 500 outside NASA. Academy officials said that the magazine has elicited good feedback from practitioners who contact the magazine to learn more about the project management approaches detailed in the articles.

PRINCIPLE V: USING INFORMATION TECHNOLOGY IN KM

Technology can play a major role in supporting KM to help improve business operations. Choosing the appropriate IT solution based on business needs, however, is critical. Perhaps just as important is providing for the maintenance of the technologies chosen and the data they contain to ensure that they remain useful and up-to-date for collaborative purposes.

Understanding the Role of IT

Effective organizations recognize the role of technology in enhancing their knowledge sharing ability. They find IT invaluable in linking people across time and space, providing information and services rapidly and inexpensively, and capturing and documenting both tacit and explicit knowledge. To ensure KM success, however, they also understand the limits of technology when adopting IT solutions. They know that implementing technology to support KM does not, in itself, guarantee that knowledge sharing will occur. Although technology makes the connections and collaboration possible, it does not drive the cultural change.

Effective organizations also recognize that IT is not the most important component of KM. Rather, they understand that people and behavioral factors are key to information sharing. The efficiencies made possible by technology, however great, are no substitute for the trust and candidness that face-to-face communication can produce. As such, the most successful KM initiatives include both technology and interpersonal exchange. Neither replaces the other; however, one can greatly enhance the other.

Choosing the Appropriate Technology

For years, organizations have acquired collaborative technologies to create and sustain effective business operations, store and manipulate data, and exchange knowledge. However, technology for technology's sake should not be the objective. As discussed in principle I of this report, effective organizations identify their business requirements as a basis for KM. They emphasize that appropriate and cost-efficient technology solutions and corresponding security safeguards should map directly to those identified KM needs.

Too often, however, organizations have focused on tools and technologies rather than on fundamental business requirements for KM. Officials responsible for building their KM systems often were IT professionals who emphasized system

functionality rather than user needs. Such technical leadership made it difficult to create KM initiatives that addressed fundamental business problems and user requirements. The World Bank's initial unsuccessful approach to KM, discussed in principle II above, illustrates this point. The approach failed, in part because business requirements were not addressed in the system design. UNICEF's "Knowledge Network" was another unsuccessful KM initiative. UNICEF officials told OIG that the system was an idea before its time. It was independently conceived by a couple of individuals, funded by external donors, and outsourced for development without taking into account business processes and requirements. As a result, the system had a low level of usage and was never fully adopted within the organization.

Determining the most appropriate technology tools to meet identified business requirements has been a challenge for many organizations. Advancements in technology have given organizations a plethora of IT options from which to choose for meeting connectivity, communications, and security requirements. The lack of funding to support knowledge sharing initiatives, however, has been a major constraint to the type of technology an organization could ultimately select. As a result, the organizations OIG studied found it best to first examine their current systems to determine what might be leveraged to support their collaboration initiatives before spending money on new or additional technology. Where possible, organizations also considered commercial off-the-shelf solutions before undertaking new developments. Once systems were implemented, organizations recognized the need to periodically reevaluate systems operations and make adjustments to respond to changing business requirements.

For example, the Army conducted an intense, multiyear study of several commercially available products before deciding to develop its Army Knowledge Online portal. The Army's chief technology office and knowledge management group worked with users and external entities to develop requirements and identify effective practices to incorporate in the system development. They had no direct allocation and therefore had to use year-end funding to acquire the system. The portal operates on the Army's existing unclassified and classified network infrastructures. The Army is currently using version 3 of the portal, which has evolved over time to respond to changing user needs.

Managing and Sustaining IT and Data

Implementing modern KM technology without provision for its management and upkeep can ultimately render a system useless. As part of their systems initiatives, KM officials must consider how both technology and its information content

will be sustained on an ongoing basis. The quality of an IT system can become irrelevant if the developer leaves no documentation for future reference or if the vendor is no longer in business to support system operations. Ongoing security controls are necessary to safeguard communications from intrusion, or unauthorized access.

Failure to manage data content could result also in poorly functioning or underused KM systems with stagnant, inaccurate, or outdated information. For example, a database of expertise initially created in the IDB's financial sector is not being updated because of a lack of funding and tools to maintain it. Inadequate content management also contributed to the failure of UNICEF's initial "Knowledge Network." There was only one content manager posting information to the network every six months, leaving its content out-of-date for the greater part of the year. As a result, the system never succeeded. Content management remains a problem for UNICEF's current Intranet. Lacking a formal, central means of governance, individual organizational units have scattered the same information on the Intranet in various locations.

The organizations OIG studied, especially those with large systems, have increasingly come to recognize the need to designate individuals with responsibility for equipment and content management from the outset of their KM system initiatives. Among these organizations, the responsibility for managing the systems included a range of officials, from administrators and KM coordinators or facilitators to systems officials and database managers. Some organizations used multiple content managers. For example, each KM community at FHWA has an administrator or site manager responsible for monitoring web portal content and activity and posting new information. The web site managers are subject-area experts, who also coordinate online discussions, weeding out inaccurate or inappropriate information. (See the case study.) Further, each of UNDP's nine main networks has a facilitator responsible for managing list servers and making online discussion questions and answers more direct and useful. A KM coordinator works with the facilitators to increase sharing and consistency across the networks.

Principle V: Using Information Technology in KM

Case Study on the Federal Highway Administration

KM at FHWA began with efforts to improve information and knowledge sharing among engineers on the design, construction, and installation of rumble strips.[4] FHWA serves as a broker of this information to state and local governments nationwide.

In 1980, FHWA engineers in several states demonstrated the effectiveness and life-saving benefits of rumble strips. However, the information was not readily available to other officials nationwide who needed it. FHWA initially sent out paper copies of the information, but this process proved too static, leaving recipients with inaccurate or old data although new information had emerged. FHWA considered providing the information on compact disks, but this method was inefficient as well. The solution was to create a KM community of people working with rumble strips, and a collaborative web site to support peer exchanges through online discussions and the posting of current rumble strip engineering information.

FHWA officials called the rumble strip community discussions "rolling meetings," which focus more on the data sharing among engineering experts than on the IT used to support their exchange. Their web site is replete with reports by highway safety engineers, policies on rumble strips, success stories, and videos of leaders in rumble strip installation. The web site has one manager—a rumble strip expert—who monitors all online discussions and responds to questions. The knowledge exchange in this rumble strip community has helped accelerate rumble strip installation and reduce the number of highway fatalities. FHWA officials have gone on to create many more KM communities based on the success of this project.

Case Study on an Industry Research and Development Organization

In contrast to FHWA, an industry research and development organization focused primarily on instituting technology to support its KM approach because its culture already supported collaboration and leveraging knowledge from previous work to facilitate new projects. The corporation has a central portal to link the many Intranets of its five component organizations. The central portal is automatically updated as changes are made or new information is added to the Intranets in the sublocations. The portal incorporates a number of features—file sharing, online collaboration, search engines, video-streaming, and list servers—to support business operations and promote a sense of community across the corporation. The central portal also has an online directory that includes employee profiles, resumes, and information to help in identifying individuals with special skills to meet specific needs. In addition to the central portal and associated Intranets, the corporation has developed several Extranets to support interaction with government sponsors. Several component organizations are planning to create their own Extranets to run applications and move beyond mere file sharing.

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[4] Rumble strips are textured or audible/tactile treatments of paved roadways to warn and deter drivers from leaving their travel lanes, running off of the road, or having head-on crashes.

MEMORANDUM

June 4, 2003

TO: OIG – Anne Sigmund, Acting

FROM: M/EDIP – James F. Holmes

SUBJECT: *Knowledge Management at the Department of State:*
           Learning from Successful Principles and Practices, OIG
           Draft Report Number IT-A-03-08

The Office of eDiplomacy appreciates the opportunity to comment
on the draft report.

We believe the report makes a significant contribution to the
development of a systematic approach to knowledge management in
the Department of State. In our own study of knowledge
organizations and of the current status of knowledge management
in the Department, we have reached essentially the same
conclusions as the OIG regarding the goals, hurdles and success
factors that must inform a Department-wide KM strategy.

Our emerging strategy proposal will address all of the issues
raised by the OIG. Therefore, we welcome the report as an
independent validation of the direction that we believe the
Department should take.

We recommend several clarifications to the text of the report.
They follow below.

<u>PROPOSED CHANGES</u>
(Explanations in parentheses)

<u>Page 5, first paragraph under "Results in Brief."</u> Please change
last sentence to read:

> "The Office is undertaking a number of knowledge sharing
> initiatives, including greater use of existing classified
> and unclassified government networks for information
> exchange and collaboration, as well as the Group of Eight
> *(G8)* Knowledge Management Project."

(As drafted the sentence implied that eDiplomacy is coordinating
A/CAI, which is a completely separate office. Moreover, we see
the expanded use of existing networks (SIPRNet and OSIS) as a
major step forward for the Department.)

<u>Page 8, 3rd paragraph under "Department Efforts to Institute
KM."</u>

In the first sentence, please delete "by November 2002."

(The Under Secretary did not set a deadline for development of a
KM strategy.)

Please change the last sentence, to read, "Along with the
Department's e-Government initiative, to which the Office of e-
Diplomacy contributed significantly…"

  (M/P directed the overall eGovernment initiative. The
eGovernment strategy emerged from a small, multi-bureau drafting
group chaired by eDiplomacy.)

<u>Page 9, 2nd full paragraph, penultimate sentence</u>

> Please replace "for U.S. embassies in London and Budapest"
> with "by Department bureaus and posts worldwide."

(The Portal X project has expanded beyond Budapest, which
piloted the software, and London, which followed Budapest as an
early and active adopter. Our goal is for all CCP posts to be
able to establish classified homepages by the end of 2003.
Moreover, the original language inadvertently implies that
information exchange and knowledge sharing were intended only
for State entities – our goal is to use classified homepages as

a channel for publishing reporting and analysis that will benefit all USG users of the classified network).

<u>Page 9, last sentence, paragraph under "Other Ongoing KM Initiatives."</u>

> Please change last sentence to read, "The Office of eDiplomacy is working to learn from, cooperate with, and in some instances assist, these activities."

<u>Page 11, sentence that ends at top of the page.</u>

> Please add, "The Office of eDiplomacy chairs an interagency working group that is exploring ways to expand collaboration via OSIS. Under eDiplomacy's direction, a suite of State administrative services identified by foreign affairs agencies as high priority have been made available via OSIS. Moreover, eDiplomacy has supported efforts to use OSIS as a means for connecting INS to the Department's consular affairs database, which is important for homeland security."

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LIST OF ABBREVIATIONS

A/CAI   Bureau of Administration, Center for Administrative Innovations

DISA   Defense Information Systems Agency

FASI   Foreign Affairs Systems Integration

FHWA   Federal Highway Administration

FSO   Foreign Service officer

G8   Group of Eight

GAO   General Accounting Office

ICZ   Interagency Collaboration Zone

IDB   Inter-American Development Bank

IRM   Bureau of Information Resource Management

IT   information technology

KENSTEER   Knowledge Exchange Network Steering (Committee)

KM   knowledge management

NASA   National Aeronautics and Space Administration

OIG   Office of Inspector General

SURF   Subregional Resource Facility

UNDP   United Nations Development Program

UNICEF   United Nations International Children's Emergency Fund