on the evolution of the IS function and the CIO's job. Chapter 3 looks at strategic uses of IT in a global economy. Chapter 4 provides a comprehensive review of information system planning techniques and methods and suggests how they could be effectively used in guiding the organization through the various stages of technological and business evolution.

- Part II (Chapters 5 through 8) discusses the management of the essential information technologies (the left side of Figure 1-6). The chapters address, in turn, the distributed systems architecture that now dominates computing, building and managing telecommunications, managing corporate information resources, and managing day-to-day partnership-based IT operations.
- Part III contains three chapters that deal with developing and delivering systems, primarily procedure-based systems. Chapter 9 describes the evolution of system development, tools and approaches, the trend toward system integration, and the growth of Internet-based development. Chapter 10 covers important issues in managing system development and delivery. We address specific issues to effectively manage legacy systems. Chapter 11 provides an overview of information security. We suggests methods to identify areas of potential threats and discuss possible solutions.
- Part IV consists of three chapters that discuss different types of systems that support knowledge work. Chapter 12 looks at using IT to support decision making and business intelligence. Chapter 13 discusses systems that support collaborative work. We cover a wide spectrum of techniques ranging from workflow technologies and crisis management. Chapter 14 shows how IT can support knowledge work in a society that increasingly relies on social networking.
- Part V, the final chapter of the book, looks to the future. We propose of number of proven principles to help managers move ahead in the networked economy.

To illustrate how one IS organization has evolved over the years, following is the case of MeadWestvaco. The story begins with the first edition of this book, in 1985. The evolution of the case study to the present eighth edition mirrors the changes that have taken place in many IS organizations over the past 20 years.

## CASE EXAMPLE

# MEADWESTVACO CORPORATION

**www.meadwestvaco.com**

MeadWestvaco, with headquarters in Stamford, Connecticut, is a $7-billion global company that produces specialty and coated paper, packages specialty chemicals, and manufactures consumer and office products. It owns and manages some 3 million acres of forest using sustainable forestry practices. The company operates in more than 29 countries, has about 24,000 employees around the world, and serves customers in approximately 100 nations.

Mead Corporation and Westvaco, two comparably sized forest products companies, merged in early 2002 to form MeadWestvaco Corporation. This case study begins in 1985 and follows the evolution of Mead's IT function up to the present time, in its merged form. In 2001, *InformationWeek* magazine listed Mead No. 193 in its top 500 of the most innovative users of information technology. The IT organization has remained in Dayton, Ohio, the former headquarters of Mead Corporation.

### The 1960s and 1970s: Reorganization of Information Services

In the 1960s, Mead's corporate information services (CIS) department provided all divisions with data processing services. By 1967, the department's budget had grown so large that management decided to spin off some of the functions to the divisions. Divisions could establish their own data processing and process engineering groups or they could continue to purchase data-processing services from CIS. Many of the divisions did establish their own IS departments, but all continued to use the corporate data center for their corporate applications. In the late 1970s, the CIS department had six groups. The director reported to the vice president of operations services. The six groups under the director were:

- *Computer Operations* to manage the corporate data center
- *Telecommunications* to design the telecommunications network and establish standards
- *Technical Services* to provide and maintain systems software
- *Developmental Systems* to handle traditional system development
- *Operational Systems* to maintain systems after they become operational
- *Operations Research* to perform management science analysis

### The 1980s: Focus on End-User Computing

In 1980, management realized that its CIS organizational structure would not serve the needs of the rapidly growing end-user community. Furthermore, to become an "electronic-based" organization, Mead needed a corporate-wide network. Therefore, the department reorganized so that the director of corporate information resources (CIR) reported directly to the company president. This change signaled the increased importance of information resources to Mead.

CIR was responsible for creating hardware, software, and communication standards for the entire corporation; it ran the corporate data center; and it operated the network. All the divisions used the network and corporate data center, and they followed the corporate standards; some operated their own small, distributed systems as well, which linked into the corporate network. The three departments within the new group were as follows.

***Information Resources Planning and Control*** was responsible for planning future information systems and technology. This department grew out of the company's strong planning culture. The decentralization in the 1970s highlighted the need for a coordinating IT body. Although it was small, it had two important roles. First, it took the corporate perspective for IT planning to ensure that Mead's IT plans meshed with its business plans. Second, it acted

(*Case Continued*)

as planning coordinator, helping various groups and divisions coordinate their plans with corporate and CIR plans.

***Information Services*** was responsible for most of the traditional IS functions from the old information services department—company-wide telecommunications support, data center operations, development of corporate-wide systems, database administration, system software support, and technical support for end-user computing.

Most divisions developed their own applications, following the guidelines created by this department. The IS steering committee—composed of the president and group vice presidents—established a policy that applications should be transportable among the various computing centers and accessible from any Mead terminal. The company's telecommunications network established the guidelines for making this interconnection possible.

***Decision Support Applications (DSA)*** provided all end-user computing support for the company. At the time of the reorganization, DSA had no users, no products, no common applications among multiple locations, and only five staff members in operations research and two in office systems support. By 1985, they were serving 1,500 users in some 30 Mead locations with 10 staff members. DSA offered 14 products and 8 corporate-wide applications through the following 4 groups:

- *Interactive help center* provided hotline support and evaluated new end-user computing products.
- *Office systems* supported the dedicated word-processing systems and IBM's Professional Office System (PROFS), which Mead used as the gateway to end-user computing. Divisions were free to select any office system, but most followed the recommendations of this group to ensure corporate-wide interconnection.
- *Decision analysis* built a number of company-wide decision support systems, such as a corporate budgeting model and a graphics software system. It also used operations research tools to develop linear programming models and simulations for users needing such sophisticated analysis tools.
- *Financial modeling coordination and EIS* was in charge of Mead's integrated financial system. It also supported executive computing through IBM PCs used by corporate executives and an executive information system (EIS) accessed through PROFS.

**Late 1980s: Structure Adjustment**

The 1980 reorganization separated the more people-oriented activities under DSA from the more technical activities under the information services department. The technology was better managed, and relations with users improved. However, this split caused two problems. The first was that traditional programmers and systems analysts felt that DSA received all the new and exciting development work. The second problem was coordinating the two departments. A matrix arrangement evolved to handle both problems, with both information

*(Case Continued)*

services and DSA people staffing most projects.

The departmental structure implemented in 1980 remained essentially intact throughout the 1980s with only two major changes. In early 1988, the vice president of information resources began reporting to Mead's chairman and CEO. Second, the DSA group was reorganized.

As users became more sophisticated and less generic, the department created small groups with expertise in specific areas. By the end of the 1980s, they were supporting more than 5,000 users in three ways:

- The *service center* continued to introduce new users to technology and provide telephone hotline assistance to experienced users.
- The *application development consultants* helped users develop more sophisticated applications and guided maintenance of user-written applications, which had become a noticeable problem. They also updated traditional applications to permit end-user systems to access the data.
- The *local area experts* worked in the functional departments supporting users in their area. They reported directly to their area manager and indirectly to CIR. Due to the growing number of user-written applications, they, too, helped users keep their applications up to date.

During the 1980s, Mead found its end-user computing focus shifting from introducing new technology to making more effective use of the technology in place. By the end of the decade, Mead was concentrating on harvesting its investment in IT by using it as a lever to change the way it was doing business.

### 1990: Leverage the IT Infrastructure

In 1990, CIR underwent another reorganization to bring it in line with a new strategy. We first discuss the reorganization, then the strategy.

Management realized that the end-user systems and large-scale business systems needed to cross-pollinate each other. Users needed one place to go for help; therefore, application development was placed in one group, which was renamed information services.

The emphasis of the reorganization was to strengthen Mead's mainframe-based infrastructure that the corporate-wide network depended on. Although the network had been created in 1983, its value in connecting Mead to vendors and customers had not been recognized until the late 1980s. Therefore, in 1990, CIR created a new group—network services—to handle computer operations, technical services, and telecommunications. The 1990 reorganization also consolidated administrative functions (such as charge-back) into the technology planning and control group.

Although the 1990 reorganization did not add any new functions, it shifted emphasis from end-user computing to building an infrastructure and integrating development of all sizes of applications.

***1990 Strategy*** In the early 1980s, Mead installed its first information resources business plan, which emphasized networking and end-user computing. By the late

(*Case Continued*)

1980s, the objectives had been accomplished. In hindsight, management realized the 1980 plan had been a technology plan, not a business plan, because its goal had been to get control of IT. Having accomplished this goal, Mead decided to create a true business plan, one that addressed its employing IT resources.

Using the two-by-two matrix management realized that Mead had only been building systems that fit into the lower-right quadrant—systems to support traditional products and internal business processes. Rather than focus on company operations, management decided to shift emphasis in two directions: (1) toward reengineering company operations and (2) toward using IT to work better with suppliers and customers.

Business process reengineering—that is, significantly restructuring the internal operations in a business—became a major strategic direction, with the company-wide network playing a key role. Because IT removes many time and distance barriers associated with business processes, Mead decided to use IT to build new processes rather than simply accelerate existing ones.

One of the major processes carved out to be recentralized and reengineered was purchasing. The reengineering group discovered, for example, that 240 people handled accounts payable, mainly reconciling mismatches between goods received and purchase orders. By reengineering purchasing, the need for such reconciliations was eliminated. Mead outsourced the function while developing the new purchasing system.

Putting in the corporate purchasing system was Mead's first big venture into reengineering. The company learned a lot from that experience. It also accomplished something few others had achieved: standard part numbers for all 800,000 MRO (maintenance, repair, and operations) parts. This excruciating data-cleansing exercise was done so that Mead could automatically consolidate parts orders from all 10 divisions and reap larger discounts due to the higher volumes. The result was large savings.

The second emphasis involved doing business electronically by extending current business processes and products to suppliers and customers. The motto was: "It is easy to do business with us," meaning that customers could specify the transaction format they wished to use, from electronic data interchange (EDI) for application-to-application transactions across company boundaries to terminals at customer sites linked to Mead's computers to the telephone using voice response. In essence, Mead installed various front-ends on its mainframe applications. For the purchasing system, Mead went to major parts suppliers and required them to use EDI as a condition of selling to Mead. The system was fully automatic. If a part was in stock, it was supplied; if not, an order was generated.

Thus, the basic strategy set forth in 1980 remained in force in 1990—to retain central control of the IT infrastructure and distribute responsibility for building and maintaining applications in the operating divisions. As the uses of IT changed, CIR reorganized to focus on those new uses: end-user computing in the 1980s and business reengineering and customer-oriented systems in 1990.

*(Case Continued)*

**The 2000s: Technology Integration and Creation of a Global, Process-Based, Business-Driven Organization**

In 1993, CIR management recognized that client-server computing was a paradigm shift in computing. In their new vision, applications would be of three types: enterprise-wide, division, and local; and they would use a global network that reached out beyond Mead.

CIR continued to focus on shared services (providing the infrastructure and supporting enterprise applications), whereas divisions would tailor systems to their customers and business. Users would not need to worry about where processing occurred, where data was housed, or how the mechanics of information processing were handled; CIR would handle all of these details. Data were to be viewed as a resource and managed accordingly, balancing access with integrity and security. Users would have greater geographic independence than in the past.

This vision is based on a demanding partnership in which the divisions buy into the infrastructure and its standards while CIR provides a flexible and responsive infrastructure.

***New Organizational Structure*** Mead sought to absorb the new client-server paradigm into CIR's organizational structure. The core was the technology layer of the CIR organization—the four core technologies that provided the IT infrastructure on which Mead operated. Data Services provided data and information. Server Technology Services handled all servers on the network, from mainframes on down. Client Services handled all devices that customers touched, which included desktop workstations, fax machines, and telephones. CIR defined their customers as Mead employees as well as others who interfaced with Mead. Network Services handled everything that tied these other pieces together, both voice and data communications, as well as the Internet, intranet, gateways, firewalls, and interactions with their ISP.

On the outside layer of the organization chart, closer to the customer, were the application groups. Division Support supported the applications developed by Mead's 10 operating divisions. Reengineering Support was concerned with a few company-wide business processes that had been recentralized and reengineered to improve efficiency and lower costs. These processes included Mead's financial systems and purchasing system, which did not touch customers. Enterprise Tools and Applications provided a common desktop toolkit to all Mead staff, which consisted of hardware and a suite of software products, such as spreadsheet, e-mail, word processing, graphics, browser, EDI, and knowledge tools (such as Lotus Notes). Corporate Center Solutions handled application development and maintenance of corporate applications. Technical Standards and Planning was a one-person thinktank devoted to future scenarios, whereas everyone else worked on the day-to-day issues. Finally, CIR Administration, shown beneath the circle, handled contracting and financials.

Like other companies, Mead encountered the typical staff problems of getting the mainframe staff to move into the client-server environment and getting new client-server talent to follow the

(*Case Continued*)

discipline needed to develop enterprise-wide systems.

The Internet had a large impact on Vision 2000 in that more and more of the vision was being served by it. For example, the vision foresaw storing lots of data on servers, so that CIR, not users, could handle backup. However, with so much information on the Internet, CIR did not need to acquire, install, or maintain as much public information as was originally planned. For instance, CIR had planned to install the U.S. telephone directory on a CD-ROM server. After it became available on the Internet, CIR simply added an icon to the standard desktop for quick access to the directory.

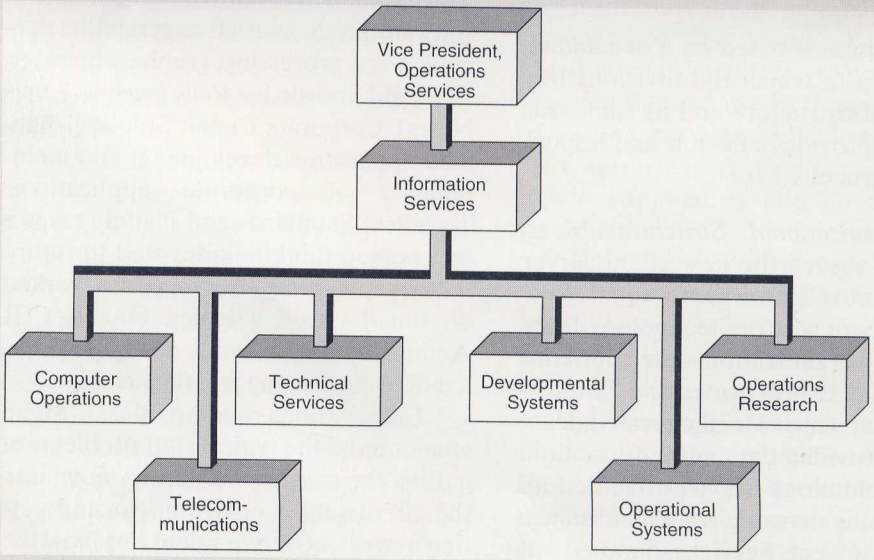
Mead learned that client-server computing was not cheaper than mainframe computing, as was touted in the early 1990s. In 1993, Mead placed the cost of a PC at $9,024 a year ($2,517 hard costs, $6,507 soft costs). With the new standards, Mead believed the soft costs had been cut to $3,005 a year.

The vision was conceived in 1993, implementation began at the end of 1994, and by 2000, right on schedule, the company rolled out 8,000 workstations. During that time, only one change was made to the organization structure: adding Vision Support Services to handle operations (Figure 1-7).

### Into the 2000s: Leverage Centralization

By 2003, Mead would have spent $124 million dollars on the endeavor. The first division went live in late 1999, the second in 2000, and so on. Thus, from the 1960s to 2000, Mead's Information Resources

FIGURE 1-7 Mead Corporation's Pre-1980 Information Services Department




*Source:* Courtesy of the Mead Corporation.

(*Case Continued*)

division would have moved from significant decentralization to significant centralization of systems.

***Implementing ERP*** In the early 1990s, Mead looked at SAP, the leading ERP system, but decided that the software was not appropriate for the forest products industry. In 1995, Mead looked again, and although the software was better, management felt the company did not have the necessary companywide standards, so it declined to move forward on ERP again.

In 1997, though, management forced the issue. The company had increasingly been using a shared-services vision, where functions were taken out of divisions and centralized, making them best-of-breed. Logistics, purchasing, finance, and information resources were provided via shared services. This collaboration left the divisions with the customer-facing work. Management saw a train wreck coming once the first division wanted to install an ERP system. The company would then have to decide, "Do we want to be good at satisfying customers or have good shared services?" Management decided, "We have to do both." To do so, they had to put in the same ERP system companywide to leverage back-end shared services and be number one in customer satisfaction.

Mead spent 1998 determining the design of the enterprise-wide system and began implementation in the first division in 1999. From the reengineering work on the purchasing system in the 1990s, Mead learned that significant company change required business leadership, thus the SAP effort was led by a business executive, and 70 of the 100 team members also came from the business; only 30 came from CIR. In addition, some 80 IBM consultants were involved. Mead chose IBM as its SAP implementation partner because IBM had helped Monsanto implement SAP and had created the IBM/Monsanto Solution Center. Mead was able to draw on that center and Monsanto's experience and even reuse 80 percent of Monsanto's business design, down to the general ledger, giving Mead a running start. ERP implementations are huge and expensive, and many have failed. Mead avoided those pitfalls by learning from others.

Mead used the entire suite of SAP modules except human resources, which was handled by PeopleSoft; it was installed in the mid-1990s and has worked well. Mead was one of the first to install a recent module, Advanced Optimization Planning (AOP), which handles all planning and scheduling. SAP was originally designed to support build-to-inventory manufacturing, which is 60 percent of Mead's business. AOP is for the other 40 percent, which is build-to-order manufacturing.

Lotus Notes, a sophisticated database/executive information system from IBM, was invaluable in providing the building blocks for defining the new ways of working under SAP. SAP required Mead to define 800 roles and describe the workflows and security flows among these roles. This task was not handled by SAP, so Mead used Lotus Notes for it and other SAP support work.

SAP unified the company, but it is a large and complex system. In addition, it requires strict adherence to its rules, which is its downside. A division can no longer tailor its own systems to meet its market's changing needs; in some instances, changes can be accommodated easily, but for major changes it must get concurrence from the

(*Case Continued*)

other seven divisions to change SAP. This could make Mead less nimble; it remains to be seen.

As SAP was turned on, old systems were turned off. In fact, SAP replaced the last generation of systems Mead built itself. Now, all software work is integrating packages, or systems integration. Nothing is coded from scratch. Once SAP was implemented, the development work done by the divisions went away through natural attrition. However, each division has an executive information officer, who mentors the division and coaches it on how to use IT. They focus on reengineering to leverage SAP. They are businesspeople with IT exposure and IT people with business exposure.

***E-Commerce*** The greatest effect of the new implementation has been internal. Mead's intranet has become the way the company conducts its business processes. The homepage is employees' gateway to most of what they need to do at Mead. SAP is browser based.

Mead would have preferred to implement e-commerce on SAP because e-commerce exposes all of a company's legacy-system inefficiencies. However, the company could not wait until 2003, and because its legacy systems still functioned in 2000, it put browser-based front ends on its legacy systems. Once SAP was in place, only the system interfaces needed to change.

In some sense, Mead sees B2B e-commerce as old wine in new bottles. In 1986, Mead built a cluster terminal system for its paper business. The system was proprietary; it ran on Mead's network, and Mead gave proprietary terminals to customers to order paper. Even though the terminals were only character based, with no graphics, customers could see Mead's stock levels, delivery times, and prices. One-third of its business came through this system. In 2000, the system became Internet based. All a customer needed was a browser to log into Mead's extranet to place orders.

However, Mead discovered that although it broke down its own internal silos in installing SAP, it encountered silos in customers' operations. True end-to-end e-commerce will not occur until these partners improve their internal operations.

***Peering into the Future in 2000: Merger and IT Alignment*** In 2000, Mead's industry, like most others, was experiencing unprecedented global competition. To survive, a company needed to become larger or become a niche player. Mead expected to be one of the survivors, and management saw SAP aiding in achieving that goal. If, for example, Mead acquired another company, it would be able to merge operations within 90 days because of SAP. That capability made SAP a valuable acquisition tool.

"The CIO job has definitely changed since 1985," says Langenbahn. "In the 1990s, we always talked about IT being strategic, but it was really a wish. In 2000, it is reality. The role of the CIO has become more strategic and the role has grown, but at the end of the day, information technology is inherently valueless. Value is created by business change and true business change cannot be led by the IT side; it must spring from the business side. The major role of the CIO is to bridge the gap between the business and technology, and to have the enabling technology in place to deliver what the business requires, although the business might not as yet realize what it requires."

(*Case Continued*)

To be a leader in this fragmented market, Mead had to grow. One route would be to grow internally, but with too much capacity already in the market, this option made little sense. A second route would be to acquire companies and consolidate. Management declined this option because of its unfavorable economics, saying, "You always overpay when you buy another company." The third choice was to merge with a competitor of comparable size. That was the route chosen; Mead and Westvaco combined their assets without taking on any debt in 2002.

John Langenbahn saw the merger through and then retired, turning over the CIO job to Jim McGrane. Langenbahn wanted to ensure that it was viewed as a business investment, not an IT investment. Therefore, the project lead, McGrane, worked for the business executive who chaired the SAP steering committee. Both McGrane and Langenbahn were on that committee. Their goal was to create a process-centered IT organization, because with the implementation of SAP and its focus on processes, CIR's new role would be working on business process design enabled by IT. CIR was renamed Enterprise Information Solutions (EIS) to reflect its scope and its mission: process solutions, rather than systems.

***Evolving to a New Process-Centered Structure*** Balancing centralization (and standardization) with local autonomy caused an age-old tension. McGrane dealt with this tension through a "strategic conversation between the corporation and EIS" to decide how MeadWestvaco would address it. The issue was governance: Who would be making which decisions? "Restructuring EIS is very akin to what the framers of the U.S. Constitution struggled with," noted McGrane, "instituting a federal government while preserving states' rights. IT has moved from a mysterious, technical backroom activity into the mainstream, so we now need to hold this business-EIS conversation to do the same."

As an interim step, McGrane put in place the outlines of a new EIS organizational structure, one that would facilitate the creation of a process-based, business-driven organization. He viewed the former Vision 2000 structure as taking a techno-centered view of the world—with a workstation in the center, surrounded by services, and then an application layer. The new structure took a process view.

The interim organization, as shown in Figure 1-8, included:

- *Planning and Administration*, which included an information standards and policy quarterback
- *Technical Services*, which was in charge of application design and staging processes
- *Chief Technology Officer*, who was in charge of architecture
- *Operations*, which was in charge of the deployment process
- *Manufacturing Solutions*, which built and maintained mill and manufacturing support systems
- *Business Solutions*, which included ERP, emerging solutions, and other business systems. Members of this group also handled sunrise/sunset systems, which means they were in charge of managing down ("sunsetting") legacy systems as SAP was implemented in plants and replaced those systems and explored emerging ("sunrising") technologies.

(*Case Continued*)

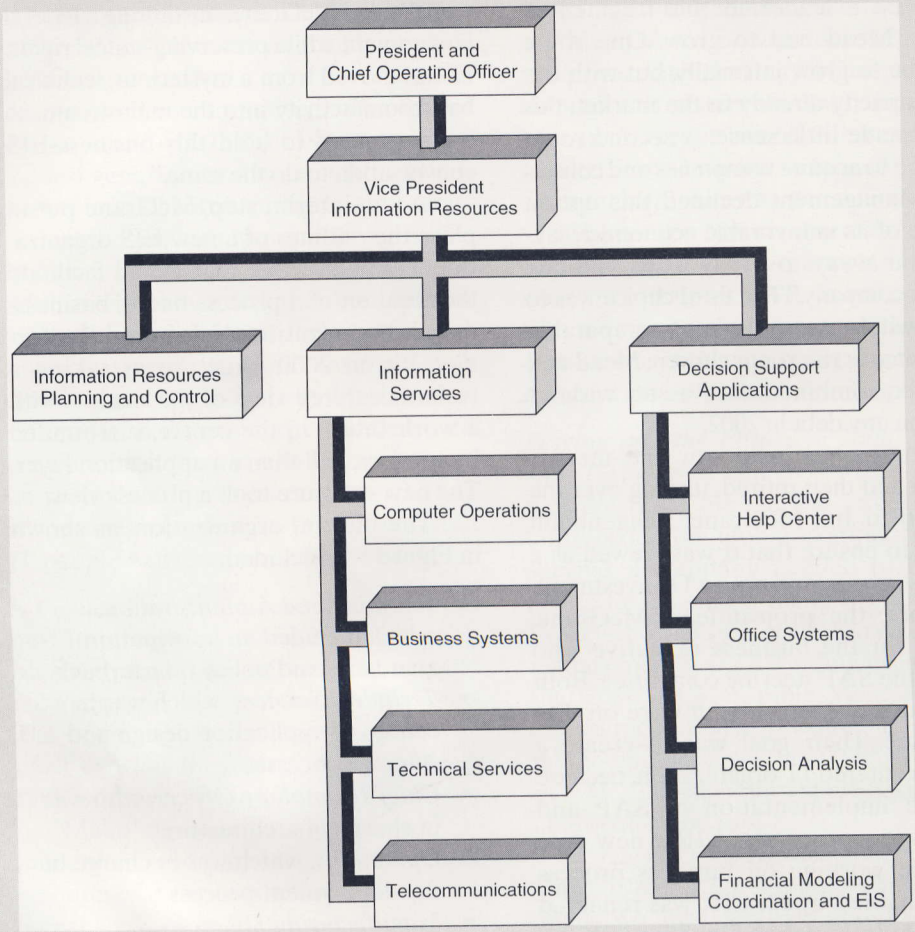



FIGURE 1-8 Mead Corporation's 1980 Information Services Department

*Source:* Courtesy of Mead Corporation.

McGrane's goal was eventually to evolve EIS along three major areas of focus:

1. *Business Processes and Applications* so that EIS was viewed as a business enabler
2. *Infrastructure* so that by designing and developing the right kind of infrastructure, business processes could be automated using advanced software applications
3. *Administration* to ensure return on investments, end-user education and support, asset management, information security, and business continuity, to name just a few

(*Case Continued*)

Within these three areas, a series of processes needed to be defined. For example, one administrative process was security. Creating this process started with defining it, stating policies and procedures (that is, what was to be protected), and then creating tasks to ensure execution. Today, people who do security work reside in different functions throughout the company. The question McGrane asked was, "Do we organize them around a security process or use a matrix, with a security quarterback?" The business goal was end-to-end security and protection of vital information. To achieve that, the company had to move from viewing security as an activity to viewing it as a process. This was the organizational challenge.

This three-area focus had actually been in use since preplanning for the merger. The integration teams were organized around these three areas. Each team's objectives were to find synergies and adopt standards. Adopting Mead's SAP model, for example, shaved millions of dollars off future expenses.

During the first four months following the merger, the new EIS team closed down Westvaco's data center and migrated the systems to Dayton. Desktops, networks, and e-mail systems were migrated to one standard each. In integrating the two IS organizations, EIS saved additional millions of dollars and freed resources to focus on more strategic investments.

***Creating a Governance Structure*** A major issue was investment. How could the company ensure that the EIS portfolio was aligned with the business strategy? And how could EIS engage the business units in constructive conversations about what to do next? How would the company decide between, say, an investment in infrastructure and an investment in a Web-based application? Should they be measured the same way? What should the measurements be?

Based on research outside the organization, McGrane estimated that perhaps only 50 percent of an IT organization's investments were aligned with the business's goals because there have been few mechanisms for holding conversations with the business. MeadWestvaco knew it could not afford that level of misalignment. Now that EIS spending was more than 3 percent of sales (rather than 0.5 percent in the 1970s) and embodied how the business operated (such as how orders were filled), business-IT conversations had to become the norm. From the mechanisms used to hold these conversations, EIS's organizational structure would emerge.

Thus, EIS experimented with some governance structures. To govern overall IT investments, for example, an executive steering committee was formed. It consisted of the executive vice presidents of the business units, the CFO, CIO, and head of manufacturing research and development. These seven executives meet monthly to review and approve new investments and resolve conflicts. MeadWestvaco moved toward an IT investment portfolio with four "buckets":

1. ***Infrastructure:*** Value is measured by total cost of ownership (TCO) benchmarked against the world.
2. ***Utility applications:*** These included payroll, compliance software, and such; value is measured by benchmarked TCO.
3. ***Business applications:*** Value is measured by return on investment (ROI). The total cost of the

(*Case Continued*)

application will be made visible. Thus, if it requires modifying or expanding the infrastructure, that cost will be made visible.

4. ***Emerging and experimental applications:*** No expectations are made of these investments, which deal with technologies that might transform the business but have associated technology risks. ERP was experimental in 1995; reverse auctions and Web applications were experimental in 2002. This category is no more than 5 to 10 percent of EIS's budget.

***Extending Standardization*** Administration of most of the development resources was centralized. Formerly, business units managed their own IT developers. "We are finding that as we engage in conversations that make total cost visible, and we provide alternatives that deliver equal value at lower cost, we have arrived at a point where the business units are willing to give centralization of development a *try," says McGrane. SAP has actually* driven this move; its development was centralized and its configuration is centrally controlled. As SAP replaces the legacy systems, the business units' need for local developers has gone away. EIS extended that central model to Web technology; most development was central.

To balance the tension between centralization and local needs, EIS worked with business leadership to create governing councils, which include business leaders. These councils "own" specific processes and direct the technology enhancements required to improve those processes. The benefit of these councils, notes McGrane, is that once a council approves an enhancement, that enhancement happens across the corporation at one time. Thus, an improvement in plant maintenance occurs at all the plants; the businesses decide the priorities, and they occur company-wide.

Implementing ERP drove MeadWestvaco to leverage resources to solve problems as a joint entity. The company came to see that a problem for one is generally a problem for all. Thus, central design is leveraged. The result is that a business unit that wants to make a change needs to have conversations with the others, and those conversations revolve around what is good for the whole.

"The answer might not be reached as quickly, but it is a more effective answer," states McGrane. "Our business does not change at Web speed. So needing to make a decision quickly is often a red-herring argument. Standardization has forced real business discussions to occur. And it is forcing our business leaders to become more technology literate, and those of us in EIS to become more literate about the business issues we are trying to solve. That's all for the good." *McGrane was elected vice president* in 2002.

### 2004: Creating the Process-Based, Business-Driven EIS Organization

In mid-2004, McGrane was two years into his five-year plan to turn EIS into a process-based and business-driven organization. "It's a bit tougher than I expected," he admits. According to McGrane:

> *It's essentially reengineering the organization from being functionally oriented to being process oriented. We are moving from managing work to managing outcomes.*
>
> *We characterize our future state as "nimble," where IT is embedded in*

(*Case Continued*)

*our business strategies and we in EIS can support change without disrupting our operation, which is global, mobile, and always-open-for-business.*

*If you look at what it will take to survive, CIOs have to figure out (1) how to achieve better strategic alignment across the corporation, the business units, and IT investments; (2) how to deliver high-quality service while driving out costs; and (3) what the right organizational model for IS should be. We don't yet know the right organizational model for EIS, but we do know we must transition our skill set from managing subordinates to negotiating and delivering services.*

During their due diligence on how to put the theory of process orientation into practice, McGrane's team discovered ITIL (Information Technology Infrastructure Library), a process-based framework for managing IT service delivery. Rather than start from scratch on defining IT processes, ITIL has been adopted.

"We chose ITIL because it supports our strategy. It focuses on service management—aligning services with future needs, improving service quality, and improving long-term costs—just the issues we need to solve," says McGrane.

***ITIL*** ITIL was developed by the U.K. Office of Government Commerce (OGC) in the late 1980s to improve IT service delivery by the U.K. central government. The result was a set of books that describes best practices in IT service delivery. The books, edited by OGC, were written by numerous organizations and verified by others.[6] An entire industry has grown up around ITIL, providing training, consulting, certification, and even trade associations.

The main tenet of ITIL is that the IT infrastructure—which includes not only hardware and software but also skills, communications, and documentation—supports the delivery of IT services and thus needs to be managed professionally. ITIL calls this management IT service management, and it has two main sets of IT management processes: service delivery and service support. The two ITIL books on these subjects describe the key components of these processes and provide guidance on how to create and operate them.

Service delivery is composed of five tactical processes, all aimed at the long-term planning and improvement of IT services:

- *Availability management* is the process of optimizing the capacity of the IT infrastructure.
- *Capacity management* is the process of managing resources at a time of high demand (such as a crisis) and predicting the need for extra capacity in advance.
- *IT service continuity management* is the process of managing the organization's ability to continue providing an IT service after a business interruption.
- *Service-level management* is the process of continually improving the quality of an IT service.
- *Financial management for IT services* is the process of being a good steward of the organization's money.

Service support is composed of one operational function and five operational processes. All aim to ensure that customers have access to the services they need to support their business. The

(*Case Continued*)

processes differ from the function in that they are measured by their outcome:

- *Service desk* (a function, not a process) provides one point of contact for users.
- *Incident management* is the process of restoring a disrupted service.
- *Problem management* is the process of diagnosing the causes of incidents and preventing them.
- *Change management* is the process of handling changes efficiently.
- *Release management* is the process of managing new versions of a service.
- *Configuration management* is the process of managing all the components of a service or the infrastructure.

The five other ITIL books deal with the processes of security management; infrastructure management (such as managing network services); application management; planning to implement service management; and three books for business managers on integrating IT into the business in times of change, dealing with transitions in the IT infrastructure, and understanding the role of managers in improving IT service delivery.

***Implementing ITIL at MeadWestvaco*** The EIS structure McGrane implemented in 2002 has not changed. Four major steps toward the transformation of EIS have been to (1) put IT governance in place, (2) assign the first business relationship manager, (3) begin creating the service catalog, and (4) pilot test three ITIL-based processes.

*IT Governance Is in Place.* "In our industry, the economics dictate that we centralize IT to cut costs. We cannot afford decentralization. To achieve business alignment, we are using IT governance structures," notes McGrane.

The overall model is one of stewardship; that is, actively managing the assets that have been entrusted to us for the good of the organization. The three bodies handle IT governance:[7]

- The *EIS Steering Committee* acts as an internal board of directors for IT. It is chaired by the business, approves IT's strategic direction, oversees IT investments, and resolves disputes.
- The IT Council represents the interests of the business units and the corporation. It is chaired by the CIO and includes information officers from the units. On the one hand, the members advocate projects that drive unique value for a particular business. On the other hand, they present decisions to their respective areas to ensure alignment. The council also drives standards, oversees service level management, and approves the IT infrastructure.
- Business Performance Teams represent the interests of business process teams. They are chaired by process owners or business leaders, they drive initiatives aimed at improving business performance, and they ensure that standards are being followed.

*The First Business Relationship Manager Has Been Assigned.* So far, one business relationship manager has been assigned to a MeadWestvaco business unit. This senior IT executive acts as both coach

*(Case Continued)*

and account executive for that unit—a step toward improving "the interface point" between EIS and the unit. Together, McGrane and the business unit's head (who was very open to having such an intermediary) decided on the new appointment. He was chosen for his business–IT acumen. Others will be chosen for the same capability.

"The benefit of this new position is that the business unit gets a single point of contact," says McGrane. "Later, these managers will become their unit's advocate within EIS. The benefit to us in EIS is that we will get better information coming back to us from the business units. The goal is more efficient and effective relationships."

*The EIS Service Catalog Was Developed.* The service catalog essentially documents the EIS–business conversation about what services EIS provides and what users and customers expect. It is a major part of the transformation, so EIS is going through formal planning stages to create it.

It contains a high-level listing of EIS's services, productivity tools, connectivity options, applications, consulting, and application development services. Each service has a service-level agreement that tells users and customers what to expect, and the cost. To support these services, EIS puts in place the formal ITIL support processes noted earlier.

ITIL is actually very complex. Each process has subprocesses (activities and tasks). Tasks become roles. Roles are aggregated into jobs. Once defined, McGrane faces the challenge of introducing this process-based organization into his current function-based organization. McGrane is spending about 50 percent of his time on this internal reorganization, 40 percent of his time on corporate and business unit issues, and 10 percent with MeadWestvaco customers. He says, "That's not enough time outside the company. Once the internal reorganization is accomplished, I hope to be working more externally with our larger customers, to exploit supply-chain technologies. At the moment, that work is happening at a lower level."

***The Role of the Business*** "For business executives to be truly involved in guiding IT, they must have a fairly high level of IT maturity," notes McGrane. He continues:

> *In essence, they need to know as much about using IT to run their business as they already know about finance. They must be able to judge the value of an IT investment and balance that value against the operational changes they will need to make (in processes, people, investments).*
>
> *IT investment decisions are complex, and IT vendors' commercials do not portray this complexity. I wish they would stop promising simple silver bullets—like "Just outsource everything to us and we'll handle it for you"—because they are creating a hostile environment between IT and the business. In reality, we could not afford to outsource all IT to a vendor—nor would we.*

The IT governance structure, the business relationship managers, and the process teams are creating the context for the in-depth IT-business conversations that need to take place for the business

(*Case Continued*)

executives to understand the IT issues and become truly involved in guiding IT. They are a start to MeadWestvaco's emerging ITIL model.

Thanks to the new IT infrastructure, MeadWestvaco has reinvented its culture, business practices, and innovation. Its ability to effectively manage customer relationships has led to new solutions. The global company has been recognized as the power behind the consumer package. ■

## QUESTIONS AND EXERCISES

### Review Questions

Review questions are based directly on the material in the chapter, allowing the reader to assess comprehension of the chapter's key principles, topics, and ideas.

1. What changes are taking place in the external business environment?
2. What changes are occurring in the internal organizational environment?
3. What are the goals of the new work environment?
4. Give two or three characteristics of the technology trends in hardware, software, data, and communications.
5. What is the mission for the IS organization recommended by the authors? How does it differ from earlier perceptions of the purpose and objectives of information systems?
6. Summarize the four main components of the model of the IS function (Figure 1-6).
7. List several attributes of procedure-based and knowledge-based information activities. Which do you think are most important? Why?
8. How did Mead focus on end-user computing in the 1980s?
9. What was Mead's 1990 strategy?
10. Why did Mead choose to implement ERP?
11. Give an example of a MeadWestvaco governance structure to govern overall IT investments.
12. What four "buckets" is MeadWestvaco moving toward to define its IT investment portfolio?
13. What has been the effect of ERP on MeadWestvaco's decision making?
14. As of mid-2004, what four steps had McGrane taken to transform EIS into an ITIL-like, process-driven organization? Briefly describe each step.
15. Describe the three IT governance bodies at MeadWestvaco and what each does.

### Discussion Questions

Discussion questions are based on a few topics in the chapter that offer a legitimate basis for a difference of opinion. These questions focus discussion on these issues when the book is used in a seminar or classroom setting.

1. Even though the PC dispersed control of processing power out of the IS organization, the Internet is returning control to the department. Do you agree or disagree? Discuss.
2. Do we really need a major change in the way the IS function is structured? Are the necessary changes just minor modifications to accommodate normal growth in computer uses? Discuss.
3. The procedure–knowledge dichotomy does not add much beyond the clerical–managerial distinction. Do you agree or disagree? Give reasons for your opinion.
4. The Internet-based economy is going to end up just like the old economy with the huge conglomerates controlling everything. Do you agree or disagree? Is this situation desirable or not?
5. Discuss the limits and boundaries of the Internet. How pervasive is it in our lives, as workers and consumers? How it will affect the business landscape in the next 10 years?

### Exercises

Exercises provide an opportunity for the reader to put some of the concepts and ideas into practice on a small scale. In particular, one exercise in each chapter requires a student, or a team of students, to visit a local company and discover how the ideas in the chapter are being implemented in that company.

1. Show how MeadWestvaco's 2002 interim organizational structure compares with the model in Figure 1-6 by entering its functions on the figure.
2. Contact a company in your community and prepare a diagram and narrative to describe the structure of its IS function. Compare it with Figure 1-6 and with MeadWestvaco's current structure.
3. Find an article about how companies are melding the Internet with their traditional ways of working. Present those ideas to your peers.

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7. For more discussion of MeadWestvaco's IT governance structure, see Peter Weill and Jeanne Ross, *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results*, Harvard Business School Press, 2004, pp. 94–96; and CIO Magazine, "From Chaos, Agility," *CIO Magazine*, June 1, 2004.