Federal Intranet Work Sites:

An Interim Assessment

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Julianne G. Mahler
Associate Professor
Department of Public and International Affairs
George Mason University

Priscilla M. Regan
Associate Professor
Department of Public and International Affairs
George Mason University

The PricewaterhouseCoopers Endowment for
The Business of Government

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F O R E W O R D

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On behalf of The PricewaterhouseCoopers Endowment for The Business of Government, we are pleased to present this report by Julianne Mahler and Priscilla Regan, "Federal Intranet Work Sites: An Interim Assessment."

This report is the Endowment's 12th study in its E-Government series. This is the first study, however, to examine how the federal government is using Internet technology to communicate and provide services to its own employees. Numerous previous studies, including those by The Endowment, have examined government's ability to provide services to both citizens and businesses via the Internet. There have been far fewer studies of how government has developed and used intranets for its own internal purposes.

While the federal government has made great strides in improving its ability and capacity to deliver online services to the American people via the Internet, it appears that the federal government is not using intranets to deliver a full portfolio of services to its own employees. Based on case studies of six federal departments and agencies, the government seems to be providing limited online services to employees. Most departments and agencies examined provide information, such as employee benefits, online but have developed limited transaction capabilities to date. In addition to providing findings, Professors Mahler and Regan set forth three key recommendations on actions that federal departments and agencies can take to more fully utilize the potential of intranets to improve services to their employees.

We trust that this report will be useful and informative to government managers as they increasingly turn their attention to how Internet technologies can be used to enhance the productivity of their own employees and to increase internal services to those employees. The federal government has made great strides in recent years in providing on-line services to the American public. The next set of challenges is in its own backyard—providing services to its own employees.

Paul Lawrence
Partner, PricewaterhouseCoopers
Co-Chair, Endowment Advisory Board
paul.lawrence@us.pwcglobal.com

Ian Littman
Partner, PricewaterhouseCoopers
Co-Chair, Endowment Advisory Board
ian.littman@us.pwcglobal.com

EXECUTIVE SUMMARY

Intranets linking Government to Employees (G2E) are the subject of this study. A number of federal agencies have reported efforts to use some form of intranet, but the complexity of these intranets and their actual levels of use vary widely. For example, as part of the Internal Revenue Service (IRS) reform effort, intranets are used to provide a communications strategy for informing staff about changes in tax law, policy, and procedures, and for improving agency-wide communication (Letter Report, 04/21/2000,GAO/GGD-00-85). The National Resources Center, the IRS's intranet website, was created in 1998 to serve as a site for centralized guidance on policy and procedures, to provide a way to disseminate answers to employees' questions so that all staff would have the same answers, and to provide training for the provisions of the reform.

Other examples of intranet uses for management are included in the General Accounting Office's (GAO) report on successful strategies for enhancing agency information and knowledge management (GAO/GAO-01-376G). A number of agencies, for example, use a service that makes press clippings available to staff, a significant improvement in speed and cost over traditional methods. In the Veterans Health Administration, intranet access to performance information such as patient satisfaction data is used to encourage performance improvement (GAO/GAO-01-376G).

This study is concerned with identifying the uses of intranets in federal government agencies. First, we ask, what are the present capacities and designs of intranets in use? Secondly, why have agencies developed their intranets, and what value do they envision they will gain from them? Information about capacity and purpose will make it possible to know how to work with agencies to enhance their systems and to move from current designs to ones that will do more of the work they would like them to do.

To answer these questions we studied six agencies. We interviewed individuals at the Departments of Transportation, Housing and Urban Development, Commerce, and Justice, as well as the Environmental Protection Agency and the General Services Administration. Our rationale for this selection was to optimize the chances of finding the most advanced and sophisticated examples of intranets. Case studies of agencies with little or no experience with intranets would not offer much about their potential or the directions in which agencies want them to develop. The emerging vision of intranets as key management tools in government is more easily observed in agencies that are more advanced in their exploration of intranet uses and limitations.

Cases

Department of Transportation (DOT)

In the Department of Transportation, existing intranets in each of the agency's 11 operating divisions preceded efforts to establish a single, unifying intranet. Management designers hoped to carve out a place for a department-wide intranet by identifying crosscutting features. Efforts to make the site attractive included using existing terminology rather than requiring users to learn a new

vocabulary of work functions. Another appealing feature is that each worker's home page can be personalized. A feature allowing interest-based groups to form and to collaborate online has drawn many adherents.

Department of Housing and Urban Development (HUD)

In contrast to the Department of Transportation, the HUD@work intranet was the only internal net in place. It developed rapidly as a communications tool. The HUD intranet had a staff separate from the Internet team, which is unusual, and headed by a manager who designed it to carry out management tasks. The intranet had top-level support from the HUD secretary and was designated as the site to report downsizing decisions. All these factors have contributed to very high use rates.

Environmental Protection Agency (EPA)

A team of information resource management professionals created the EPA intranet. The first version was composed of text-based links. Despite the capacity of the intranet to support chat and collaborative work, respondents suggest the site is underused. Major marketing efforts are under way.

General Services Administration (GSA)

The intranet at GSA was created by a former private sector web designer. Travel and human resources links were among the first ones offered. Over two years the site grew in features and popularity. Now it is a work site for conducting the business of the agency as well as a document site. A simple bulletin board site increased in use when the head of GSA began to monitor it and make comments. Here staff could be heard. Rewards for good suggestions made on the site have further increased its worth.

Department of Commerce

The Department of Commerce intranet, like the one at the Department of Transportation, faces challenges because of seven pre-existing divisional intranets. Investigation of one of these intranets, in the Commercial Service, indicates that it is a well-developed collection of work tools for identifying client matches and scheduling events at which matches may occur. The site is a joint product of

a few contractors and Commercial Service staff. The intranet for the department as a whole was built quickly in response to administration calls for "digital democracy." It has functioned as a document site with an information resources management design team. Visits to the site have not been as numerous as designers had hoped, and efforts are under way to improve its usefulness.

Department of Justice (DOJ)

Like Commerce and Transportation, the Department of Justice houses a number of agencies with separate identities and their own intranets. Both the external website and intranets are maintained and designed by the same staff group, composed of computer technicians and library information resource specialists. The intranet content is now a component of the DOJ library, which is developing an information resource management specialty. The site is largely non-interactive at present. It offers links to the most recent department policy files and government sites. The next generation of the intranet is to be more interactive, but this will take a major change in architecture and represents a huge investment. The information resource staff will depend on the Internet website builders in the department for this advance.

Findings and Recommendations

The lessons learned from the six cases can be distilled into a set of five overall observations.

- In large multi-divisional agencies, divisional or regional intranets predate the agency-wide intranet and pose challenges for establishing a niche for an umbrella intranet.

- Top departmental support for and interest in the agency's intranet is especially critical in the initial planning for and launching of the intranet.

- Marketing of an agency-wide intranet is crucial to encouraging staff use.

- Within federal agencies, more attention and energy is devoted to the agency's public access website than to its intranet.

- In all the agencies examined, the development of the intranet has been an iterative process and is still very much evolving.

Based on the analysis of the case studies, we offer three recommendations for enhancing intranet development in federal agencies.

- An agency-wide intranet requires an agency-wide effort to be successful.

- The more that intranets provide services that employees can use on a day-to-day basis, the more employees will gravitate toward the site.

- As intranets become more personalized and are used more for collaborative work, agencies will need to address issues of workplace surveillance and monitoring.

Models of Intranet Use

Background

The growing interest in intranets is spurred by their usefulness as management tools to foster productive communication and coordination, manage information, and encourage self-organizing work teams. Business to employee (B2E) intranets in firms are developing rapidly because of their advantages in optimizing strategic communications. Allcorn (1997) identifies the "parallel virtual organization" composed of an intranet and organizational databases as the information and knowledge management model for the future. Curry and Stancich (2000) identify the advantages of the intranet for strategic decision making. Southwest Airlines is cited by the General Accounting Office as an exemplar of the uses of intranets for informal communication among employees at dispersed work sites to develop and maintain a culture of teamwork and pride (GAO/GGD-00-28).

Here we pose two principal questions about the intranet in federal government settings. First, what are the present capacities and designs of intranets in use? What features do they have and how are they used? The second set of questions concerns why agencies have developed their intranets, what they hope to get from them, and what work they would like them to do. Information about capacity and purpose will make it possible to know how to work with agencies to enhance their systems and to move from current designs to ones that will do more of the work staff would like them to do.

Use of Intranets

Intranets are part of the larger e-government landscape that includes Internet services for citizens and commercial applications for businesses to ease and speed their relationships. HUD notes in their 2001 website that e-government is the interchange of value, including services and information, through an electronic medium, and includes relationships between:

- Government and citizens

- Government and nonprofits

- Government and business

- Government and employees

- Government and government

Similarly, Stowers' study of e-commerce applications in the public sector distinguishes e-government operations that link governments to citizens (G2C), governments to business (G2B), and business to government (B2G). Government to citizen transactions online include a number of services allowing citizens to obtain copies of vital records, pay fees, renew licenses and registrations, file and pay taxes, and bid at government auctions (Stowers, 2001). Government to business e-linkages include opportunities to file taxes, obtain licenses and permits, and purchase government services. E-commerce applications between businesses and government include creating software to simplify purchasing and improve agency productivity. For

example, the Department of Defense EMALL operation provides one point of entry for Defense customers to buy goods and services from commercial vendors and other government sellers. (Stowers, 2002, 26). Stowers also found applications of government to government e-commerce in Washington State's Central Stores Online, patterned after commercial online retail shopping sites.

In contrast to these applications, intranets are typically newer applications that emerged in the early to mid-1990s in the private sector and, based on our respondents' accounts, mainly after 1997 in federal government agencies. Intranets are websites within government agencies that connect the government agency to its employees and the employees to each other. In large multi-agency departments such as the Department of Transportation, intranets may be nested so that department-wide intranets and agency-specific websites operate simultaneously.

Information in bulky and expensive directories and manuals of policies and procedures can be provided in a more convenient, easy-to-find, and timely way in an internal web network. Intranets make it possible for employers to communicate quickly and efficiently and to save time and money in the dissemination of news and policy changes. Intranets may be principally portals linking employees to static information resources, or they may include interactive elements that provide human resources services such as the Employee Express payroll contract service. Some offer chat rooms where employees can communicate outside of formal channels, air grievances, and seek solutions.

We will describe cases in which the intranet has become a host for virtual meeting places for communities of interest that may yield program innovations or policy ideas. This communication function in at least one of the cases described here has spurred efforts to use the intranet as a vehicle for trying to foster the emergence of an agency-wide culture, not weakening the strong divisional cultures but encouraging an overarching mission and identity.

The scope and complexity of agency intranets appear to be somewhat more limited than those found in corporate settings. In corporations, appli-

cations range from functional web-based solutions for a single process such as travel arrangements to a multifunctional array of portals that create a personalized work setting for employees. In government agencies, single functional solutions, such as Employee Express, make it possible for employees to enter changes in payroll information directly without the intervention of human resources actors. We found no cases, however, of functional portals in which such web solutions fully covered an entire organizational process such as human resources (HR). Except for Employee Express, intranets were used to provide information to help employees find out how to request needed services from the HR offices.

In many cases we found that federal agencies were using intranets as "thin portals" to communicate news and policy changes to employees as well as offering a reliable, updated place to find information about existing programs and procedures. We did find cases of agencies working toward "fat portal" solutions by creating opportunities for the creation of self-organizing communities that could foster e-learning (see Figure 1). Similarly, we uncovered one case in which the department-wide intranet had been created to foster cultural unification; however, no evidence of success was noted by agency actors.

In the literature, a number of federal agencies have reported plans to use some form of intranet, but the extent of the content and the level of actual use in agencies vary widely. Before moving to the details of findings in this study, the efforts in other agencies might be noted. For example, intranets are central to the IRS reform efforts by providing a communications strategy for informing staff about changes in tax law, policy, and procedures, and for improving agency-wide communication (Letter Report, 04/21/2000, GAO/GGD-00-85). The National Resources Center, the IRS's intranet website, was created in 1998 to serve as a site for centralized guidance on policy and procedures, to disseminate answers to employee questions so that all staff would have the same answers, and to provide training for the provisions of the reform.

The difficulties the IRS had in setting up the National Resources Center are typical of the problems we found in intranet development. Many staff

Figure 1: How Organizations Are Using Intranets

Degree of Complexity		Narrow	Wide
	High	**Functional Portals** Deliver a single management function (e.g., HR, Finance)	**Fat Portals** Complex, multifunctional, enterprise site which creates a personalized work environment
	Low	**Functional Solution** A web application of a single management process (e.g., new hire, travel)	**Thin Portals** Delivers organization's information and provides linkages to other intranet sites
		Narrow	Wide
		Organization Scope	

(Diagram adapted from PricewaterhouseCoopers, Introduction to B2E and G2E Solutions, April 1, 2001)

did not have computers that could access the intranet and others were unaware of the site. These problems limited the success of reforms designed to bring consistency to procedures in the IRS.

Other examples of intranet uses for management are included in the GAO report on successful strategies by chief information officers for enhancing agency information and knowledge management (GAO/GAO-01-376G). In one case, the intranet at the Agency for International Development was used to make press clippings available to staff, a significant improvement in speed and cost from traditional methods. In the Veterans Health Administration, intranet access to performance information such as patient satisfaction data is used to encourage performance improvement (GAO/GAO-01-376G).

Many have noted the uses of intranets for speeding and personalizing human resources functions in organizations (Holz, 1997). GAO reports uses of intranets in private firms to foster human capital development that can serve as models for governmental agencies (GAO/GGD-00-28). Integrating human capital staff into management teams directly or via an intranet is seen as an exemplary development. GAO also reports on an exemplary use at Federal Express, where senior managers apply an automated intranet-based tool to assess the leader skills, potential, and development needs of

mid-level managers so that new assignments and promotions can be made quickly and effectively.

How relationships between governments and employees can be facilitated through the use of intranets is the focus of the research here.

Field Research Questions and Hypotheses

Based on the development of intranets and e-government solutions in the federal government, we expected to find a range of intranet designs and purposes—from simple newscasts to sophisticated portals linking employees to sites for human resources needs, travel planning, training, and self-designed collaborative linkages. In fact, we found a narrower range of designs than expected. The reasons for this and other patterns in the development of intranets emerge from the individual case studies.

The examples are based on case studies in six agencies. We interviewed several individuals in the Department of Transportation, the Department of Housing and Urban Development, the Environmental Protection Agency, and the General Services Administration. We interviewed several respondents in different offices of the Departments of Commerce and Justice, which are multi-agency departments with complex intranet structures. We began to identify these agencies, and the offices and actors

within them, from leads provided by the Chief Information Officers Council, its E-Government Committee, and its Intranet Roundtable. Additional contacts were recommended by these actors. Our rationale for this approach to selecting cases was that we wanted to optimize our chances of finding the most advanced and sophisticated examples of intranets rather than a representative sample of all stages of intranet development in federal agencies. Case studies of agencies with little or no experience with intranets would not offer much guidance about the potential of intranets or the directions in which agencies want them to develop. The emerging vision of intranets as key management tools in government is more easily observed in agencies that are more advanced in their exploration of intranet use and its limitations.

We posed questions about the current state of agency intranets, their origins, and major changes to the site. In several cases we were able to document the design of sites at different stages of development. We questioned actors about the original purposes and motivations behind intranet creation. We tried to determine what pressures within the federal setting might encourage intranets. We also probed the sources and level of resources available for development. The composition and mission definition of intranet development teams were investigated. Agencies differed in whether the intranet was allocated its own team or had to share resources with Internet staff. Some agencies put web technicians at the head of projects while others placed managers in charge. As research progressed, we also became aware of the need for agencies to encourage intranet recognition and usage, and so we came to collect stories about how the intranet was marketed to agency staff. Finally, we investigated other factors that appear to have encouraged or impeded intranet development. We turn next to the details of these cases.

Design and Development of Intranets in Federal Government Agencies

Department of Transportation (DOT)

The director of the Department of Transportation intranet development team also heads up the Intranet Roundtable of the E-Government Committee of the Chief Information Officers Council. The director came to DOT after successfully creating an intranet at the Department of Housing and Urban Development (HUD). The task set for the director was to create a single intranet for DOT's 11 operating divisions, including the Federal Aviation Administration, the U.S. Coast Guard, and the Federal Highway Administration. Each of these already had a functioning intranet, and the administration at DOT believed that strong cultural identities within some of these divisions prevented a single DOT ethos from emerging. It was hoped that the intranet could foster the development of an overarching DOT culture by generating strong linkages across divisions. There was strong top-level support for this objective from then DOT Secretary Rodney Slater.

In the summer of 2000, a reorganization created an e-government unit within the newly designed Office of the Chief Information Officer. There were few resources available for intranet development. Perhaps even more important, however, the intranet team was tasked with creating and maintaining both the department's Internet website and its new intranet. The intranet shared resources with the better recognized and established external website. The existing intranet was a static page with few features and low usage.

Shortly thereafter, in September 2000, a contract for a new intranet was negotiated, and a new prototype was tested in December. Then followed an intense period of consultations with managers and incorporation of their suggestions into the new site. Buy-in by the central and divisional managers was seen as key if the new agency-wide intranet was to be a success, given that there were already as many as 11 intranet sites within the department. In considering what new features might be appealing to department employees, the team director focused on crosscutting issues and services. Though in many cases human resources functions are crosscutting, here they were already decentralized into the divisions. Instead, the director considered what the central site could offer in the way of communication and information resources. Online communication, e-mail, chat rooms, and access to performance measurement databases were designed into the system. Design choices were made to use known terminology and management categories rather than requiring employees to master new website language. This simple principle was credited with contributing to the later success of the site.

Standard elements available on each employee home page include:

- Links to organization and budget information
- Breaking news features and access to online news services, news clippings, and specialized transportation publications
- Archives of past announcements

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Figure 2: Department of Transportation Intranet Home Page
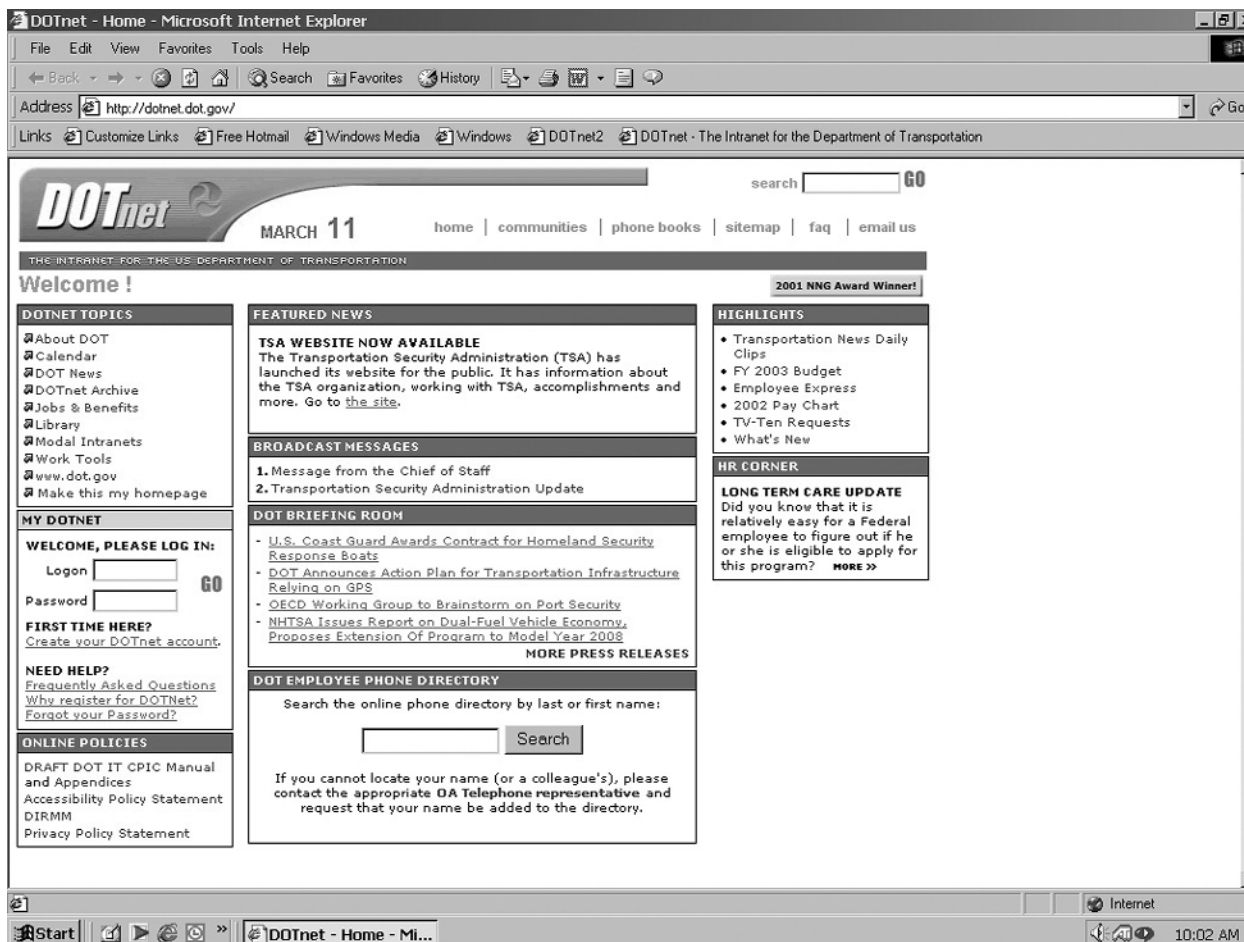
- Library resources, including links to the in-house library, online publications, policy statements, reference works, and other government document repositories including GPO [Government Printing Office] Access and FedWorld

- Work tools such as proprietary online collaboration software, databases and analysis software, and work-related forms

- Feedback links to intranet designers

- Department directory

- Department-wide human resources program information, including information about awards, benefits, wellness programs, job opportunities, training, and information about balancing work and family

- Department calendar

An important characteristic of the new site, and one that designers were particularly happy with, is that employees can personalize the content of their home page on the intranet. Each employee can create his or her own version of the elements listed above. The DOT intranet team had investigated the use of portal technologies but found them to be too expensive and decided to use existing software that enabled some level of personalization. A personally selected menu might include pages for:

- Personal calendar

- Administrative tools

- Modifying links to self-selected virtual groups and communities, as well as group sites

- Dictionary

- Weather

- Google

The next-generation intranet is now in design. It will feature interactive travel and training features for generating tickets and arranging for training rather than offering only forms and information about procedures and policy, as in the 2001 version.

Another important innovation at DOT is that employees can initiate online groups to collaborate about task issues or emerging program interests. Standardized templates for the groups make it easy to create a group and put up content on group spaces. Some groups have spawned subgroups interested in collaborating on particular problems or work issues. A page called "My Modules" offers tools for creating and altering the personalized home page, and for creating and altering content and membership on group pages. The content modification page offers a menu-driven method for:

- Creating, modifying, or deleting new content in groups

- Creating a new group

- Managing new group memberships

- Managing the group bulletin board

- Reviewing feedback on the site

- Creating a calendar event

- Creating a link to a group

- Creating an employee recognition article

There are few procedures, or barriers, for volunteers who want to join, create, or volunteer to head a community of interest. Groups can be open or private, and content can also be private to the group, encouraging use of the virtual groups for controversial or embryonic ideas. Documents and content can be uploaded to a bulletin board. Conversation takes place through chat rooms that can be open and public or password-protected and private. There is no group writing or special collaboration software such as Lotus Notes in use nor is it planned. Rather, access is kept simple and transparent. Open and closed groups can be created, and members can be limited and, in some cases, removed. The web administrator can also monitor a community and remove members. Groups form and disperse as needed.

The object, of course, of making it easy to form these groups and share information is to foster intra-agency communication and collaboration and thereby encourage a unified DOT-wide culture, or "One DOT." The organizational effects of fostering the online communities may be more complex and useful, however. These groups constitute a kind of self-organizing process that may lead to new multi-agency projects and smoother interdivisional policy development. They may also spawn innovations in program ideas as agents from different sectors of the department chat, complain, or join forces to tackle problems.

While there has been no evaluation of whether a unified culture or self-organizing teams have emerged, there is evidence that the 2001 design changes have made the site far more attractive and useful than its earlier version. In May 2001, before the new design was online, there were 278,000 hits to the site, while in July 2001, after the changes, there were 2,700,000 hits. While these increases are large, they also represent a great deal of effort to prepare managers and staff for the changes and encourage them to use the site.

The intranet team leader attributes the relative success of DOTnet to at least three key factors:

- Putting managers in charge of design decisions

- Working with managers to identify useful Intranet functions

- Gaining the active support of top management in promoting the use of the site

Putting program and personnel managers rather than web technicians in the lead in design was important to the success of the DOT intranet, as it had been at HUD. Rather than allowing technical capacity to shape the design of functions, terminology, and layout, the intranet team leader gave managers, among whom she includes herself, the task of determining what information would be useful. Rather than making employees learn the web design program terminology, language already in use was employed. New ideas emerged from discussions with departmental managers and were pilot-tested with them.

Lessons Learned

- High levels of use and acceptance do not happen as a matter of course. High levels of use must be designed into to the site with self-consciously user-friendly terminology and functions that make sense to organization members and clearly contribute to their ability to do their work. Intranets built to demonstrate progressiveness through digital management do not convince members of their usefulness.

- Design decisions placed in the hands of managers make intranet applications that contribute to management tasks, especially communication and coordination.

- Group membership rises when employees are allowed to form their own groups and conduct group work with some autonomy and privacy (though actual contributions to management effectiveness and self-organization are not known).

- When intranets and the public access website must share design and maintenance teams, the intranet is likely to have a lower priority.

- Multiple divisional intranets make the creation and use of an umbrella intranet challenging.

Department of Housing and Urban Development (HUD)

The Department of Housing and Urban Development has had five iterations of its intranet beginning in November 1996. The first four, called "HUDweb," were referred to as "HUD's Internal Information Network." From 1996 to 2000, the HUDweb was modified on a yearly basis, with the goal of simplifying the website and making it more useful to employees. A major rethinking and revision of the website occurred in 2001 with the unveiling of a customizable intranet renamed "hud@work."

In August 1996, HUD decided to "add on" an intranet in response to perceived management problems, especially breakdowns in communication. The initial idea for an intranet came from the technical team who worked on the public access website, but management staff wanted to play a prominent role in its development and design. The intranet was viewed as a management tool to improve communications. The idea was that the agency could "work smarter, not harder, without paper." From the beginning, the intranet, or HUDweb, had support from HUD's leadership. Although not directly concerned about the management problems and the potential of an intranet for solving those problems, then Secretary Henry Cisneros was taken with the Clinton administration's vision of the Internet as a superhighway and understood that a HUD intranet might contribute to getting computers into public housing.

The technical team that worked on developing the intranet was dedicated to that project and separate from the technical team working on Internet projects. The intranet team recognized that the audiences for the two systems were also different. In developing the Internet website, staff needed to think about how citizens and nonprofit groups were likely to use HUD's website. In developing the intranet, the focus shifted to thinking about how staff were likely to use the intranet. The assumption was that staff would not access the intranet for things specific to their program, but would want to be able to do things that were general to HUD as an organization, such as human resource information and tasks.

From August through October 1996, the intranet team worked with managers in general administration on developing the conceptual content. The intranet team reported to the deputy secretary. In organizing the planning for the intranet, management learned from its experience in the development of the HUD public access website, which included staff volunteers on a working group at the planning stage. This resulted in a large working group of about 35 people, mainly people with technical skills and without a department-wide perspective. There was no working group for the intranet but instead a small team including both management and technical people.

The team asked managers what questions they were asked most often. Generally, their responses consisted of basic information questions that entailed information exchange rather than problem solving issues. The team developed broad topics using an almost intuitive common sense understanding of what should be accessible on the intranet. In November 1996, a prototype of the first HUDweb was launched. Top-level support was key

Figure 3: hud@work Intranet Home Page

at this stage. Indeed, the information technology director had a blank check to work toward the success of the prototype. The intranet team held briefings and worked through a network of staff to encourage use of HUDweb. Although the intranet had support at the secretary's level, managers within HUD often regarded it as the Internet's "baby sister" and saw the public access website as the primary electronic work site.

As is often the case in technological adoptions, exogenous events played a critical role. Shortly after the launch of the second version of HUDweb, Congress proposed abolishing HUD, and Secretary Cisneros decided that the intranet would be a good way to communicate with staff about the future of

HUD. The resulting information campaign brought employees to the intranet on a more routine basis. When staff accessed the intranet, they first saw a message from the secretary in the center of the home page. During the tenure of Secretary Andrew Cuomo, there was further development of intranet content with particular attention to what was important to the staff. The intranet home page was organized by topics: What's New; Feature; Home Page; and Highlights.

The availability of information in both paper and electronic forms posed a problem in terms of generating and sustaining employee use of the intranet. If information was sent to all employees or posted on bulletin boards, then employees had less reason

to access the intranet. A major boost in intranet use occurred when the Office of Personnel ceased printing vacancy announcements and posted them only on the intranet. When Secretary Cuomo announced there would be a cut in HUD staff from 12,000 to 7,000 and suggested that staff check HUDweb the following Monday for job announcements, the server crashed.

At the time of budgetary cutbacks, the intranet offered a chat room for staff to post comments anonymously. The purpose was to enable employees to discuss issues associated with managing change in the agency. The chat room was moderated by a chair, and both the secretary and deputy secretary participated for a while. There were 6,000 discrete users at one time. As the budgetary crisis passed, use of chat rooms diminished.

In 1998, there was a Web Awareness Day in Washington and in the regional offices to launch "two websites ➜ one hud" to teach staff the different benefits of HUD's public access website and intranet (see Figure 4). The message was that employees should use HUDweb—the intranet—to do their job; the deputy secretary's message was that the intranet was a "tool, not a toy." On the other hand, HUD's external website was designed for the public as a clearinghouse of information and services for consumers and business partners. As a result of this campaign, there was a doubling of intranet hits in six months, and that level of use was sustained for the next several years.

By 2000, HUDweb was four years old. With a consistent look and feel, it was used by employees in the field offices and Washington. It was operated by a small, centralized group. Employees' computers opened to HUDweb's home page with a focus and theme for the day. HUDweb was not personalized to each staff person.

One of the recurring problems in generating and sustaining employee use of HUD's intranet continued to be differentiating it from HUD's Internet website. The names of both were very similar: HUDweb and HUD.gov. The look and colors of the two websites were also very similar. In 2000 a contest was held to rename HUD's intranet. The new name, announced at a HUD Web Day, was hud@work. Red became the primary color for

Figure 4: HUD Intranet Flyer

HUD.gov; for hud@work, it was green. The motto "if it's green, it can't be seen" was crafted to remind employees of the difference between the two sites.

As a result of focus groups with employees, hud@work added a customization feature. When employees booted up their computers, the hud@work page appeared. Four items appeared on every employee's intranet home page:

• Daily message from the secretary

• Today's feature, which can be a news or personnel item

• Employee highlights including personnel announcements and an employee locator

• "What's New" feature, which includes personnel rule announcements and policy statements

Features that appear automatically in the left toolbar include:

• Chat

• Groups

• Handbooks and forms

- Headquarters offices

- Jobs and benefits

- Local offices

- Management

- Procedures

- Resources online

- Work online

- Suggestions

- Staff locator

- Search

Employees also have links to design the layout and content of the page. They can personalize other features they wish to include from five categories: hud@work tools, personal tools, working groups, Internet tools, and federal government tools.

The current iteration of HUD's intranet has virtual team technology whereby staff can exchange files, engage in real-time chat, teleconference, work together from different geographic locations, and set up meetings. Although managers are keen on this capability in concept, they seem reluctant to use it.

Lessons Learned
- Intranets should be designed to work in harmony with the culture of the organization. Intranet modifications should involve employees in design and solicit feedback from employees on what is, and is not, working for them.

- Support at the secretary's level is similarly important for the intranet to be a department-wide success. It is likely that various bureaus or field offices within a department will initiate their own intranets. But the value of a department-wide intranet is that it serves a department-wide service and function. Although there is often field office resistance to Washington oversight, there is no need for field offices to duplicate the departmental information and services offered by the department's intranet.

- Development of the intranet should be driven by management goals and involve management staff. It should not be driven by the technical team alone. Indeed, a technical

perspective can limit the possibilities. If designers think in terms of what the technology can do, they are limited by the current hardware and software. Common sense and openness to new ideas appeared to be more important than a sophisticated understanding of the technology. Indeed, the most successful development pattern involved management staff developing wish lists of applications and the technical people then determining the operational capabilities.

- Marketing the intranet within the agency is also key to success. Throughout the development and deployment of the five iterations of HUD's intranet, the intranet team was conscious of the need to involve staff and managers, and to promote the advantages of the intranet. Slogans such as "smart HUD employees work online" were typical of these promotions. Two marketing campaigns were especially important at HUD: the 1998 campaign "two websites ➔ one hud" and the 2001 customizable hud@work, advertised as "HUD's Next Generation Intranet."

Environmental Protection Agency (EPA)

The EPA's intranet, EPA@Work, became available agency-wide in January 1998. The idea behind the intranet was to put information that is important to EPA employees at their fingertips: "Multiple sources of information to help EPA employees effectively do their jobs are just a click away." The latest iteration of the EPA intranet utilizes a new tasks and topics "portal" design by which EPA employees can quickly access agency processes and areas of interest by subject.

The first EPA intranet was not a spin-off from EPA's Internet site, but resulted from the realization that other agencies were developing intranets and that there would be value from an EPA intranet. A team of three, operating from the Office of Information Resources and Management but with support from the top of the agency, developed the prototypes of the intranet and oversaw its initial agency-wide deployment in January 1998. The members of the team all had some computer and technical background but were basically interested in information

Figure 5: EPA@Work Intranet Home Page
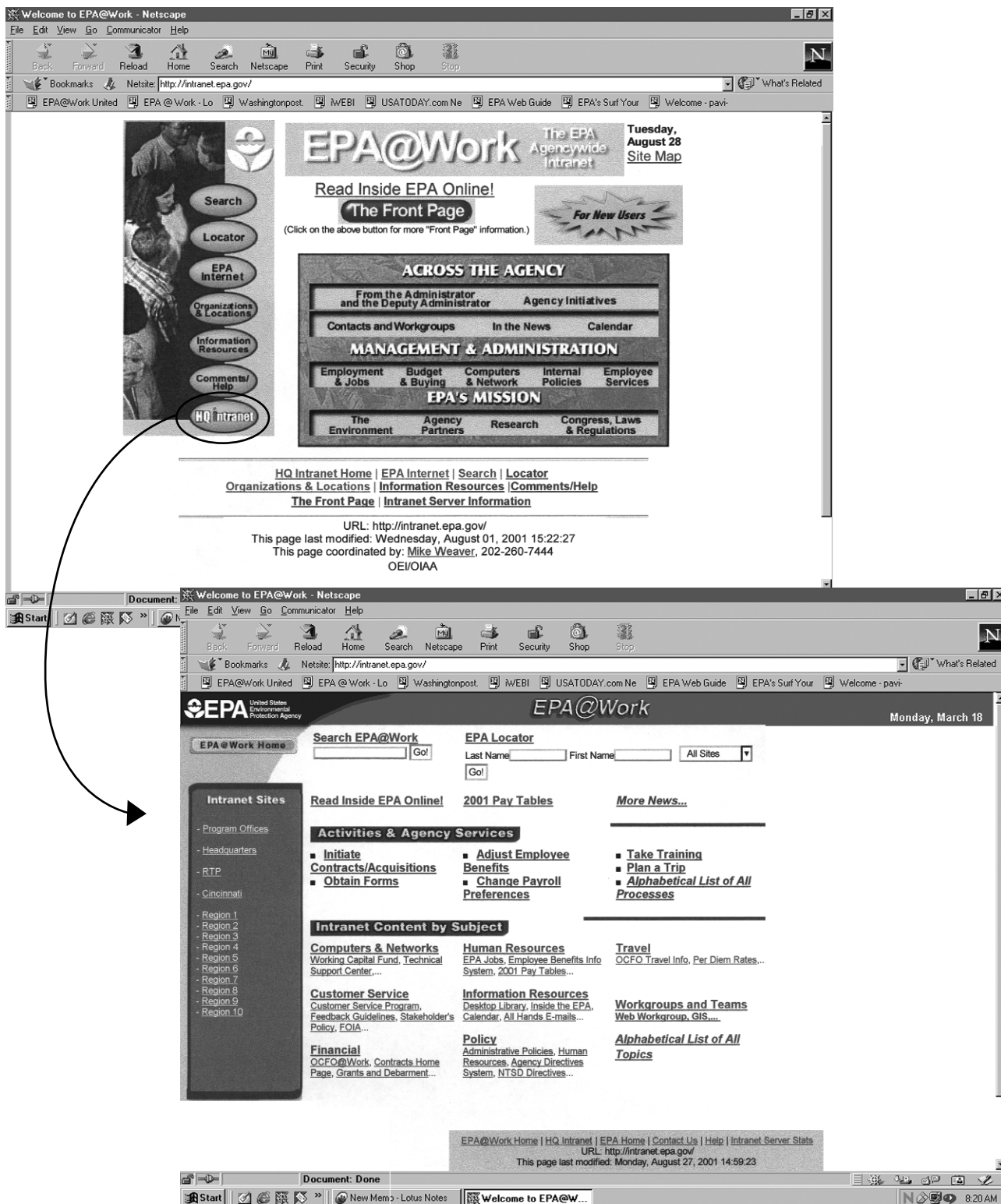
applications. In developing applications, team members interviewed managers of various programs to identify areas where the intranet might offer new opportunities. The intranet did not have its own budget; instead, funding came from the budget for the public access website.

Information was organized similarly on the EPA intranet and its Internet. In each case librarians catalogued metadata records using a hierarchy of control terms. In the case of the intranet, material was organized as text-based links under three main topics:

- Across the Agency—news from the EPA administrator, recent agency initiatives, contacts and work groups, news, and the calendar

- Management and Administration—employment and job openings, budgeting and purchasing, computers and networks, internal policy site, and employee services

- EPA's Mission—including major recent research initiatives, Congressional action, and access to both summary and full text presentation of the laws and regulations under which the agency operates

The links from the EPA@Work front page include:

- Search and locator functions

- Link to the EPA external website (epa.gov)

- Organization and locations with charts of headquarters and regional offices

- Information resources, with calendar and e-mail

- Links for comments and help

- Link to the headquarters intranet, with features for making changes in personnel documents, travel information and forms, customer satisfaction program, contract forms, human resources, and a link to information on administrative policies

Several other components of EPA, including the regional offices, had intranets of their own. The goal for the agency-wide intranet was not to duplicate these but to provide information and functions that were common to all EPA employees.

About 70 percent of the EPA@Work content has been facilities-oriented including activities such as office cleaning, copying, and parking. One function that employees have consistently used and found valuable is the "EPA locator" by which staff can find contact information for other employees and contractors. This function has been prominent on all iterations of EPA@Work. Another popular function involves forms and information on travel. Forms can be downloaded and printed, but cannot yet be completed and submitted online.

The EPA intranet offers the capability of work groups, chat rooms, and collaboration through its license for Lotus Notes and Lotus Notes Mail. These more interactive functions have not yet been used widely in the agency because of training requirements, firewalls, and costs. The intranet team recently had a demonstration of the PeopleSoft portal, which would allow customization and more collaboration and flexibility; this may be the next iteration of EPA@Work.

Lessons Learned
- Marketing of the intranet to employees has been important throughout its developments and deployments. At various points, "Intranet Weeks" were held when the intranet team did a "dog and pony" show to illustrate the benefits and capabilities of the intranet. Although attendance tended to be low at such events, the team found these to be an important way of publicizing the intranet. For the launch of the September 2001 iteration, the intranet team designed a "power-up with EPA@Work" campaign using an "Empower Bar" theme to convey the idea that employees who are hungry for information can get "vital, up-to-date information" by starting their day with the "new and improved" agency intranet. This campaign involved posters, flyers, and bookmarks with the same slogans and images.

- The EPA intranet team believed it was important to expand the intranet as the technology became available to do more on it. The team tended to develop its own software and not be constrained by what was available "off the shelf." Money was a constraint and affected what the team was able to develop; for example, portal technologies were too expensive.

General Services Administration (GSA)

The GSA intranet, InSite, was developed in 1996 as a result of an initiative offered by David Barram, the GSA administrator during the second Clinton administration. Barram had come from private industry, had a close relationship with AOL, and was surprised at the lack of online activities at GSA. GSA had developed an Internet site in 1994 for citizen and business access, but the site was not accessible from within GSA. There were some small intranets operating within areas of GSA, but no agency-wide intranet. At a GSA information technology meeting in 1996, Barram proposed that he order GSA to offer employees Internet and intranet access within four months, by Flag Day (June 14, 1996). The chief financial officer shared the view that an intranet would enhance GSA's ability to conduct its business. However, others feared that if employees were able to browse the Internet, they might be distracted by other online activities.

In response to the GSA administrator's proposal, the chief information officer (CIO) worked with a small team to make GSA's computer network Internet accessible and to develop a vision for an intranet. GSA's intranet was "home-grown," largely based on the experiences of team members in navigating Internet sites. There were five major categories of features for the GSA intranet including travel and human resources. The administrator, who retained a close interest and offered several ideas from his industry experience, named the site "InSite." The Office of Communications marketed the rollout on Flag Day 1996 and planned the official announcement. The rollout highlighted GSA's desire to have a useful site for its employees and emphasized the practical aspects of how to browse the intranet and the "do's and don'ts" of using it.

It took over a year before intranet use took off. Key to its success was having it become a work site, not just a document site. The bulletin board area of the intranet, called "My 2 Cents," was a popular feature that brought employees to the intranet. This began as an anonymous, open bulletin board for the posting of questions and answers, but problems arose as the comments digressed and some users failed to understand "netiquette." The GSA administrator intervened by monitoring the bulletin board, responding to comments, and offering cash awards for suggestions. He also encouraged other top executives within GSA to participate, but some managers were reluctant to reply by name.

As the intranet became more robust and more of a tool, employees gravitated to the site. Basic features such as a telephone directory drew people to the site. The intranet team still struggles with making it more useful to the end users. At this time, there is no collaborative work space on the intranet, but there are some pilots under way. Other methods of knowledge sharing, such as Lotus Notes and Quick Place, are being investigated. One idea that is attracting interest is using the intranet as a tool of "knowledge management," but at this point the terms and labels are somewhat fuzzy to managers, who are more business oriented.

Lessons Learned

- Functionality is key to success. If the intranet offers useful services, employees will come to it.

- Although the GSA-wide intranet was initiated from the top of the agency, top management encouraged experimentation and further development by others in the organization when it became available. Experimentation by subunits had benefits in that employees had some sense of ownership over the intranet and were enthusiastic about its possibilities. But this strategy had costs because employees created subunit intranets and quickly became more attached to them than to the GSA intranet.

Figure 6: GSA InSite Intranet Home Page
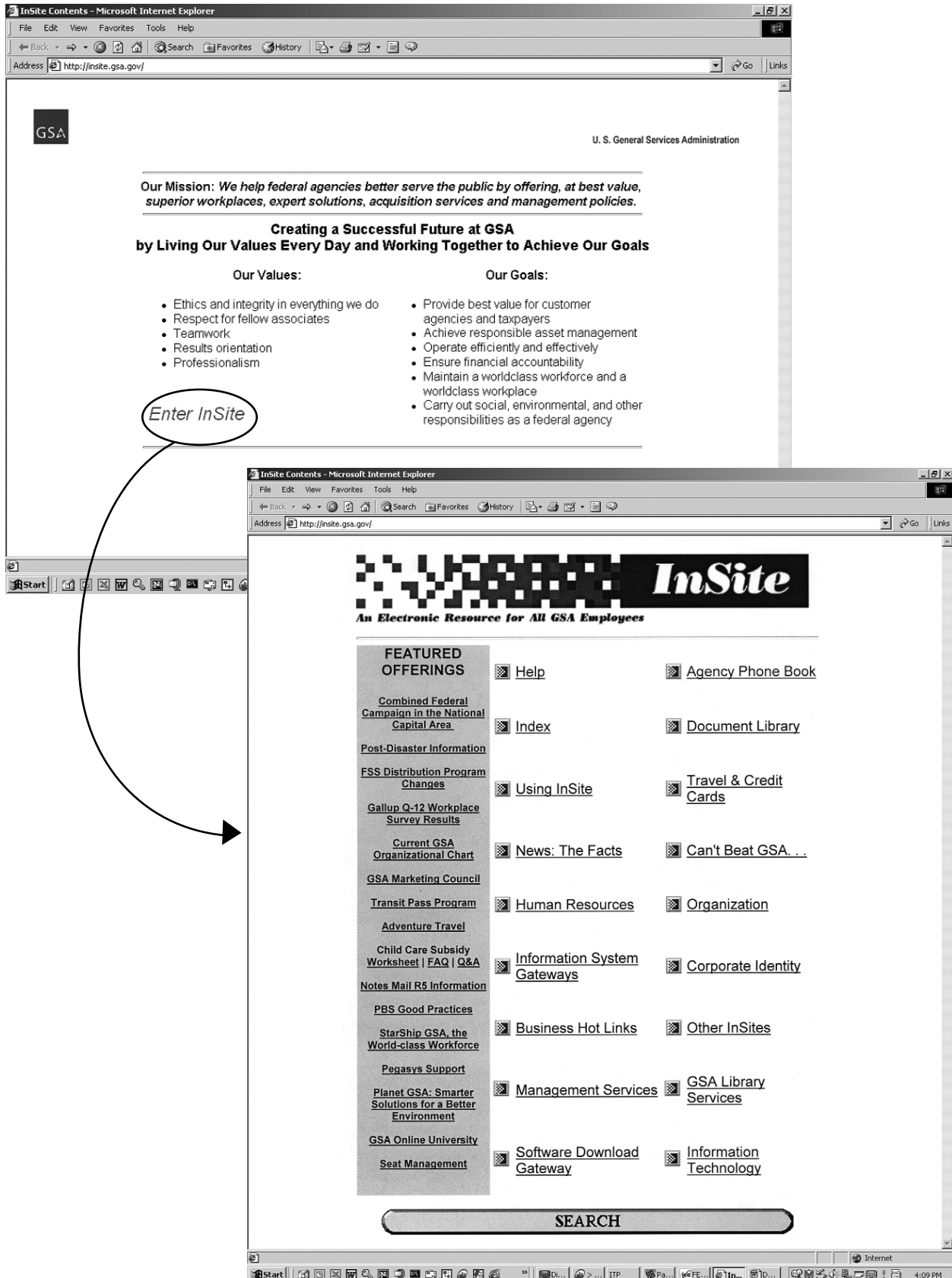
Department of Commerce

We were able to investigate intranet use at the Department of Commerce from two points of view. The Office of the Secretary houses the department's information resource management functions and supports the umbrella intranet for the entire department. The second perspective is from one of the seven operating units of the department, the U.S. Commercial Service, which maintains its own intranet. Like Transportation, the Department of Commerce is in some ways a holding company with separate divisions, each with its own strong identity, mission, and culture. This makes the development of an intranet challenging because it must overcome not only the typical resistance to new technologies, but also the insular tendencies of historically entrenched divisions.

CS Intranet. The intranet for the Department of Commerce's Commercial Service (CS Intranet) is much more elaborate and sophisticated than its department-wide counterpart, which is more of a site map or portal. The present Commercial Service site is the third-generation design, and staff expects only cosmetic changes in the immediate future, although eventually they expect to add a search function. The CS site is not personalized, though security and authentication were recent issues, and the site is password protected.

The reasons behind the construction of the site appear to be most clearly tied to the need to share business process software. The core task in the CS is to match business opportunities to interested investors here and abroad. Databases for each, categorized in various ways, allow CS staff to help accomplish this commercial matchmaking. Business process software and databases are shared on the intranet. The software helps staff coordinate events for bringing businesses together and make arrangements for foreign trade missions. Teamwork is a key element of this commercial matching work. The final brokering of deals is done in person or by phone, but the information needed to know what deals are possible is made available with the software. A unified intranet makes it easier to communicate and coordinate information among the 287 offices outside of Washington, D.C. Intranet software has made it possible for staff to improve forecasts of event attendance, for example.

The current intranet was created by "one or two" outside contractors and CS agency people. Many of the programs and ideas for work elements on the intranet came from teams within CS who are able to get management support for their idea. The intranet development process was incremental. Ideas for applications emerged in response to problems in the field. There is only a limited level of support for project development, however, and there are more ideas than resources available. Projects must be readily seen to have value for them to get the needed in-house support. Not all ideas are successfully translated into applications, however. For example, staff wanted an interactive meeting scheduler for coordination among the remote offices, but found they could not do it even with a modest investment in new software.

Software expense is an issue. CS Intranet has acquired a shared document application, and uses instant chat and some large data sets. However, staff did not believe the division could afford desirable B2G software. Additional externally designed software is desired but seen as out of reach. Established government sites such as Employee Express are available from CS Intranet. Some of the material for the intranet also came from the Commerce Department's Internet site.

Seven main programs constitute the basic business processes. Menus for these programs are organized as follows on the site:

- eMenus, including applications to arrange trade events, make contacts, and obtain finance and product management

- Programs to match businesses with investors, arrange trade fairs, identify likely business and trading partners, provide access to market research and commercial news

- Marketing materials, including success stories and best practices, newsletters, and press releases

- Critical databases for market research, performance measures, and the Commercial Service Operations Manual

- Employee search programs

Figure 7: Office of the Secretary, Department of Commerce Intranet Home Page
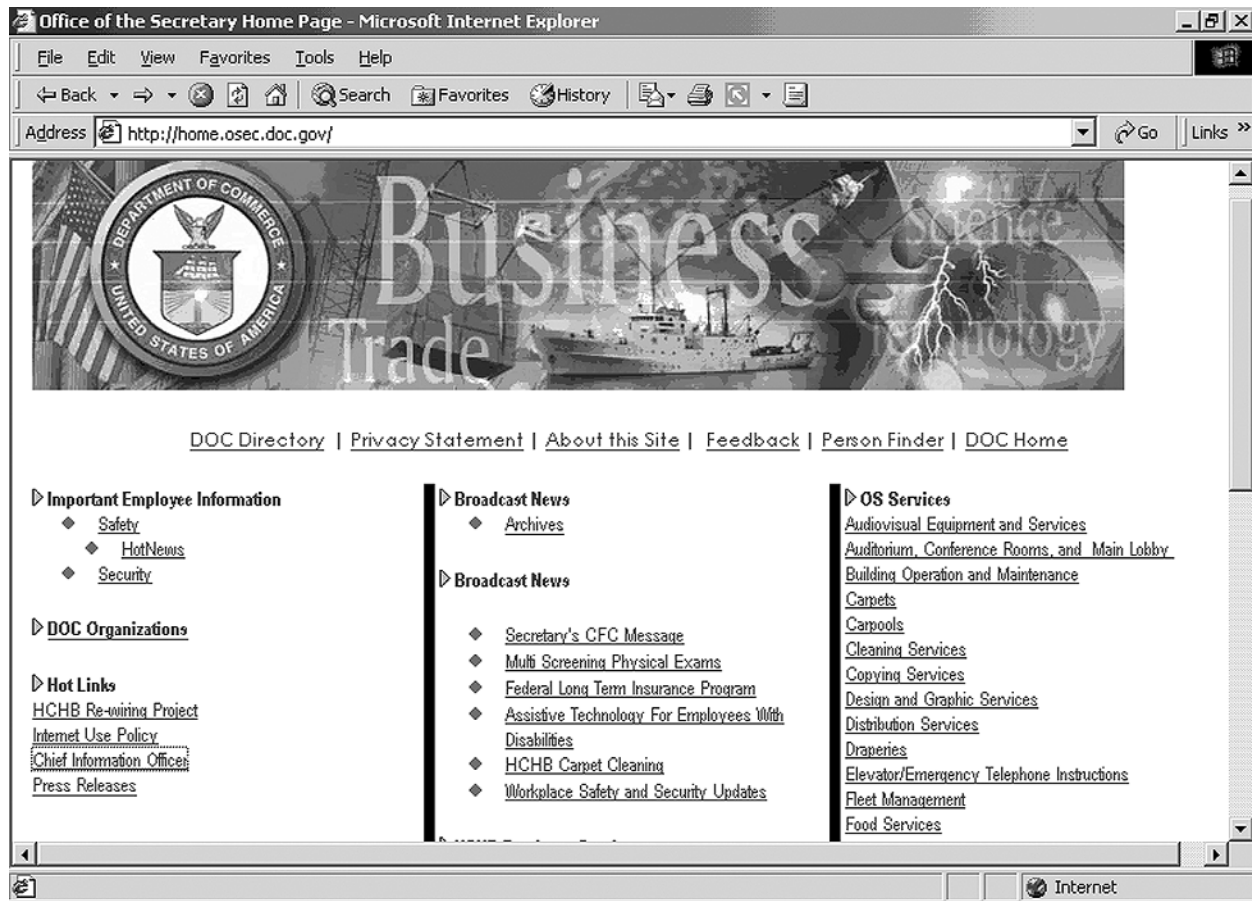
- News

- Personnel, including Employee Express, job announcements, and travel policies

Much of the software in these menus requires training to use. Descriptions of training opportunities, though not the courses themselves, are available online. Interview comments suggest that it has not been easy to get as widespread a use of the applications as desired. As the intranet content has become more valuable to staff, and more important within the organization, its use has increased.

Office of the Secretary, Department of Commerce Intranet. The intranet for the Department of Commerce as a whole was created as part of former Secretary William Daley's effort to quickly establish a digital capacity. He challenged the

department to become a "digital department" in 45 days and built consensus for this with a series of town hall meetings. His vision was to have interactive features on the intranet permitting members to conduct international business, communicate, and make travel arrangements online, for example. Communication was perhaps the largest issue. With 50,000 employees to inform, a wide-reaching communications method was a necessity. In 1999, designers were challenged to come up with a home page to show quick success with e-government in line with the Clinton administration's priorities. Many of the individual program divisions, such as the Bureau of the Census and the Commercial Service, already had their own intranet, some largely based on their Internet websites. The current secretary has not yet focused attention on the department-wide intranet at this point, but staff expect this to happen.

Cultural consolidation of the seven program divisions of Commerce was not a top priority, so this mission for the intranet was not a driving force, as it was for Transportation. As a result, few general purpose applications have emerged. The focus so far has been as a source for important departmental documents, forms, policy statements, and information about building maintenance services and meeting spaces. Interactive features such as travel planning are considerations for the near future. Home access is an objective, and collaborative online work group programs have also been explored, but are not yet features of the intranet. A pilot project testing online collaboration found that face-to-face communication was preferred.

The site functions largely as a portal, but one designed to provide easy access to applications used with outside customers, with less attention placed on employee needs. The present site was created in the Public Affairs Office within the Office of the Secretary. Library staff and web technicians are represented on the design team. For the most part, the intranet site features information links, not interactive functions. The site contains links to a number of services:

- Major offices in the Office of the Secretary

- Department policy statements on administration, civil rights, security

- Department news and documents

- Employee services, including cafeteria information, forms, mail and telephone directories, and travel policy information

- Employee resources including links to Employee Express, the employee handbook, orientation

- Services for building maintenance

Some effort has gone into making staff aware of the site, but marketing has not been aggressive. Those who find the site are reported to like it. A demonstration at a town meeting in 1999 and one in the summer of 2000 introduced the site. Commitment to the site and its maintenance have been issues. Synergy between the intranet and Internet sites for the department is seen as the key to maintaining the site and keeping information up-to-date.

Resources have been a problem, too. The intranet and Internet sites share a technical staff and a common budget, but funds for either are scarce. In general, the intranets within the divisions are viewed as more sophisticated and are apparently better funded and maintained than the umbrella intranet, because they use applications that interact with the public.

Lessons Learned
- With more specialized and sophisticated software come barriers to use and the need for training that can impede the full use of the capacity of intranets.

- Intranets may be created in response to the mandate for digital government as well as in response to a specific need.

- Library-based designers, in contrast to design teams composed of management or technical members, tend to create information resource links rather than group collaboration or interactive applications.

- Cost-conscious agencies can create intranet sites, with minimal use of outside contractors, using incremental changes to existing platforms.

Department of Justice (DOJ)

The intranet at the Department of Justice, DOJnet, was created in 1998 as a spin-off of the formation of the department's Internet site, established earlier. The designers and technical systems staff were originally brought into the organization to determine how to respond to Freedom of Information Act requirements to make agency data available to the public. Another purpose was to serve the Clinger-Cohen Act requiring agencies to make information and services available online. The mandate by the Clinton administration to make a "Kid's" Internet page available at each agency was a third impetus. DOJ respondents believe the federal push has been first for the Internet to link clients and employees. The intranet emerged from the concerns of the department's chief information officer that an umbrella intranet was needed to provide information and better communication to the department as a whole. Some information was being copied and mailed to employees across the 36 components of the department. For example, a recently

added subscription to an online news service linked to the intranet replaced in-house news clipping, copying, and distributing. Other news, administrative, and policy documents were being duplicated in the separate, divisional intranets. Like Commerce and Transportation, the Department of Justice houses a number of agencies with separate identities and their own intranets.

Both the Internet and intranet sites at Justice are maintained and designed by the same staff group, composed of computer technicians and library information resource specialists. As the Internet site was developing, the technicians quickly realized they needed help with content, and the involvement of the library staff in web design evolved from that. The technicians work to maintain the server and write the html code. The intranet content is now a component of the DOJ library, which is developing an information resource management specialty. The library staff design the content of both the Internet and intranet sites including the appearance and the organization of the data. This placement of the web design function is seen to have affected both the library and the design process.

Funding for both the intranet and Internet sites comes from the same budget line. No particular level of resources is allocated to the intranet, and funds are tight. Cuts in the Department of Justice budget are more likely to come out of administrative funds than funds seen to affect crime fighting more directly. Only the first version of the intranet was designed by a contractor. Since then all work has been in-house.

Library staff determined the content of the site based on the types of reference information requests they receive in the library. Ideas for links were based first on the reference sources that employees ask for most often. Librarians also brainstormed about what information might be useful, examined other sites, and gleaned ideas from Intranet Roundtable participants. Other information support staff in personnel, litigation, and management offices were queried about what requests for information they receive most often.

The site is largely non-interactive at present. It offers links to the most recent department policy files and government sites such as Employee

Express. Forms can be printed and mailed, but not filed online. The major categories of services and information sources on the departmental intranet site in October 2001 were:

- News and Events, including today's news clips

- People, Places, and Offices, employee organizations, shuttle bus routes, and commercial directories

- Research Resources, including library links, full-text legal decisions and manuals, asset forfeiture information

- Career Development, including job listings, résumé builder, training opportunities, e-learning

- Your Workplace, with links to ethics laws, EEO complaint forms, office supplies, personnel information

- Your Finances, with links to investments and savings plans, insurance information, payroll information, Employee Express, and retirement calculators

- Health and Welfare, including health benefits, employee assistance program, work life and flextime information, and leave bank

- Technical Information on web development training

- Travel and Weather

Categories as well as contents are much expanded from the previous version.

The next generation of the intranet is to be more interactive, but this will take a major change in architecture and represents a major investment. The information resource staff will depend on the Internet builders in the department for this advance. Overcoming security issues and including electronic signatures will mean that the system will be able to take time and attendance information online, making the site heavily used.

Virtual groups and collaboration are features of intranet work sites within the program divisions, where litigation work, such as briefs, may be shared. Many such work spaces are confidential and password protected. The department also sponsors extranets, cross-divisional work spaces, that

are secure. They are used for work involving inter-departmental jobs such as between Treasury and the IRS. The DOJ-wide intranet itself does not yet have applications for collaborative work.

An example of one type of interagency intranet is the Consolidated Assets Tracking System, CATS. This system is used in five agencies in offices across the country to maintain an up-to-date inventory of assets seized under drug, money laundering, and racketeering statutes. Most offices in the Drug Enforcement Administration (DEA), Federal Bureau of Investigation (FBI), Immigration and Naturalization Service (INS), the U.S. Marshals Service, and the U.S. Attorney's offices have access to a computer dedicated to this system. The system itself is not interactive, but a special interagency e-mail links users. The system connects to the DOJ intranet from the Research Resources page. There has not been funding for marketing the program, and designers estimate that only about half of those eligible to use it know about it. Improve-ments planned include moving from a DOS-based to a Windows-based operating system.

Security issues in the department complicate the creation of an intranet considerably. The FBI and DEA have stand-alone computers not linked to other DOJ sites, including DOJnet. Separate com-puters available in some offices do link into the department-wide intranet, but the transition is awkward and inconvenient. These and other law enforcement divisions do have their own intranets. Because some of the information on the intranet may be sensitive, agency respondents asked us not to reproduce their home page.

Little has been done to explicitly market DOJnet, but its value has been recognized within the department. Its use has snowballed. One of the actions that helped popularize the site was to give it links to personnel functions and personal finance information. Highlights of news and new informa-tion items are also sent out by e-mail, making members aware of what is available at the site. E-mails also announce the existence of an archive of past items and provide a link to the archive on the intranet. At present, the Netscape home page for employees is the DOJ Internet website. DOJ is considering making the department intranet home page the home page for all employees. There is

some reluctance to do this, however, because of the strong identity employees have with the divi-sions and divisional intranets.

Lessons Learned
- Once again we observe that when Internet and intranet sites are funded from the same budget and must share allocations, the Internet seems to get the larger share of funding.

- Funding for intranet and Internet sites, along with other administration-related functions, is more readily cut from tight budgets than other, more directly mission-focused work.

- Cost-conscious agencies must typically rely on in-house solutions and do not necessarily turn to outside consultants.

- Security issues in some agencies create chal-lenging conditions for intranets since sensitive data must be protected from unauthorized access. This has meant stand-alone computers and the absence of linkages among intranets.

Human Resources Applications on Agency Intranets

Since intranet uses for human resources functions are often the most common and well developed of the uses of intranets, the human resources applications in the six agencies were examined in particular detail.

Department of Transportation. The department-wide intranet offers crosscutting human resources functions at the Department of Transportation, while HR procedures that are specific to a division are provided on the divisions' intranets. Most of the HR functions on the DOT-wide intranet are non-interactive, offering a central repository for information about awards, benefits—including long-term care options—job opportunities, and work-life balance. Centralizing this information was seen as offering major savings in time and labor, though the amount has not been quantified.

Department of Housing and Urban Development. In developing an agency-wide intranet at HUD, the assumption was that staff would not access the intranet for things specific to their program, but would want to be able to do things that were general to HUD as an organization, such as human resource information and tasks. The design team asked managers what questions they were asked most often, and generally the responses related to basic information questions that entailed information exchange rather than problem solving issues. A major boost in intranet use occurred when Personnel ceased printing vacancy announcements and posted them only on the intranet. One of four features that appear on each employee's intranet home page is Employee Highlights, including personnel announcements and an employee locator.

Additionally, employees can select to personalize their page with features including handbooks, forms, jobs, and benefits.

Environmental Protection Agency. At EPA, one of three links from the EPA@Work front page is to Headquarters Intranet, with features for making changes in personnel documents, travel information and forms, the customer satisfaction program, contract forms, human resources, and links to information on administrative policies. One function that employees have consistently found valuable and regularly use is the "EPA locator" by which staff can find contact information for other employees and contractors. This function has been prominent on all iterations of EPA@Work. Another function that is popular involves forms and information on travel. Forms can be downloaded and printed, but cannot yet be completed and submitted online.

At EPA, most of the HR functions that are available interactively at this time are made possible through Employee Express and the Thrift Savings Plan (TSP). EPA is in the process of implementing HR Pro, the PeopleSoft enterprise software that is being customized for EPA. When that is in place, employees will have access to their personnel records and employee leave will be managed there. EPA also has an automated Employee Benefits Information System (EBIS) through which employees can receive a synopsis of their leave, TSP account holdings, and health and retirement benefits, either Civil Service Retirement System (CSRS) or Federal Employees Retirement System (FERS) as appropriate. Finally, EPA has an automated job database

available on the public access site called EZHire (www.epa.gov/ezhire/), which will be linked from the intranet.

General Services Administration. InSite, the GSA intranet, includes five major categories of features including travel and human resources. As the intranet became more robust and more of a tool that employees could use, staff gravitated to the site. Basic features such as a telephone directory drew people to the intranet. Currently, there are two HR/financial applications available through InSite. One is FEDdesk, which is an application that handles time and attendance records, travel and miscellaneous reimbursements, and cash awards. Another is Pay and Leave Statements, a payroll application that renders employees' pay records and permits employees to change address and federal and state tax withholding information.

Department of Commerce. The department's intranet provides information to employees on a number of HR-related functions. It operates as a portal for information for employees such as directories, travel policies, occupational safety issues and reports, and information on health, retirement, and other benefits. These informational services, though not interactive, offer major savings in HR employee time and printing costs. Employee Express, the contract payroll service provider, is interactive and makes it possible for employees to make changes in payroll information online. This saves time for HR personnel who would otherwise have to handle these changes. According to the staff we interviewed, the greatest time savings from these intranet services is to the employees. No longer must they spend time trying to find the correct HR specialist to see, since the information is always available online. Such savings are needed because of major reductions in the size of the HR department over the past decade. It is not a matter of transferring HR specialists to new tasks so much as doing more with less.

Department of Justice. At Justice, the organization-wide intranet is also largely non-interactive. Information on health benefits, investments and savings plans, employee assistance programs, and work-life and flextime, as well as the leave bank, are all available from the intranet. As in Commerce, Employee Express allows employees to make changes in their payroll options without the intervention of HR specialists. While more interactive HR functions are desired, such change is expected to be expensive and had not been made six months after we first heard of their plans.

Overall, the respondents readily acknowledged that the HR functions, both the more typical non-interactive ones and the hoped-for interactive developments, are enormous timesavers for HR staff who otherwise spend enormous amounts of time responding to requests for information. Printing costs are also reduced through online provision of notices, rules, and directories. Many HR functions are still performed on an individual basis, however, including benefits changes and choices, as well as evaluations and rewards.

Findings and Recommendations

Findings

We can collate the lessons learned from each of the case studies into five overall observations.

Finding One: In large multi-divisional departments, divisional or regional intranets predate the department-wide intranet and pose challenges for establishing a niche for an umbrella intranet.
In five of the six agencies examined—Transportation, EPA, GSA, Commerce, and Justice—divisional intranets existed prior to the creation of a department-wide intranet. In several agencies, employees in those divisions had become accustomed to using their divisional intranets in their day-to-day operations. This was particularly apparent for the Department of Commerce's Commercial Services Intranet—which has become integral to matching business opportunities and interested investors, the core function of the division—and for the Department of Justice's interagency intranet, the Consolidated Assets Tracking System. In both cases, much of the work of divisions was actually conducted on the intranet.

Not only did these agencies have small task-oriented intranets, but there were also robust divisional intranets. For example, at DOT, each of the 11 operating divisions had a functioning intranet. At EPA, each of the regional offices had intranets of their own. Within the Department of Justice, a number of agencies with separate identities and established functions, such as the FBI and INS, have their own intranets.

In several agencies, individual program or division intranets are regarded as more sophisticated and appear to be better funded and maintained than the agency-wide intranet. Three factors seem to account for this. First, over time these smaller intranets have been adapted to their users' needs and have developed a clientele through repeated experiences. Second, fewer people to appeal to and a more focused functionality have made it easier for these intranets to be responsive to their users. And, third, most of these divisions make a direct contribution to the public, and although the intranets are not accessible to the public, they do support the public service mission of the division.

The successes of divisional and regional intranets pose a challenge to the success of an agency-wide intranet. Within all the agencies examined, there is evidence of the usefulness of an internal, closed website for an organization. But it may be that there is an optimal size for the utility and functionality of an intranet. In most of the agencies examined, the agency-wide intranet was eclipsed by sub-agency (regional and divisional) intranets. In these instances, there was generally a link to the agency-wide intranet for department-level functions and information. But it would appear that most of the work of the department occurs in the smaller units and that the sub-agency intranets are more valuable to staff on a daily basis.

To be successful, a department-wide intranet needs to identify a role for itself that will draw employees. The Department of Transportation attempted to do this with some success. It viewed the department-

wide intranet as a means to foster a common culture within the agency. Similarly, at EPA, the goal for the agency-wide intranet was not to duplicate the divisional and regional intranets but to provide information and functions common to all EPA employees. The Department of Justice is struggling with the same question. At present, the Netscape home page for employees is the DOJ public access website, but there is talk of changing that to the intranet home page. Still, there is some reluctance to do this because of the strong identity employees have with the divisions within Justice and employee links to their divisional intranet.

GSA has also experienced tension between sub-agency intranets and the agency-wide intranet. Within GSA, each service has now created its own intranet, which is used as the default home site for employees in that service. The regional offices have created their own intranets as well. To some extent, these entrepreneurial ventures were encouraged by the GSA intranet team, but the effect has been to relegate GSA InSite to the role of a holding company that is accessed from the other intranets. However, trying to consolidate and impose centralization on a decentralized organization is likely to be impossible given the organizational culture.

Finding Two: Top departmental support for and interest in the agency's intranet is especially critical in the initial planning for and launching of the intranet.
In virtually all of the agencies examined, support from the secretary or deputy secretary level was essential. Without such interest and support, an agency-wide intranet would not have developed. In three of the six organizations, support for a department-wide intranet came directly from the secretary.

- At HUD, both Secretary Cisneros and Secretary Cuomo were proactive in the development of the intranet and found opportunities to broaden its use. Cisneros, who was intrigued with the Clinton administration's vision of the Internet as a superhighway, supported the intranet as a concept and project. When Congress proposed abolishing HUD, Cisneros suggested using the intranet as a tool for communicating with employees. As a result of this initiative, more

staff became accustomed to accessing the intranet. When he became secretary, Cuomo also supported the HUD intranet. On one occasion, after he announced the necessity of a staff cut and suggested that employees consult HUDweb for job announcements, there was so much traffic that the server crashed.

- GSA Administrator David Barram had come from private industry, had a close relationship with AOL, and was surprised at the lack of online activities at GSA. At a GSA information technology meeting in 1996, Barram proposed that he order GSA to offer employees Internet and intranet access within four months, by Flag Day.

- Commerce Secretary Daley challenged the department to become a "digital department" in 45 days and built consensus for this with a series of town hall meetings. His vision was to have interactive features on an agency-wide intranet, permitting members to conduct international business, communicate, and make travel arrangements online, for example. With 50,000 employees to inform, a wide-reaching communications method was a necessity. In 1999, designers were challenged to come up with a home page to show quick success with e-government in line with the administration's priorities.

In two of the case studies—the Departments of Justice and Transportation—support came primarily from the deputy secretary level. In these departments, the genesis for the intranet and staff support for its development came primarily from the chief information officer.

- At the Department of Justice, the intranet emerged from the concerns of the department's CIO that an umbrella intranet was needed to provide information and better communication to the department as a whole. It seemed unnecessary that in the electronic age much agency information was being copied and mailed to employees across the 36 components of the department. The intranet offered a way to more efficiently distribute information. For example, a recently added subscription to an online news service linked to the intranet replaced in-house news clipping, copying, and distributing.

- At the Department of Transportation, the e-government unit within the Office of the Chief Information Officer played the lead role in implementing an agency-wide intranet that would meet the goal of the development of a common DOT culture by generating strong linkages across divisions.

At EPA, the first intranet resulted from the realization that other agencies had developed intranets and that there would be value from an EPA intranet. A team of three, operating from the Office of Information Resources and Management but with support from the top of the agency, developed the prototypes of the intranet and oversaw its initial agency-wide deployment in January 1998.

Finding Three: Marketing of an agency-wide intranet is crucial to encouraging staff use.
Three of the six agencies examined had aggressive, and successful, marketing campaigns to generate staff interest and use. In general, these campaigns involved slogans and meetings, and accompanied the launching of each new iteration of the intranet.

- Marketing of the intranet to EPA employees has been important throughout its developments and deployments. At various points, "Intranet Weeks" were held when the intranet team did a "dog and pony" show to illustrate the benefits and capabilities of the intranet. Although attendance was often low at such events, the intranet team believed their publicity fostered more interest in and use of the intranet. For the launch of the September 2001 iteration, the intranet team designed a "power-up with EPA@Work" campaign using an "Empower Bar" (see Figure 8) theme to convey the idea that employees who are hungry for information can get "vital, up-to-date information" by starting their day with the "new and improved" agency intranet. This campaign involved posters, flyers, and bookmarks with the same slogans and images.

- At HUD, the intranet was viewed as a management tool to improve communication: "Work smarter, not harder, without paper." The slogan "smart HUD employees work online" was designed to encourage employees to use the intranet. In 1998, HUD made a concerted effort

Figure 8: EPA@Work EmpowerBar
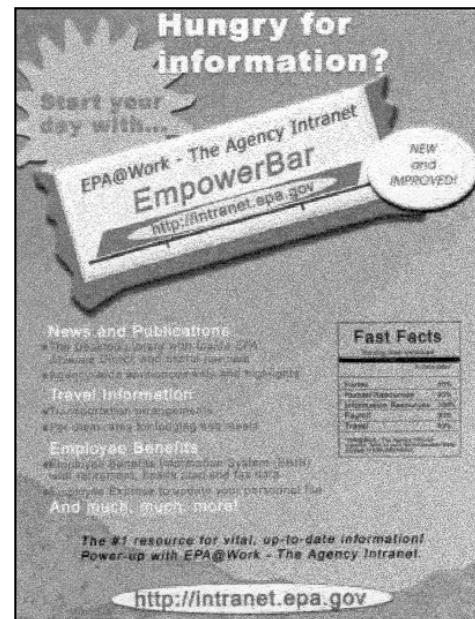
to differentiate its public access Internet site and its intranet for employees. A "Web Awareness Day" was held in Washington and in the regional offices to launch a "two websites ➔ one hud" to highlight the message that the intranet was a "tool, not a toy." As a result of this campaign, there was a doubling of intranet hits in six months, and that level was sustained for the next several years. Some problems with differentiating HUD's intranet and public access website continued, and in 2000 a contest was held to rename the intranet. The winning name was hud@work. Again, slogans were utilized to catch employees' attention. "If it's green, it can't be seen" reminded employees that the primary color on HUD's intranet was green while its website color was red. Once more in 2001, when HUD added customization features to the intranet, this was advertised as "HUD's Next Generation Intranet."

- The GSA administrator named the agency's intranet "InSite." The Office of Communications marketed the rollout of the intranet on Flag Day 1996 and planned the official announcement. The rollout highlighted GSA's desire to have a valuable site for its employees. It also emphasized the practical aspects of how to browse the intranet and the "do's and don'ts" of using it.

Three departments—Transportation, Commerce, and Justice—have made more modest attempts at marketing their intranet sites. For example, the Department of Commerce introduced its intranet with a town meeting in 1999 and a demonstration in the summer of 2000. But in all cases, as employees become aware of the real value of the intranets, use increases.

Finding Four: Within federal agencies, more attention and energy is devoted to the agency's public access website than to its intranet.

This is not remarkable given legislative and public support for online Government to Citizen interactions, the federal government's commitment to digital government, and the number of Internet champions both inside and outside the federal establishment. Despite this focus on the Internet, all agencies are experimenting with transferring Internet technology and software, as well as the knowledge gained from developing and deploying Internet websites, to an internal agency intranet.

In most of the agencies examined, Internet and intranet staff and resources were shared. This was true in the Departments of Transportation, Justice, and Commerce. HUD has a separate staff dedicated to the intranet. Despite this, the intranet is still considered the Internet's "baby sister" and the Internet website is regarded as the primary electronic work site. At EPA, the intranet team members, all of whom had some computer and technical background but were basically interested in information applications, were separate from the Internet team. The EPA intranet did not have a separate budget; instead, funding came from the Internet budget.

Finding Five: In all the organizations examined, the development of the intranet has been an iterative process and is still very much evolving.

Agency personnel responsible for intranets are constantly evaluating how well their intranet is meeting the needs of employees and are looking for ways to improve it. None consider their intranet a finished product but instead see it as a work in progress. All agencies have had several iterations of their intranet.

- HUD has had five iterations of its intranet beginning in November 1996. The first four were entitled "HUDweb" and were referred to as "HUD's Internal Information Network." From 1996 to 2000, HUDweb was modified on a yearly basis, with the goal of simplifying the intranet and making it more useful to employees. A major rethinking and revision of the site occurred in 2001 with the unveiling of a customizable intranet renamed "hud@work."

- EPA's intranet was first available agency-wide in January 1998. Its latest iteration was launched in September 2001 and utilizes a new tasks and topics "portal" design by which EPA employees can quickly access agency processes and areas of interest by subject.

- The development of the Commercial Services Intranet within the Department of Commerce followed an incremental development process. Ideas for applications emerged in response to problems in the field.

- The Department of Justice's intranet is largely non-interactive at present. It offers links to the most recent department policy files and government sites such as Employee Express. Forms can be printed and mailed, but not filed online. The next-generation intranet is expected to be more interactive, but this will require a major change in architecture and a significant investment.

As part of this iterative process, chat rooms have been popular at particular times in a limited number of agencies. The use of chat rooms has been more episodic and hard to sustain for a long period of time.

- Within HUD, the chat feature on the intranet was used extensively by employees during the budgetary crisis under Secretary Cuomo. Both he and the deputy secretary encouraged the use of the chat room and participated in discussions about how best to manage changes associated with the financial problems. But as the budgetary crisis passed, use of the chat rooms diminished.

- At GSA, the bulletin board area of the intranet, named "My 2 Cents," was a popular feature and brought employees to the intranet. This began as an anonymous, open bulletin board for the posting of questions and answers, but problems arose as comments digressed and

some users failed to understand "netiquette." The GSA administrator intervened by monitoring the bulletin board, responding to comments, and offering cash awards for suggestions. He also encouraged other top executives within GSA to participate, but some managers were reluctant to reply by name.

Customization or personalization of intranets has also been a feature of the evolutionary development of intranets in a few agencies. This iteration generally occurs late in the process of development after employees have become accustomed to using the intranet and are seeking more innovation.

- DOT added a personalization feature for its intranet home page in its current iteration. Employees can now create their own version of the standard home page elements; establish links to online employee groups or communities, a weather site, an online dictionary, Google, and other features; and include their personal calendar.

- HUD's intranet added a personalization feature in 2001 with its hud@work iteration. In focus groups for the planning of hud@work, employees had requested such a feature.

Development of collaborative or shared work areas on intranets is another feature that has evolved in several organizations and is being planned in others. This has been more successful in some agencies than others.

- The DOT intranet offers the capacity to create and join interest-based virtual communities. This feature is one that employees value and use.

- HUD's current (2001) intranet includes virtual team technology that could be used for collaborative work through real-time chat, teleconferencing, and file exchange. Although managers favor the idea, they have been reluctant to use it.

- The EPA intranet offers work groups, chat rooms, and collaboration through its license for Lotus Notes and Lotus Notes Mail. These more interactive functions have not yet been used widely in the agency because of training requirements, firewalls, and costs. The intranet team recently had a demonstration of the PeopleSoft portal, which would allow customiza-

tion and more collaboration and flexibility; this may be the next iteration of EPA@Work.

- At this time, there is no collaborative work space on GSA's intranet, but there are some pilots under way. Other methods of knowledge sharing, such as Lotus Notes and Quick Place, are also being investigated.

- The Department of Commerce has explored the possibility of collaborative online work group programs, but they are not yet features of the intranet. A pilot project testing online collaboration found that face-to-face communication was preferred.

- At the Department of Justice, virtual groups and collaboration are features of intranet work sites within the program divisions, where litigation work such as briefs may be shared. These work spaces tend to be confidential and password protected. The agency-wide intranet does not yet have applications for collaborative work.

Recommendations

Our research offers a snapshot of intranet evolution as seen in the second half of 2001. The intranets we examined and those throughout the federal government are continuing to develop to better meet the needs of management and employees. Based on the analysis of the case studies, we offer three recommendations for enhancing intranet development in federal agencies.

Recommendation One: A department-wide intranet requires a department-wide effort to be successful.

This recommendation encompasses three elements:

- *Upper management support is required.*

  If management wants employees to use the intranet, it must actively encourage employees to avail themselves of the options on the intranet. Managers should champion the intranet in their communications to employees. Their support should not be passive but active. Managers should be models to employees by using the intranet themselves. Manager support should be continual, not just at the point of the introduction of the intranet and subsequent iterations. For use of the intranet to be sus-

tained, managers need to foster a behavioral change among employees.

Finally, managers should make administrative decisions that require employees to use the intranet. For example, managers can discontinue paper copies of telephone directories and job announcements, the contents of which change frequently and can be easily updated online. Similarly, rules and regulations can be searched more easily in electronic form, making online versions more useful than paper copies.

- *Involvement of employees is essential.*

  To win employee support, employees need to be part of the decision-making process for designing the intranet. A top-down approach will not succeed. Rather, employees should be consulted about their work routines, their suggestions about how the intranet can make them more effective and efficient in their jobs, and their "wish lists" for additional features. In many of the agencies we examined, the intranet design teams held focus groups with employees and found such venues valuable sources of input.

- *Technical staff should not lead but must be active participants.*

  The development of an agency's intranet should not be directed by technical staff, but rather should be led by administrative staff and program managers. This helps to ensure that decisions are made based on what employees are likely to want and what functions are important to the agency as a whole. If decisions are driven by what is technically possible or innovative, then employees will need to readjust their work habits to suit the new technology. To be utilized and functional to the agency and staff, intranet technology should accommodate the needs and conventions of the employees and the organization. Moreover, if the technology drives intranet development, that development will be constrained by what is technically possible at that time. If management and staff needs drive development, new technical features may be created. Managers can challenge technical people to find appropriate solutions that may not be available with current technologies.

Recommendation Two: The more real value the intranet provides, the more employees will use it. In all the agencies examined, as the intranet became more robust and more of a tool that employees could use, they gravitated to it. If the intranet offers useful services, employees will come to it. Functionality is key to success. Basic features such as a telephone directory or personnel notices draw people to the intranet. If employees can easily find there the information they use routinely in their jobs, then they will use the intranet. Once employees become accustomed to accessing it as part of their everyday routine, they will also begin to use more enhanced features on the intranet, such as collaborative work places. Sophisticated intranet software that requires training is less likely to be used by employees.

Recommendation Three: As intranets become more personalized and are used more for collaborative work, organizations will need to address issues of workplace surveillance and monitoring. The organizations we examined are all in the early stages of designing personalized features into their intranets and using the intranet for collaborative work. As they offer these features, agencies encounter both enthusiasm and reluctance. The enthusiasm seems to result from the desire to be a part of a highly functional online environment. There appears to be a realization that there is great untapped promise from an intranet. At the same time, employees seem to recognize that if their online work spaces are personalized and if they participate in online collaboration, they will leave behind an electronic trail that managers can monitor and evaluate.

Thus, managers need to be proactive in explaining what substantive and transactional information will be captured as a result of intranet use, who will have access to that information, for what purposes the information will be used, and how long information will be retained. Managers should adopt policies that reflect the collection of the minimum amount of intranet information, should limit access to and retention of that information, and should restrict use of it. Moreover, employees should have the right to access any substantive and transactional information on the intranet, as well as the ability to redress any grievances that result from that information.

Appendix:
Agency Personnel Interviewed

Environmental Protection Agency (EPA)
Pournima Soman
Computer Specialist
Information Services Branch
1200 Pennsylvania Ave., NW
Mail Code 2843 T
Washington, DC 20460
(202) 566-0693
fax: (202) 566-0685
e-mail: soman.pournima@epa.gov

Michael J. Weaver
Computer Specialist
Office of Environmental Information
Information Access and Analysis
1200 Pennsylvania Ave., NW
Mail Code 2843 T
Washington, DC 20460
(202) 566-0695
fax: (202) 566-0685
e-mail: weaver.mike@epa.gov

General Services Administration
Christopher F. Fornecker
Chief Technology Officer
U.S. General Services Administration
1800 F Street, NW
Room 3024
Washington, DC 20405
(202) 219-3393
fax: (202) 219-1249
e-mail: christopher.fornecker@gsa.gov

Dean T. Klein
Managing Director for Information
Office of the Chief Financial Officer
U.S. General Services Administration
1800 F St., NW
Room 2122
Washington, DC 20405
(202) 501-0329
fax: (202) 501-3310
e-mail: dean.klein@gsa.gov

Sally J. Perry
Division Director, Infrastructure Applications
U.S. General Services Administration
1800 F Street, NW
Room 1211
Washington, DC 20405
(202) 501-2871
e-mail: sally.perry@gsa.gov

Department of Commerce
Allan Betts
E-Business Development Counselor
U.S. Commercial Service
U.S. Department of Commerce
14th and Constitution Ave., NW
Washington, DC 20230
(202) 482-0287
e-mail: Al.Betts@mail.doc.gov

Karen F. Hogan
Deputy Chief Information Officer
U.S. Department of Commerce
1401 Constitution Ave., NW
Washington, DC 20230
(202) 482-2607
fax: (202) 501-1180
e-mail: khogan@doc.gov

Department of Housing and Urban Development

Candis Harrison
Departmental Web Manager for Field Operations
U.S. Department of Housing and Urban
Development
HUD Tucson Office
160 North Stone Ave., Suite 100
Tucson, AZ 85701-1467
(520) 670-6237
fax: (520) 670-6207
e-mail: Candis_B._Harrison@hud.gov

Department of Justice

Susan L. Bronston
Manger/User Communications
Department of Justice
901 E Street, NW, Suite 101
Washington, DC 20530
(202) 616-1899
fax: (202) 616-0696
e-mail: sbronston@base2tech.com

Department of Transportation

Crystal M. Bush
DOT Intranet Manager
Office of the Chief Information Officer
U.S. Department of Transportation
Room 6100-J, NASSIF Building
400 Seventh Street, SW
Washington, DC 20590-0001
(202) 366-9713
fax: (202) 366-7024
e-mail: crystal.bush@ost.dot.gov

Phyllis Preston
Associate Chief Information Officer
for E-Government
Office of the Secretary
U.S. Department of Transportation
400 Seventh Street, SW
Room 6432
Washington, DC 20590
(202) 493-0216
fax: (202) 366-7373
e-mail: phyllis.preston@ost.dot.gov

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A B O U T   T H E   A U T H O R S

Julianne G. Mahler is Associate Professor of Government and Politics in the Department of Public and International Affairs at George Mason University. She has worked extensively in the area of organization theory and public management, conducting research on organization culture in several federal government agencies. Her most recent research is on agency learning and the evolution of policy technologies.

Dr. Mahler has published numerous articles on decision making, measuring customer satisfaction, and organization culture and learning. She is co-author of *Organization Theory: A Public Perspective* with Hal Gortner and Jeanne Nicholson. She currently directs the master's program in political science at George Mason University. Her B.A. in political science is from Macalester College and her M.A. and Ph.D. are from the State University of New York at Buffalo.

Priscilla M. Regan is an Associate Professor in the Department of Public and International Affairs at George Mason University. Prior to joining that faculty in 1989, she was a senior analyst in the Congressional Office of Technology Assessment (1984-1989) and an Assistant Professor of Politics and Government at the University of Puget Sound (1979-1984). Since the mid-1970s, Dr. Regan's primary research interest has been the analysis of the social, policy, and legal implications of organizational use of new information and communications technologies.

Dr. Regan has published over 20 articles or book chapters, as well as *Legislating Privacy: Technology, Social Values, and Public Policy* (University of North Carolina Press, 1995). As a recognized researcher in this area, she has testified before Congress and participated in meetings held by the Department of Commerce, Federal Trade Commission, Social Security Administration, and Census Bureau. Dr. Regan received her Ph.D. in government from Cornell University in 1981 and her B.A. from Mount Holyoke College in 1972.

KEY CONTACT INFORMATION

To contact the authors:

Julianne G. Mahler
Associate Professor
George Mason University
Department of Public and International Affairs
Fairfax, VA 22030
(703) 993-1414

e-mail: jmahler@gmu.edu

Priscilla M. Regan
Associate Professor
George Mason University
Department of Public and International Affairs
Fairfax, VA 22030
(703) 993-1419

e-mail: pregan@gmu.edu

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For additional information, contact:

Mark A. Abramson
Executive Director
The PricewaterhouseCoopers Endowment for The Business of Government
1616 North Fort Myer Drive
Arlington, VA 22209
(703) 741-1077, fax: (703) 741-1076

e-mail: endowment@us.pwcglobal.com
website: endowment.pwcglobal.com

The PricewaterhouseCoopers Endowment for

The Business of Government

1616 North Fort Myer Drive
Arlington, VA 22209-3195