

The Information Professional's Role in Creating Business Management Systems

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“Although the core of the profession remains the same, the methods and tools for information delivery and the scope of the enterprise continue to grow and change dramatically. While maintaining their client and content-centered approach, practitioners increasingly require advanced knowledge of information technology to realize their full potential. Continually emerging opportunities will propel the prepared professional into as yet unseen realms of advanced information retrieval, interpretation, synthesis, product development and virtual services on a global scale.” (Abels et al. 2003)

INTRODUCTION

In the new millennium, the ability to unify information and processes has caused a paradigm shift in information management, fueling an explosion in the business marketplace. Data formerly being collected and managed within the confines of an MIS department now resides within Web-based management systems where end-users and nontechnical managers can access, create, modify, and implement data-collection efforts directly.

For years, information professionals (IP) have created Web-based systems to collect, organize, and distribute information. The skills of the IP are transferable to a broad spectrum of new endeavors that unify people, content, processes and systems. The paradigm shift has impacted the role of the IP by providing the opportunity to employ the intellectual and technical skills previously used in creating information systems to build web-based business management systems.

This paper presents historical and current perspectives of the IP's role and follows with a case study that illustrates the use of IP competencies in building business management systems. Design and development core processes, including team roles, are delineated. The IP's knowledge and skills used in developing a Web-based business management portal for the California Department of Health Services, Bureau of Local and Statewide Programs, Tobacco Control Section (TCS) are described. Also featured is how the portal facilitates the client's ability to harness the distributed knowledge of their partners and put that knowledge to work in coordinated, systematic ways. The paper describes ways the portal has increased efficiency and productivity.

HOW THE WEB CHANGED EVERYTHING

When the World Wide Web made its debut, it changed the landscape of business processes and operations. Prior to the Web, the traditional role of the Management Information Systems (MIS) professional was to collect, store and output data for internal consumption. The traditional role of the IP working in an information center (IC) was to identify, collect, organize, synthesize, re-package and distribute information for both internal and external consumption. The two roles seldom overlapped in mission or responsibilities. Generally, neither department had a central interface to access data and information but instead data existed in separate silos without an enterprise search capability. The Web allowed the merger of business management and information management thereby integrating systems and providing end-users with easy access to personal and shared information.

The traditional mission of an MIS department was technology oriented to support business endeavors. An MIS mission generally included the following:

- Supporting the goals of the organization
- Collecting and storing large structured data sets
- Building and maintaining reliable and secure systems
- Providing data reports for internal customers to support decision-making needs
- Providing selective access to information (easily anticipated, well-defined reports)

Generally MIS departments were responsible for collecting and storing large sets of structured data used in business processes. Some typical MIS functions included data system planning, design, and security; and information technology infrastructure management. The types of business processes supported might have included the following: inventory control,

financial, production, and marketing. Reporting needs tended to be straightforward and unchanging.

Prior to the mid 1990s, ICs traditionally focused on information resources and services to support the end-user. The end product was geared to the individual consumer rather than a business process. The IC mission reflected the organization's strategic goals and objectives and generally included the following:

- Providing information resources and services to meet the demands and needs of stakeholders
- Purchasing, acquiring, and providing access to materials and resources
- Educating stakeholders, as needed, on proper use of materials and information systems
- Collecting, preserving, storing, and cataloging materials
- Working in collaboration, with the Information Technology department, to provide database services

Typically an IC was responsible for collecting and storing both structured and unstructured information to support decision making and the acquisition of knowledge. Reporting needs were customized to the specifications of the end-user on demand. Some typical IC functions included developing specialized collections of resources (both physical and digital), providing manual and on-line reference services, and developing information products such as resource guides, directories, best practices manuals, research digests, information analysis services, and information alert services.

Paradigm Shift

Just as the personal computer revolutionized the way we live and, more importantly, the way we do business, the same can be said of the Web. As the hypertext transfer protocol emerged, browser applications were created. Through Web browsers, end-users could view data stored in various proprietary applications without having those applications on their computers. For the first time, end-users had easy access to real-time business and global information in multiple formats. Conversely, organizations had unprecedented access to the end-users who could help them create and manage information.

Web applications provided the ability to access, acquire, create, revise, retrieve, and deliver data in real time via a Web browser—and at anytime from anyplace. The Web provided more powerful tools for information access and acquisition, searching, management, and delivery. It also provided access to pervasive information in multiple formats not previously accessible in more traditional on-line systems (Dialog, LexisNexis). Via Web search engines, end-users could mine voluminous resources residing on thousands of computers around the world using one simple query.

Universal access to the Web and its applications (e-mail, browsers, search engines, Web publishing, content management, etc.) gave organizations the ability to create business

management systems that could integrate previously isolated information and processes. Silos of information and processes could be linked transparently.

This brave new world shifted the focus of MIS professionals from the collection and maintenance of data in proprietary applications and systems to the end-user and their information needs. For IPs, the change brought about the removal of technical barriers, allowing IPs to bring their strong information management and end-user orientation to the data collection and distribution process at a more fundamental level. The IP role shifted from navigating the rooms someone else built to helping design a floor plan that better supports the ultimate purpose and goals of the residents (end-users).

Changing Roles

From the MIS perspective, the importance and priority of the end-user has increased dramatically. Gauche (1997) says “The changes taking place in organizations today create in line management demands for information that are not met by the old paradigms.” He goes on to say “The new paradigm demands that we answer more difficult questions like ‘What information does the user need,’ ‘How does he assimilate that information,’ and ‘How is the information recalled at the moment it can add value to the business process?’” The Web environment altered the MIS perspective from accumulation, storage, and retrieval of information to applying information based on the needs of the end user (Gauche, 1997).

From the IP perspective, the explosion of information and the interconnectedness of systems and processes increased the demand for the skills needed to manage information effectively and provided IPs the opportunity to transfer existing skills to new domains. Their experience in anticipating and assessing end-user needs and behaviors has placed them in a strategic position to play a key role in the design and development of business management systems.

CASE STUDY—OTIS

The Florida State University (FSU), Center for Information, Training, and Evaluation Services (CITES) functions as an applied research and public service arm of the University. As part of FSU’s research mission, our staff of information managers and Web application engineers is committed to using current applied research and remaining at the vanguard of the information industry.

FSU/CITES, under contract with the TCS, developed the California Online Tobacco Control System (OTIS) business management portal to provide real-time, user-centered information.

A portal is a Web site that provides a uniform interface with the ability to use a secure username/password to access customizable content based on specific end-user interests and needs. A business management system incorporates and integrates all the components needed by

an organization to complete critical tasks and meet and accomplish its business objectives. The components may include financial, planning, reporting, customer service, marketing, and resource management. A business management portal integrates business systems with information-communication systems such as announcements, directories, and calendars.

The development of a business management portal for TCS stemmed from the need to more efficiently manage contracts with 61 local health departments and more than 100 competitive grants for providing tobacco use prevention/cessation activities and services locally and statewide. A unified, fully interactive Web-based system was required to efficiently manage the submission, approval, and progress/cost reporting of the various tobacco control plans in a cost-effective manner. The ability to produce aggregate reports of all project information to be used as a management tool by the TCS was also needed. The TCS staff identified the following benefits of such a system:

- Create a less burdensome mechanism for agencies/organizations to respond to requests for proposals.
- Improve the quality of submitted plans by creating a system that would guide the end-user in making the correct selection/entry based on previous selections.
- Streamline the approval process.
- Manage contracts more efficiently.
- Increase accountability (internally and externally).
- Coordinate tobacco control efforts.
- Identify programmatic gaps.
- Improve statewide evaluation of local program efforts.

Design and Development Core Processes

Designing and developing a successful business management system requires a team comprised of individuals with subject matter expertise, end-users, and information management and technology experts. Too often systems are not successful because, in the design and development stage, the end-user was a secondary team member or there was a heavier focus on the business processes instead of end-users. “Even the best designed information systems are not used if they are not aligned with the system users’ motivations and commitment.” (Malhotra and Galleta 2004)

The design and development of business management systems generally include the following core processes: information discovery and analysis, design, creative layout, prototype, development, quality assurance, beta-testing, revisions, implementation, training, and evaluation. The core processes are defined as follows:

Figure 1: Design and Development Core Processes

| Core Process | Description |
|------------------------------------|--|
| Information Discovery and Analysis | Identifying and analyzing current information sources (databases, publications, forms, etc.) and business processes. Determining additional information needs and business requirements. |
| Design | Translating the information collected during information discovery and analysis into system requirements that include the following: <ul style="list-style-type: none"> • End-user Roles • Business Rules • Content Requirements • Content Management Strategy • Form Design • Web Flow Design • Reporting Requirements • Data Structure |
| Creative Layout | Designing a visual mock-up of key pages to reflect the look and feel of the system as well as its functionality and content. |
| Prototype | Developing a Web site that emulates the design, flow, content, and functionality of the intended end product. Incorporating continuous client feedback based on initial design specifications. |
| Development | Creating databases, Web pages, code, scripts, and other components based on the approved prototype. |
| Quality Assurance | Reviewing content for adherence to visual style and editorial standardization guidelines. Reviewing functionality of appropriate tools to ensure that data is accessible and the system is functioning appropriately. Performing usability testing. |
| Beta-Testing | Testing the developed system for functionality and usability by the system manager and designated end-users. |
| Revisions | Making modifications based on the feedback from beta-testers. |
| Implementation | Transitioning the system from a development environment to a live production environment ready for general end-user access. |
| Training | Teaching end-users how to most effectively navigate and use the system and developing handbooks or manuals, as needed. |
| Evaluation | Collecting feedback from the community of end-users related to usability, functionality, and content. |

Development Team Roles

Based on previous experience in Web-based system development, FSU/CITES was awarded the contract to design and develop a business management system for TCS. As part of the management strategy, TCS was designated to provide subject matter expertise and was required to provide a team that would be available to meet with the FSU/CITES team on a frequent and regular basis. The TCS project manager was responsible for assembling a team of appropriate stakeholders and designated end-users. During the discovery, analysis, and prototyping processes, these teams met at least once a week; during development and implementation, meetings were held generally twice a month.

The following table (Figure 2) provides a description of the project roles and responsibilities of team members.

Figure 2: OTIS Development Team Roles

| Roles | Responsibilities |
|--|--|
| Project Director* | Oversees all operational aspects of the project and the timely accomplishment of the project deliverables. |
| Project Manager* | Handles the day-to-day management, planning, scheduling, and reporting of the project. Communicates with the TCS project manager on a regular basis to assess needs and expectations. |
| Web Application Engineering Coordinator* | Meets with clients to assess business goals/requirements for Web applications; performs systems analysis; designs, creates, manages and documents change control process for any development efforts; designs, develops and implements the system. |
| Web Application Engineer* | Creates and manages databases based on the system design schematic. Develops needed code for the Web interface, including all back-end code, and provides help desk support to end-users. |
| Quality Assurance Coordinator* | Reviews content for adherence to visual style and editorial standardization guidelines. Reviews functionality of appropriate tools to ensure that data is accessible and the system is functioning appropriately. Conducts usability testing. |
| Information Systems Librarian* | Analyzes data for collection and organization. Develops content management strategies including taxonomy control and controlled vocabulary development. Documents data structure and business rules. |
| Visual Designer | Creates the graphic images and visual style design for all Web pages within the system. |
| Network Administrator | Designs, administers, and oversees security of the network environment, including hardware, systems software, applications software, and all computer-related configurations. |
| TCS Project Manager | Provides subject matter expertise on all facets of the business operations processes. Coordinates teams of key stakeholders, communicating and soliciting feedback on decisions made about |

| | |
|----------|--|
| | the design, development, and implementation of the business management system. |
| End-user | Provides input and feedback about processes, usability, and functionality of the system. |

*Designates FSU/CITES staff with either an MLS or MLIS

The following table (Figure 3) illustrates the roles of OTIS team members in each of the core processes.

Figure 3: Core Processes by Role

| Core Processes | Roles | | | | | | | | | |
|------------------------------------|------------------|-----------------|---|--------------------------|-----------------|-------------------------------|-------------------------------|-----------------------|---------------------|----------|
| | Project Director | Project Manager | Web Application Engineering Coordinator | Web Application Engineer | Visual Designer | Quality Assurance Coordinator | Information Systems Librarian | Network Administrator | TCS Project Manager | End-user |
| Information Discovery and Analysis | • | • | • | • | | | • | | • | • |
| Design | • | • | • | • | | • | • | • | • | • |
| Creative Layout | • | • | • | | • | | | | • | • |
| Prototype | • | • | • | • | | • | • | | • | • |
| Development | | | • | • | | | | | | |
| Quality Assurance | • | • | | | | • | | | | |
| Beta-Testing | | | | | | | | | • | • |
| Revisions | • | • | • | • | | • | • | | | |
| Implementation | | • | • | • | | | | • | | |
| Training | • | • | • | • | | | | | | |
| Evaluation | | | | | | | | | • | • |

Using the core processes, FSU/CITES was able to provide TCS with a state-of-the-art business management portal that is flexible and scalable, and integrates 21 systems and supports 12 user roles. The OTIS portal provides end-users one-stop access to all information and business processes related to tobacco procurements.

The portal provides hundreds of users a single interface for accessing what were previously 12 disparate systems into several related silos, thus eliminating redundancy in information collection and management. The portal also provides the user personal tools i.e., calendar, tasks. Most importantly, the portal provides a shared system that gives its end-users

real-time access to their own information and to other stakeholders' contacts, objectives, activities, materials, evaluators, and events. Before OTIS, the paper system did not facilitate aggregate reporting. Thanks to OTIS, for the first time, TCS could generate aggregate reports that allowed timely strategic program planning and improvement. OTIS also accelerated and simplified the procurement application and approval process.

The following table (Figure 4) provides a summary of the OTIS portal.

Figure 4: OTIS Business Management Portal Summary

| Overview | Systems |
|--|---|
| <p>21 systems 244 database tables 200 forms 392 end-users 12 system roles 60 reports</p> | <p>Planning, Collaboration, and Communication Systems</p> <ul style="list-style-type: none"> • Calendar (Personal and Global) • Task Management (Personal and County) • Contact Directory • Project Directory (OTIS/TCS Sites) • Evaluator Registry/Directory (OTIS/TCS Sites) • Help System • Materials Development and TECC Intake • Announcements (Multitype) • Communication (Threaded) <p>Procurement Systems/User Roles</p> <ul style="list-style-type: none"> • Plan/Application Submission (Applicant, Subcontractor) • Review and Scoring (Internal and External) (Peer, TCS) • Plan/Application Approval (PC, CM, TAC, Supervisor) • Plan Revisions (Applicant) • Augmentations (Renewal) (Applicant, PC, CM) • Progress Report Submission (Applicant) • Progress Report Approval (PC) • Cost/Invoice Report Submission (Applicant) • Cost/Invoice Report Approval (CM) • Procurement Management (PM) • TCS System Administration (SysAdmin) • Contract Management (CM, PC, TCS, Applicant, Supervisor, CMU) |
| End-user Roles | |
| <ul style="list-style-type: none"> • Applicant • Subcontractor • Program Consultant (PC) • Contract Manager (CM) • Technical Assistance Consultant (TAC) • Supervisor • Tobacco Control Section (TCS) • System Administrator (SysAdmin) • Procurement Manager (PM) • Peer Reviewer (PR) • Evaluator • Contract Management Unit (CMU) | |

The following is a list of major advantages in managing a statewide initiative with a Web-based business management portal:

- Allows for the collection of uniform information.
- Promotes standardized data-collection methodology.
- Allows easier data entry and plan development.
- Facilitates timely feedback and approval.

- Improves coordination, collaboration, and accountability.
- Combines multiple forms into one online system.
- Streamlines and tracks plan/reporting approval process.
- Generates useable reports of individual and aggregate data.
- Identifies contractor training needs.
- Improves the ability to analyze program effectiveness.

Harnessing the Distributed Knowledge of Stakeholders

OTIS is an example of using technology to harness the distributed knowledge of stakeholders in an integrated, systematic way. It presents the end-user with consolidated and enhanced information customized to their needs. With IPs' long history of using cutting edge technology to harness, consolidate, and package information for the needs of the end-user, IPs bring an essential perspective to building effective business management systems.

OTIS provides the client with the ability to integrate several processes via systems that are connected in the portal. These include the following planning, collaboration, and communication tools:

Figure 5: OTIS Systems and Features that Support Shared Knowledge

| Systems | Features | Shared Knowledge |
|------------------------------|---|--|
| Calendar | Personal and shared | Access to national, state, regional, and local event information |
| Task Management | Personal and shared task assignment; status indicator | Access to tasks that are personal and shared within an agency |
| Contact Directory | Master directory of agency contacts integrated with all other systems throughout portal that uses contact information | Access to contacts within an agency |
| Project Directory | Uniform search interface | Access to all facets of funded project information |
| Contract Management | Procurement and contract data tracking | Access by role to pertinent and real-time contract data and status |
| Evaluator Registry/Directory | Allows individual to register as potential evaluator; allows project applicants to select registered evaluators | Access to registered evaluators and their qualifications |

Applied IP Competencies

“An Information Professional (‘IP’) strategically uses information in his/her job to advance the mission of the organization. The IP accomplishes this through the development, deployment, and management of information resources and services. The IP harnesses technology as a critical tool to accomplish goals. IPs include, but are not limited to librarians, knowledge managers, chief information officers, web developers, information brokers, and consultants.” (Abels et al. 2003)

Figure 6 lists IP competencies published by the Special Libraries Association and examples of how the competencies were applied in creating the OTIS portal.

Figure 6: SLA IP Competencies and OTIS Case Study Examples

| SLA IP Competencies (Abels et al. 2003) | OTIS Case Study Examples |
|---|--|
| Assesses, selects, and applies current and emerging information tools and creates information access and delivery solutions. | Assessed and selected software platform. Created customized application. Used software and hardware solutions to create a business management system for TCS. |
| Applies expertise in databases, indexing, metadata, and information analysis and synthesis to improve information retrieval and use in the organization. | Examined content life-cycle of TCS paper-based system and translated it into a Web-based system. Designed and provided content management solutions to maximize information retrieval. |
| Manages the full life cycle of information from its creation or acquisition through its destruction. This includes organizing, categorizing, cataloguing, classifying, disseminating; creating and managing taxonomies, intranet and extranet content, thesauri, etc. | Provided TCS with a system to efficiently manage the life cycle of procurements including creation, implementation, application, review, funding, reporting, and termination. Improved the quality and reporting of data through standardization. |
| Builds a dynamic collection of information resources based on a deep understanding of clients’ information needs and their learning, work and/or business processes. | Conducted an information discovery and analysis. Integrated disparate systems into a unified, centralized system accessible through a uniform interface customized based on end-user role. |
| Demonstrates expert knowledge of the content and format of information resources, including the | Developed a user-friendly interface for navigating, searching and filtering complex |

| SLA IP Competencies (Abels et al. 2003) | OTIS Case Study Examples |
|---|---|
| ability to critically evaluate, select, and filter them. | data sets and generating reports. |
| Provides access to the best available externally published and internally created information resources and deploys content throughout the organization using a suite of information access tools. | Created unified systems that allow for content creation, management, and filtering (calendar, tasks, announcements, etc.). |
| Negotiates the purchase and licensing of needed information products and services. | Purchased required hardware and software for system development, implementation, and maintenance (development and live servers, Web development and server software, collaboration tools). |
| Develops information policies for the organization regarding externally published and internally created information resources and advises on the implementation of these policies. | Helped client evaluate and revise information rules and policies and advised on implementation. |
| Develops and maintains a portfolio of cost-effective, client-valued information services that are aligned with the strategic directions of the organization and client groups. | N/A (For this project, all content is produced, maintained, and published internally.). |
| Conducts market research of the information behaviors and problems of current and potential client groups to identify concepts for new or enhanced information solutions for these groups. Transforms these concepts into customized information products and services. | <p>Conducted survey of stakeholders to assess technical needs and capabilities and developed system technical standards based on results.</p> <p>Created a system for continuous feedback from stakeholders during design, development, and implementation of the system.</p> |
| Researches, analyzes, and synthesizes information into accurate answers or actionable information for clients, and ensures that clients have the tools or capabilities to immediately apply these. | <p>Created a system that allows for obtaining real-time accurate answers and actionable information by viewing aggregate data.</p> <p>Assessed data integrity and use based on knowledge of information usability and recommended data strategies.</p> |
| Protects the information privacy of clients and maintains awareness of, and responses to, new challenges to privacy. | <p>Provided secure network.</p> <p>Designed secure system that ensures the privacy of data based on end-user roles.</p> |
| Maintains current awareness of emerging technologies that may not be currently relevant but may become relevant tools of future information resources, services, or applications. | Proposed next generation solution that would incorporate OTIS as a portlet within an enterprise portal. |

CONCLUSION

This paper described the paradigm shift created by the advent of the Web and how it has allowed IPs to apply their knowledge and skills in new arenas. The case study demonstrated the IP roles in the creation of a business management portal that streamlined and standardized day-to-day business practices for the client.

IPs stand on the brink of new and emerging opportunities. By applying traditional skills and embracing leading edge technologies, IPs are uniquely qualified to create and fulfill strategic roles to provide innovative information solutions.

BIBLIOGRAPHY

- Abels, Eileen, R. Jones, J. Latham, D. Magnoni, and J. G. Marshall. 2003. *Competencies for Information Professionals of the 21st Century*, <http://www.sla.org/content/learn/comp2003/index.cfm> (accessed March 25, 2005).
- Gauche, Jerry N. "From Media to Markets: A New Paradigm for Information Management." *ARMA Records Management Quarterly. Prairie Village* 31, no. 4 (1997): 3–8.
- LexisNexis. Information Professional Web Survey (2003), <http://www.lexisnexis.com/about/whitepaper/InfoProWebSurvey.pdf> (accessed March 25, 2005).
- Malhotra, Yogesh and D. F. Galletta. "Building Systems That Users Want to Use." *Communications of the ACM* 47, no. 12 (December 2004): 89–94.
- Musher, R. "The Changing Role of the Information Professional [New England Online Users' Group Survey]. *Online* 25, no. 5 (September/October 2001): 62–64.
- Tyson, Lisa. "Library Systems Teams—More Than Just Peripherals." *Library Hi Tech* 21, no. 3 (2003): 317–324.
- U.S. Department of Labor, Bureau of Labor Statistics "Computer and Information Systems Managers." *Occupational Outlook Handbook (2004–2005)*, <http://www.bls.gov/oco/ocos258.htm> (accessed March 25, 2005).
- U.S. Department of Labor, Bureau of Labor Statistics "Librarians." *Occupational Outlook Handbook (2004–2005)*, <http://www.bls.gov/oco/ocos068.htm> (accessed March 25, 2005).
- White, Colin. "Building the Smart Business: Connecting People, Processes, and Information" (2004), http://portalslibrary.portalscommunity.com/detail/RES/1099676409_383.html?src=mu_p_j2c (accessed March 25, 2005).