

WARNING CONCERNING COPYRIGHT RESTRICTIONS

Under certain conditions specified in the United States Copyright law (Title 17, United States Code) libraries and archives may be authorized to furnish a photocopy or other reproduction. One of these conditions is that the photocopy or reproduction may not be 'used for any purpose other than private study, scholarship, or research' and that only one copy be provided for scholarly purposes, unless copyright fees are paid. Further reproduction of paper copies made from this computer system may be in violation of copyright laws and is prohibited.

PLEASE TYPE, OR PRINT LEGIBLY, IN BLACK INK - THIS PAGE MAY BE SCANNED

RAMSEY LIBRARY RESERVE MATERIALS FORM

PHOTOCOPIES

THIS ITEM TO BE PLACED ON:

- TRADITIONAL RESERVE (ALLOW 48 HOURS TO PROCESS)
 ELECTRONIC RESERVE (ALLOW 1 WEEK TO PROCESS)

TITLE AS YOU WANT IT LISTED:

The Management Information Systems Organization

DATE

1/22/03

FALL

INSTRUCTOR

M.L. Manns

SPRING

COURSE NUMBER

Mgmt 386

SUMMER

COURSE NAME

Systems & Info Mgmt

INSTITUTION

UNCA

THIS FORM MUST ACCOMPANY EACH RESERVE ARTICLE. EACH PAGE OF AN ARTICLE MUST BE VERTICALLY DISPLAYED ON A SINGLE-SIDED SHEET OF 8 1/2" X 11" WHITE PAPER.

In compliance with copyright law, the 1st page of any reserve article *must* contain the bibliographic information requested below, in full. Fill out a separate sheet for each item you wish to be placed on reserve.

() Title of Periodical _____
Title of Article _____
Author _____ Year _____
Volume _____ Issue _____ Pages _____

() Title of Book Managing + using Information Systems
Article Title or Chapter chapter 8
Author Pearlson, K.E
Edition/Date of Publication 2001 Publisher NY: John Wiley + Sons
Pages 161 - 180

THE MANAGEMENT INFORMATION SYSTEMS ORGANIZATION*

Until January 1993, Cisco Systems, Inc. maintained a traditional information systems (IS) department. Considered a cost center, it reported through the finance department. However, in an effort to increase information technology's (IT's) contribution to the bottom line, Cisco made three organizational changes: IS began reporting to Customer Advocacy; it introduced client-funding, charging project costs to the client department and reducing the portion charged to general and administrative expenses; and IT investment decisions that had been made by an IS steering committee were now made by line organizations. Cisco's new budgeting method made each of the business executives think seriously about IT expenses and how they should be allocated.¹

Cisco still manages IT centrally, and even client-funded projects are managed by the central IT organization. The chief information officer (CIO) has authority over all IT staff and contractors. Cisco management believes that its organizational strategy helped stabilize the company during a period of fast growth.

IS organizations come in all shapes and sizes. Each is built around processes that it performs or supports. These processes fulfill specific needs of internal customers. For instance, a telecommunications company with a large technology infrastructure may require distributed processing capabilities, whereas a regional manufacturing plant may require only back-office support.

Although each IS organization is unique in many ways, all have elements in common. The focus of this chapter is to introduce managers to the typical activities of an IS organization in order to facilitate interaction with management information systems (MIS) professionals. Managers will be a more effective consumer

* The author wishes to acknowledge and thank David M. Zahn, MBA '99 for his help in researching and writing early drafts of this chapter.

¹ R. Nolan and K. Porter, "Cisco Systems, Inc." Harvard Business School case 398-127, April 2000.

of services from MIS professionals in their organization if they understand, in general, what they do. This chapter examines the roles and tasks of the IS organization. In addition, it addresses recent issues surrounding IS organizations—in particular, outsourcing, return on investment, and decentralization.

► UNDERSTANDING THE MIS ORGANIZATION

Consider an analogy of a ship in a regatta to help explain the purpose of an IS organization and how it functions. A ship transports people and cargo to a particular destination, in much the same way that an IS organization directs itself toward the strategic goals set by the larger enterprise. Sometimes the IS organization must navigate perilous waters or storms to win a regatta. For both the IS organization and the ship, the key is to perform more capably than any competitors. This means employing the right resources to propel the enterprise through the rough waters of business. Each of these resources is discussed below.

Chief Information Officer

If an IS organization is like a ship, then the CIO is at the helm. The CIO is an executive who manages IT resources in order to implement enterprise strategy. The Gartner Group defines a CIO as one who is:

To provide technology vision and leadership for developing and implementing IT initiatives that create and maintain leadership for the enterprise in a constantly changing and intensely competitive marketplace.²

This definition may seem clear, but to understand what the CIO does, we should explore the historical origins of this position. The CIO function is a relatively new position when compared to the more established chief executive officer (CEO) or chief financial officer (CFO), which have existed in the corporate structure for decades. In fact, the CIO position did not really emerge until the early 1980s, when there was a perceived need for an executive-level manager to focus on cutting the ever-increasing costs of IT. Cost-cutting measures typically took the form of outsourcing arrangements, which is addressed later in this chapter.

The evolution of the CIO's role closely follows the evolution of technology in business. Throughout the late 1980s and into the 1990s, technology grew from an expensive necessity to a strategic enabler. As technology's role has risen in importance, so has that of the CIO. In fact, many organizations include the CIO as an integral member of the executive-level decision-making team.

CIOs are a unique breed. They have a strong understanding of the business and of the technology. In many organizations they take on roles that span both of these areas. More often than not, CIOs are asked to play strategic roles at some

part of their day, and operations roles at other times, rather than spending all of their time on one or the other. Eleven responsibilities define the CIO role:

- **Championing the organization**—promoting IT within the enterprise as a strategic tool for growth
 - **Architecture management**—setting organizational direction and priorities
 - **Business strategy consultant**—participating in executive-level decision making
 - **Business technology planning**—bridging business and technology groups for purposes of collaborating in planning and execution
 - **Applications development**—overseeing legacy and emerging enterprise initiatives, as well as broader strategic business unit (SBU) and divisional initiatives
 - **IT infrastructure management (e.g., computers, printers, and networks)**—maintaining current technologies and investing in future technologies
 - **Sourcing**—developing and implementing a strategy for outsourcing (vendors retaining in-house) IT services and/or people
 - **Partnership developer**—negotiating relationships with key suppliers of IT expertise and services
 - **Technology transfer agent**—providing technologies that enable the enterprise to work better with suppliers and customers—both internal and external—and consequently, increase shareholder value
 - **Customer satisfaction management**—understanding and communicating with both internal and external customers to ensure that customer satisfaction goals are met
 - **Training**—providing training to IT users, as well as senior executives who must understand how IT fits with enterprise strategy
- A CIO must work effectively not only within the technical arena, but also in overall business management. This unique skill set demands a specialized background. The following nine skills are considered essential for success as a CIO:³
- A strong orientation towards business in the enterprise industry or through related activities, such as consulting
 - Ability to realize the benefits and manage the cost and risks associated with IT
 - Ability to bridge any gaps between available technologies and business needs
 - Familiarity with the needs of nontechnical internal clients

- Strong organizational skills to manage localized IS resources and applications as well as broader SBU and divisional resources and initiatives
- Ability to conceive, build, and implement multiple IT projects on time and within budget
- Ability to articulate and advocate for a management vision of IT
- Ability to mesh well with the existing management structure
- A strategic vision for the enterprise that extends beyond IT

Where the CIO fits within an enterprise is often a source of controversy. In the early days of the CIO position, when the CIO was predominantly responsible for controlling costs, the CIO reported to the Chief Financial Officer (CFO). Since the CIO was rarely involved in enterprise governance, this reporting structure worked. But as IT burgeoned into a source for competitive advantage in the marketplace, reporting to the CFO proved too limiting. Conflicts arose because the CFO misunderstood the vision for IT or saw only the costs of technology, or because management still saw the CIO's primary responsibility as controlling costs. More recently, CIOs report directly to the CEO, President, or other executive manager.

Confusion often occurs regarding whether the CIO is more of a strategist or operational manager. He or she is often asked to be both. Since the CIO is the top IS professional in the hierarchy, it is imperative that this person also be a strategist. The title CIO signals to both the organization and to outside observers that this executive is a strategic IS thinker, and is responsible for linking IS strategy with the business strategy. And with the increasing importance of the Internet to every business, the CIO is increasingly asked to assist, advise, and participate in discussions where business strategy is set. However, just as the CFO is somewhat involved in operational management of the financial activities of the organization, the CIO is involved with operational issues related to IS. That includes activities such as identifying and managing the introduction of new technologies into the firm, setting purchasing and vendor policies, and managing the overall IT budget. Actual day-to-day management of the data center, the vendor portfolio, and other operational issues is typically not handled directly by the CIO, but by one of the managers in the IS organization.

However, some organizations choose not to have a CIO. These organizations typically have an individual responsible for running the computer systems, and possibly for managing many of the activities described later in this chapter. But they signal that this person is not a strategist by giving them the title of data processing manager or director of information systems or some other reference that clearly differentiates this person from other top officers in the company. Using the words "chief" and "officer" usually implies a strategic focus, and some organizations do not see the value of having an IS person on their executive team.

What, then, does a CIO do? Although there is no such thing as an average day in the life of a CIO, the following example provides a reference point. In 1996, Levi Strauss & Company sought a new CIO.⁴ Although Levi Strauss's IT was in accept-

able shape, problems existed. First, the IS organization was viewed by many as a stepchild, a necessary component of the enterprise, but one that did not contribute materially to its success. Second, Levi Strauss was working to recover from a massive reorganization earlier in the decade, which had cost millions of dollars and hundreds of jobs, as well as waning morale, lingering resentment, and general ill will. Finally, the role of IT was poorly matched to the strategic goals of the company. The new CIO faced a daunting job: solve Levi Strauss's Y2K problem, deliver new IT tools—such as those that could produce the new custom-fit jeans called Personal Pair to retail outlets—develop new metrics for tracking IT's value, and forge new relationships with external and internal business leaders.⁵

The new CIO, Linda Click, was a 21-year veteran of Levi Strauss known for her practicality, partnering capabilities, and ability to get the job done. Peter Iacobi, the president of Levi Strauss, described her as fearless. In her job as CIO, Click tackled the Y2K problem, brought a new attitude to the much-maligned IS department, and began to form the executive-level partnerships required to become an advocate for IT within the Levi Strauss organization. She led Levi Strauss, in late 1998, to enter the world of electronic commerce with an online store. No one could tackle all of Levi Strauss's problems overnight, but Click's situation typifies the challenges CIOs face.

Chief Knowledge Officer and Other Similar Roles

Although the CIO's role is to guide the enterprise toward the future, this responsibility is too great to accomplish alone. Many organizations have recognized that certain strategic areas of the IS organization require more focused guidance. This recognition has led to the creation of new positions, such as the chief knowledge officer (CKO), chief technology officer (CTO), chief telecommunications officer (also CTO), chief network officer (CNO), and chief resource officer (CRO). See Figure 8.1 for a list of their different responsibilities. Each of these positions typically subordinates to the CIO, with the occasional exception of the chief technology officer. New "chief" roles spring up almost daily as enterprises try to share the complex and growing responsibilities of managing IT. For example, General Motors has established divisional CIO positions that report to the corporate CIO.⁶ Other firms have eliminated the CIO altogether in favor of some configuration of the typically subordinate positions. These enterprises hope that flatter organizations will prove more effective.

Other Information Systems Organizational Roles

In addition to the CIO role, MIS organizations are home to many different types of professionals. This section describes some of the most common roles.

Title	Responsibility
Chief knowledge officer (CKO)	Create a knowledge management infrastructure Build a knowledge culture Make corporate knowledge pay off
Chief technology officer (CTO)	Track emerging technologies Advise on technology adoption
Chief telecommunications officer (CTO)	Operate in some companies at same level as CIO Focus on technology across all MIS functions
Chief network officer (CNO)	Contribute to strategy formulation
Chief resource officer (CRO)	Build and maintain internal and external networks Manage outsourcing relationships

FIGURE 8.1 The CIO's lieutenants.

IS Managers

Under the CIO and his or her lieutenants are IS managers. While the strategists set a direction for the enterprise, the managers implement the strategy. IS managers lead systems implementation projects and various IT departmental efforts. They must understand both sides of the technology/business fence and closely align themselves with the general managers of the enterprise. They also must understand both the big picture and the details of the operation. For example, in an Oracle General Ledger implementation project, an IS manager might assume responsibility for budget, progress, problem resolution, and contract issues. He or she would ensure that project operations reflect strategic directions set at the executive level.

The business counterpart to the IS manager is the general manager. General managers set business strategy, identify business opportunities, and, most importantly from an IS perspective, work with IS managers to implement those strategies. A partnership between general managers and IS managers is essential if IT is to fulfill its role as a strategic business enabler. To use the example of the Oracle implementation cited above, a general manager would work with the IS manager to solve such problems as a lack of sufficient detail in the general ledger system or software bugs that prevent the production of key reports.

Systems Developers

Systems developers write new software applications, upgrade existing ones, and maintain current systems. They come with a broad skill set, but typically need programming abilities, an understanding of general business concepts, familiarity with systems development and related lifecycle methodologies, creative problem-solving talents, and cross-technology knowledge. In the Oracle General Ledger implementation project, the systems developer would code modifications to various Oracle application modules and interfaces with legacy systems, as well as solve tech-

Business Analysts

Business analysts translate business requirements into implementable IT solutions. They work closely with business leaders and systems developers to ensure coordinated development and maintenance efforts. Business analysts' skills include an understanding of core business requirements, an equivalent understanding of the technological possibilities at hand, and the ability to communicate effectively at all levels of the IS and business organizations. In the Oracle implementation project, a business analyst would manage the defining of operations, the gathering and mapping of business requirements, and the delivery of solutions to the business customer.

Database Administrators

Database administrators (DBAs) implement and maintain the software and hardware that houses networked business applications and data. They keep the systems running smoothly. It is often said that the best DBAs are never seen, since DBAs typically surface when problems occur. A DBA's skill set focuses on technology—specifically, multiple operating systems, hardware products and services, programming languages, networking, telecommunications, and other technologies that utilize databases. In the Oracle implementation project, the DBA would build the relational database management system (RDBMS), install software and server upgrades, develop system backups, and troubleshoot development and production problems.

Operations Personnel

These men and women run, monitor, and maintain the production hardware and software applications within an IS organization. They are often found in data centers, where mainframes or servers are housed. Their skills vary but typically involve specialized knowledge of hardware or software sufficient to monitor and maintain it. Operations personnel often possess such detailed knowledge that they are consulted about the adoption of emerging technologies. In our running example, an operations person would take over most server monitoring responsibilities once the general ledger system was implemented.

Support Personnel

Support personnel fill roles throughout the IS organization, including the help desk, project management, and desktop services. Their skills vary. In the Oracle example, support personnel might take responsibility for recruiting new project team members, installing new PCs and software for them, and developing a process for providing product support to business system users.

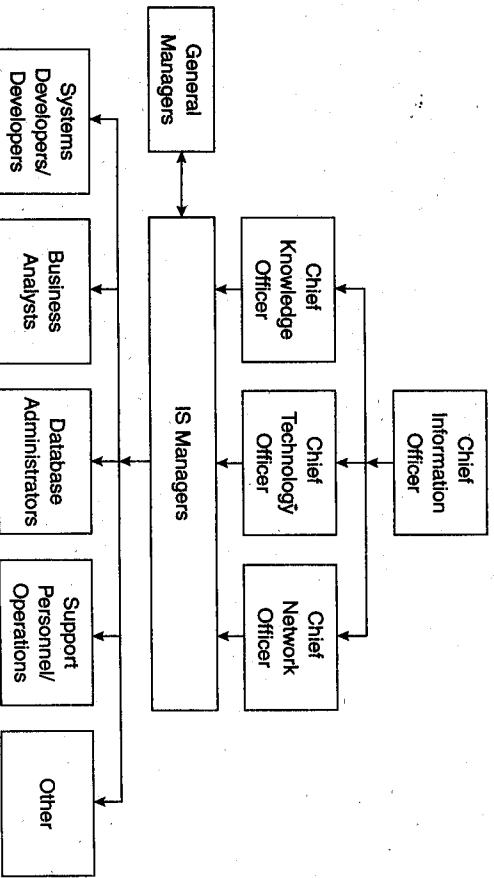
Developers

Most organizations have a group dedicated to developing new processes, methodologies, products, and services. People in these groups often employ multidisciplinary skills to develop or identify next-generation products. They may form cross-functional teams to better meet the needs of a particular development effort. They might develop a new project management system for use in our general ledger implementation effort. This system would feature a software component, but also

Webmaster, Web Designer, Web Developer, and Other Web-Based Roles

With the proliferation of the Internet into just about every aspect of business comes a new series of roles for most IS organizations. Many do similar functions to those described above, only they focus on the Web. However, with the Web comes a new type of responsibility for IS organizations, namely to build systems that are both seen by internal employees and external customers, shareholders, and others. That means systems must be designed, developed, and managed differently. And that responsibility falls on the IS organization. A webmaster is typically the top person in the organization who bears the primary responsibility for all web activities. This person is typically one of the early adopters of the Web, and has extensive knowledge in many areas including coding, design, hyper-linking, and web trends. The web designer is the person who designs the interfaces for each web page, and typically has some background in user interface design, graphic arts, and other visual expertise. The web developer is the person who actually codes the web pages since C++ (see Chapter 7 for more on these technologies) and of the technical background needed to put web pages on the servers. Other web-based roles crop up frequently as organizations seek ways to identify the individuals charged with responsibility for their organization's website. Many are given outrageous names, such as czar of the Web (like a CIO only restricted to the Web), content guy (makes sure the content that needs to be on the web page is on the page), digital yenta (makes matches between web specialists and organizations that need them), and vibe evolver (identifies new trends to put on the web).

There are many other roles within an IS organization, including networking specialists, implementation consultants, and vendor-relationship specialists. The simplified IS organization chart shown in Figure 8.2 gives a view of the reporting relationships that can exist.

**▶ INFORMATION SYSTEMS ORGANIZATION PROCESSES**

The general manager needs to understand the processes internal to the IS group in order to interact effectively with that group to accomplish business goals. Several processes that typify most IS organizations are discussed in the following section.

Systems Development

The primary processes done by most IS organizations is that of developing systems. Systems development itself will be discussed in more detail in Chapter 10, the chapter on project management. In general, designing and building systems is a core process for most IS organizations. In some cases, it means analyzing needs, designing the software, writing or coding the software, and testing to make sure the software works and meets the business objectives. However, with the proliferation of software companies offering a wide range of packages off the shelf, there is a trend toward buying, rather than making, systems. In that case, systems development processes identify and acquire outside software packages to fill a need for individuals in the organizations. This process also includes installing the package and setting any necessary options and parameters to ensure the system runs properly.

Systems Maintenance

Once installed, systems do not function entirely on their own. Many people work toward their continued maintenance. For instance, once a general ledger system is installed, support personnel or DBAs monitor the daily processing of transactions and reports. Developers and business personnel address post-implementation needs, such as writing additional reports or reconciling system errors. Systems developers provide upgrades as they become available. Business managers interact with process managers to arrange access to new reports, or to report problems they experience with systems functioning.

Data Center Operations

Data centers are common among enterprises that take a more centralized approach to IS organization. The data center typically houses large mainframe computers or rows of servers. Most of the company's data and business applications reside somewhere in the data center alongside remote-access technologies that connect the enterprise to the outside world.

Data center personnel vary in skill, but most maintain familiarity with the nuts and bolts of the installed hardware and software. Often, the most technical of people can be found in data centers due to the mission-critical nature of the technologies that reside there.

General managers rarely have direct contact with data center personnel unless they experience processing problems. Such problems are usually reported to IS

Although these reports are sometimes made electronically, larger problems often require direct contact. A typical report looks similar to Figure 8.3.

Internet and Networking Services

Such technologies as intranets, extranets, web pages, and e-mail are becoming essential in most business environments. General managers must interact with IS organization members who develop and maintain Internet capabilities. Since levels of these services will vary greatly with each organization, working with the right person is essential. Often Internet business needs remain ambiguous unless the general manager and IS staff can collaborate to develop a strong vision for the enterprise.

In order to implement a successful website, the IS manager and the general manager must agree on a team to support a variety of activities. At a minimum, processes needed by an organization to run a robust web page include the site design process and the site maintenance process. Increasingly, companies are considering outsourcing many of their web-based activities, which means that someone must manage and coordinate these services in order to ensure that the right services are provided. For example, should managers decide to use a web-based ERP system, someone in either the IS organization or the business itself must be charged with managing the vendor, and with ensuring the appropriate level of service is obtained.

Since the early 1980s, networks have grown tremendously, resulting in a growth of networking groups as well. When there are problems connecting to the local area network (LAN), or when a new user needs to set up new PCs for a department, the networking group eventually processes the request. This side of the IS organization is visible to most end users.

Networking groups design network architecture and build and maintain the network infrastructure, keeping abreast of the latest technology and anticipating future needs. Upgrading networks is often expensive and slow, so anticipating future needs is an important concern. Networking people tend to be in high demand. The wide range of technologies on the market and the variable nature of networks

Problem Ticket #	Description of Problem	Resolution of Problem	Contact	Status	Cost of Non-Conformance
PR-17390	Job # 182 ended abnormally due to a disk failure	2200 hours—Problem detected 2300 hours—Bad disk replaced 2310 hours—Job restarted	Sally Operator	Closed	Delay did not affect processing window

FIGURE 8.3 Morning problem report example.

require personnel who can stay abreast of new technologies and understand how to use them within a given network architecture.

Often the set of processes that manage the physical telephone network is called telecommunications. Although some may not realize that telecommunications falls under the purview of IS, it constitutes a vitally important strategic concern. Telephone systems, certain networking systems, and access to the Internet all may fall under the rubric of telecommunications. And as new wireless technologies become popular, they are managed by these processes. General managers should concern themselves with telecommunications because the quality of service provided will affect the daily operations of the business. Telephones that do not work or voice mail systems that lose messages can affect the bottom line. Moreover, telecommunications costs are typically charged back to the business area cost center.

New Technology Introduction

Staying abreast of new technology is one of the most important functions an IS organization can perform, yet it is sometimes neglected. Missing technology trends gives the competition the chance to capitalize on new costs savings or sources of revenue. IT has assumed such strategic importance in the enterprise that new technology deserves a particular focus within IS.

New technology groups assess the costs and benefits of new technologies for the enterprise. They are the way many innovations formally enter an organization. The new technology group works closely with business groups to determine which technologies can provide the greatest benefit and how the technologies might impact the organization. Technology personnel stay abreast of trends through online newsletters, periodicals, trade shows, product testing, and close relationships with user groups and vendors.

Special Projects

IS organizations are organized to anticipate most business requests, but frequently requests require efforts beyond the scope and capacity of the current organization. These special requests often spur the formation of special project teams. Typically, such teams receive a fair degree of autonomy within the organization, and they focus solely on the project at hand. For example, under most circumstances, the staff who maintains the current general ledger system cannot also implement a new system. A different group can better address the special requirements and workload entailed. Typically, however, maintenance staff will transfer from their current positions to be a part of the special project. A general manager will confer with IS managers to set systems requirements and with project team members to address implementation requirements.

Resource Management

Business projects often require support from personnel with very specific IS skills. On occasions when these skills are not to be found within the IS organization,

business managers must still rely on IS colleagues to aid in the search outside the organization. Sometimes, IS personnel directly manage all hiring or contracting for the required services because they can leverage specialized knowledge of contract labor houses or negotiated outsourcing relationships.

General Support

Processes in place to support day-to-day business operations vary depending on the size of the enterprise and the levels of support required. Typically, support requests are centralized so they can be tracked for quality-control purposes. This centralization simplifies the interaction between business and IS. Often, a central support desk dispatches support personnel to address the problem at hand.

Often IS organizations maintain first client contact through a centralized help desk even for such diverse services as networking and telecommunications. The help desk serves as the primary point of contact for technical questions and problem reporting. Centralizing help desk activities allows IS managers to track performance and results more efficiently. It also gives business people a single phone number or e-mail address to remember in times of need.

Help desks are not usually manned by people who will solve the problem. Help desk personnel collect pertinent information, record it, determine its priority, contact the appropriate support personnel, and follow up with the business contacts with updates or resolution information. For help beyond daily support, most organizations also maintain a customer service request (CSR) process. A paper or electronic form is used to allow a business person to describe the nature of the request, its priority, the contact point, and the appropriate cost center. CSRs initiate much of the work in IS organizations.

► WHAT TO EXPECT FROM INFORMATION SYSTEMS

Managers must learn what to expect from the IS organization so they can plan and implement business strategy accordingly. A manager can expect six core activities: anticipating new technologies, participating in setting and implementing strategic goals, innovating current processes, managing supplier relationships, establishing architecture platforms and standards, and managing human resources.⁷

Anticipating New Technologies

Technology moves at such break-neck speeds that for an enterprise to leverage state-of-the-art tools, IT must keep an eye toward the horizon. Doing so is not as simple as saying, "We need the latest version of *WareSoft Version 2.1.*" IT must weigh the risks and potential benefits of early adoption of technology. IT must understand technology trends so that the enterprise does not invest heavily in new technologies which quickly become obsolete or incompatible with other enterprise

standards. This situation is not unlike the situation many found themselves in after investing in the Beta format for VCRs, only to find themselves with useless equipment and tapes when the VHS format became the de facto standard. To correctly assess the enterprise's needs, business and IS staff must work closely to evaluate which technologies will advance the business strategy. It is the job of the IS department to scout new technology trends and help the business integrate them into planning and operations.

Strategic Direction

IS staff can enable business managers to achieve strategic goals by acting as consultants or by teaching them about developing technologies. As consultants, IS can advise managers on best practices within IT and work with them to develop IT-enhanced solutions to business problems. For example, Jim Dowling, the director of corporate information systems at Bose Corporation, designated more than 100 of his IT personnel as internal IT consultants.⁸ He asked them to fulfill a role similar to that of external consultants in that they understand and address both technical and business issues. As consultants, they act with a degree of autonomy from the current IT organization; their status provides them unusual flexibility in order to move quickly and, ultimately, save money.

IS personnel also educate managers about current technologies as well as IT trends. Sharing business and technical knowledge between groups encourages better, more informed decisions across the enterprise.

Process Innovation

IT staff should work with managers to innovate processes that can benefit from technological solutions. Such solutions can range from installing voice mail to networking personal computers or automating general ledger transactions. Business process reviews usually begin with a survey of best practices. IT becomes an integral component of new processes designed for the enterprise. Thus, IS personnel can play a crucial role by designing systems that facilitate these new ways of doing business.

Internal Partnerships

No longer anonymous techies, IS staff are partners in moving the enterprise forward. IS staff must seek to initiate, foster, and grow strong partnerships with their business colleagues. Greg Walton, vice president and CIO at Carilion Health System in Roanoke, Virginia, for instance, stations his internal consultants within the enterprise business units.⁹ Thus, Carilion's IT professionals both represent

⁷ Rockart, John F., Michael J. Earl, and Jeanne W. Ross. "Eight Imperatives for the New IT

⁸ Horowitz, Alan S. "IS Ambassadors." *Computerworld*, <http://www.computerworld.com/home/features.nsf/all/980420mgf>, April 20, 1998.

business concerns to the IS organization and IS concerns to the business leaders. This tighter relationship improves integration between systems and business.

Supplier Management

As more companies adopt outsourcing as a means of controlling IT costs and acquiring "best of breed" capabilities, managing these supplier relationships becomes increasingly important. IS must maximize the benefit of these relationships to the enterprise and pre-empt problems that might occur. Failure in this regard could result in deteriorating quality of service, loss of competitive advantages, costly contract disputes, low morale, and loss of key personnel.

One of the most famous illustrations of supplier management derives from the experience of an originator of the concept: the Eastman Kodak Company. In 1989, Kodak outsourced its data center operations to IBM, its network to Digital Equipment Company, and its desktop supply and support operations to Businessland.¹⁰ Kodak managed these relationships through strategic alliances. IBM and Kodak retained IS staff to act on behalf of its business personnel with outsource vendors. Vendor contracts created incentives for new investment in technology and provided enough flexibility to encourage quick problem resolution. Vendors made fair profits and received additional business if they performed well. Within a couple of years, Kodak's capital expenditures attributable to computing dropped by 90 percent.¹² Its approach to supplier management became a model emulated by Continental Bank, General Dynamics, Continental Airlines, and National Car Rental.¹³

Architecture and Standards

Given the complex nature of IT in the enterprise, the role of IS in developing, maintaining, and communicating standards is critical. Failure could mean increased maintenance costs due to incompatibilities between platforms, redundant or incorrect data, and slow processing. For example, precise naming standards are crucial in implementing a new data warehouse or accounts payable system. Even small variations in invoice entries—the difference between showing a payment to "IBM," "I.B.M.," or "International Business Machines"—could yield incomplete information when business managers query the data warehouse to understand how much was paid to the vendor in a given period. Inconsistent data undermines the integrity of a data warehouse.

Human Resource Management

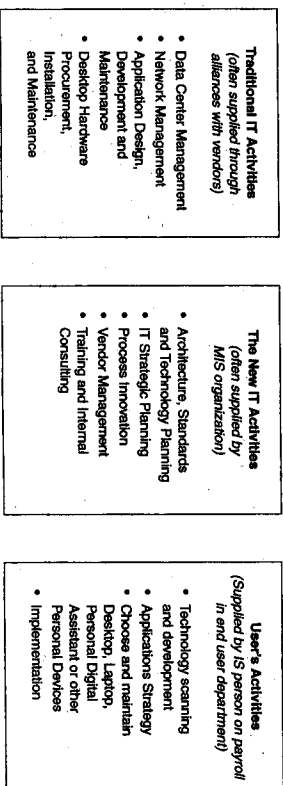
IS must manage its own resources. Doing so means providing sufficient business and technical training so that staff can perform effectively and retain their value to the enterprise. Additional human resource activities include hiring and firing, tracking time, and managing budgets, operations, and projects. Since most IS organizations lack their own human resource departments, individual managers bear these responsibilities.

Most IS activities fall within the categories described in this section. In addition, however, business managers can expect the user management activities shown in Figure 8.4.

► WHAT THE INFORMATION SYSTEMS ORGANIZATION DOES NOT DO

This chapter has presented typical roles and processes for IS organizations. Although most IS professionals are asked to do a wide range of tasks for their organization, in reality there are many tasks the IS organization should not do. Clearly, the IS organization does not directly do other core business functions such as selling, manufacturing, accounting, etc. But sometimes managers of these functions inadvertently delegate key operational decisions to the IS organization. When general managers ask the IS professional to build an information system for their organization and don't become an active partner in the design of that system, they are in effect turning over control of their business operations. Likewise, asking an IS professional to implement a software package without partnering with that professional to insure the package not only meets current needs, but future needs as well, is ceding control. The IS organization does not design business processes.

As discussed in Chapter 4, the use of IS for strategic advantage, the general manager, not the IS professional, sets business strategy. However, again, in many organizations, the general manager delegates critical technology decisions to the CIO, which in turn may limit the strategic options available to the firm. There is a role for the IS professional in the discussion of strategy. That role is one of suggesting technologies and applications that enable strategy, identifying limits to the technologies and applications under consideration, and consulting with all those



¹⁰ Applegate, L. and R. Montealegre. "Eastman Kodak Co. Managing Information Systems Through Strategic Alliances." *HBS* case no. 192030, September 1995.

¹¹ DiRonnald, Anthony, and Vijay Gurbaxani. "Strategic Intent for IT Outsourcing." *Sloan Management Review*, June 22, 1998.

involved with setting strategic direction to make sure they properly consider the role and impact of IS on the decisions they make. The IS organization does not set business strategy.

► OUTSOURCING AND DECENTRALIZATION

IS managers confront many of the same challenges other managers face in today's business environment. How IS managers address them will directly affect the work of the general managers. The earlier example concerning naming standards illustrates this point. Since small decisions such as a standard spelling for "IBM" on vendor payments can have far-reaching effects, larger decisions, especially strategic ones, will reach even further. This section discusses two key issues: outsourcing and decentralization.

Outsourcing

Since the 1970s, IT managers have turned to outsourcing as an important weapon in the battle to control costs. IT outsourcing means that an outside vendor provides services traditionally provided by the internal MIS department. Over the years, however, certain motives for outsourcing have changed. This section examines the history of outsourcing, models for outsourcing, its advantages and disadvantages, and issues to consider in deciding whether and how to outsource.

The classic model of outsourcing dictates that an enterprise should outsource only those functions that do not give it competitive advantage. For instance, main-frame computer maintenance and monitoring are not often considered core competencies of an enterprise and therefore are often farmed to vendors such as Computer Sciences Corporation or Electronic Data Systems. In the early days of outsourcing, such contracts ran long term—often for 10 years or more. Frequently, outsiders took over entire IS departments, including people, equipment, and management responsibility. This classic approach prevailed through most of the 1970s and 1980s, but then experienced a decline in popularity.

In the 1990s, outsourcing practices changed such that all IT became up for grabs—including aspects that provide competitive advantage. As relationships with outsiders have become more sophisticated, companies have realized that even such essential functions as customer service are sometimes better managed by experts on the outside. And the ubiquity of the Internet has spawned a series of new application service providers (ASPs) who perform similar services using web-based applications.

The first choice an enterprise faces about outsourcing is whether to pursue it fully or selectively. As the term "full outsourcing" implies, an enterprise can outsource all its IT functions from desktop services to software development. An enterprise would outsource everything if it does not view IT as a strategic advantage that it needs to cultivate internally. Full outsourcing can free resources to be employed in areas that add greater value. It can also reduce overall cost per transaction due

to size and economies of scale.¹⁴ Many companies outsource IT just so their managers are able to focus attention on other business issues. For example, in early 1998, the Connecticut state government outsourced all its IT assets, from desktop PCs to mainframes.¹⁵ The state CIO, Rock Regan, wanted to fix Y2K problems, standardize processing platforms, and cut costs. Regan's particular budget goal was to shrink his \$200 million yearly IT expenditure by as much as 15 percent. He chose full outsourcing because he knew that he could not compete in the marketplace for the skilled professionals he needed to accomplish his IT goals. Also, his underperforming IT architecture cried out for a complete overhaul.

With selective outsourcing, an enterprise chooses which IT capabilities to retain in-house and which to give to an outsider. A "best-of-breed" approach is taken in which suppliers are chosen for their expertise in specific technology areas. Although an enterprise can acquire top-level skills and experience through such relationships, the effort required to manage them grows tremendously with each new supplier. Still, selective outsourcing gives greater flexibility and often better service due to the competitive market.¹⁶ To illustrate, an enterprise might retain a web development firm to handle electronic commerce and at the same time select a large outsourcer such as Perot Systems to assume mainframe maintenance. This approach, also called "strategic sourcing," has been adopted by such firms as GM and Southland Corporation.

What factors drive companies to outsource? The most common is the need to save costs. Outsourcing suppliers derive savings from economies of scale. They realize these economies through centralized data centers, preferential contracts with suppliers, and large pools of technical expertise. Most often, enterprises lack such resources on a sufficient scale within their own IS departments. A single company may need only 5000 PCs, but an outsourcer can negotiate a contract for 50,000 and achieve a much lower unit cost.

A second factor driving companies to outsource is that highly qualified IT staff are difficult to retain. An employer must invest in continuous training so that IT staff can keep current with marketplace technologies and also provide them with competitive salaries. Current demand is such that a skilled IT professional need not remain long in a disadvantageous position. Large firms such as CSC, E&Y, PWC, D&T, and Anderson Consulting draw many talented IT professionals, who are then assigned to many different accounts. An outsourcer often can provide greater opportunity for training and advancement in IT than a single MIS organization.

Third, by bringing in outside expertise, management often can focus less attention on IS operations and more on information itself. MIS department personnel manage the relationships with outsiders and are ultimately still responsible for IS services. But outsiders are separate businesses, not internal departments.

¹⁴ Field, Tom. "An Outsourcing Buyer's Guide: Careat Empor." *CIO Magazine*, April 1, 1997.

¹⁵ Tinbodeau, Patrick. "Connecticut Outsources the Works." *Computerworld*, March 30, 1998.

¹⁶ Field, Tom. "An Outsourcing Buyer's Guide: Careat Empor." *CIO Magazine*, April 1, 1997.

Managers are freed to devote their energies to areas that reflect core competencies for the business.

Fourth, to the extent that outsourcers specialize in IS services, they are likely to understand how to manage IS staff effectively. An outsourcer often can offer IS personnel a professional environment that a typical company cannot afford to build. For example, a web designer would have responsibility for one website within a company, but for multiple sites at an outsourcer. However, to ensure that staff supporting a particular project are deployed to best advantage, the outsourcer and the management of the client enterprise must maintain a close working relationship.

Fifth, so long as contract terms effectively address contingencies, the larger resources of an outsourcer provide greater capacity on demand. For instance, at year-end, outsourcers potentially can allocate additional mainframe capacity to ensure timely completion of nightly processing, in a manner that would be impossible for an enterprise running its own bare-bones data center.

Finally, outsourcers generally provide access to larger pools of talent and more current knowledge of advancing technologies. For example, many outsourcers had vast experience solving Y2K problems, whereas IS staff within a single company only had limited experience. The vendor's experienced consultants were more readily available to the marketplace than any comparably trained and experienced IT professionals who might be recruitable for in-house employment. It becomes the outsourcer's responsibility to find, train, and retain this talent, not the in-house IS managers.

Oponents of outsourcing tend to cite four disadvantages (see Figure 8.5). A manager should consider each of these before making a decision about outsourcing. Each can be mitigated with effective planning and ongoing management.

First, outsourcing requires that a company surrender a degree of control over critical aspects of the enterprise. By turning over data center operations, for example, a company puts itself at the mercy of an outsourcer's ability to manage this function effectively. A manager must choose an outsourcer carefully and negotiate terms that will support an effective working relationship.

Second, outsourcing decisions can be difficult and expensive to reverse. Unless experienced IT staff can contribute elsewhere in the firm, outsourcing major IT functions means staff will be lost either to the outsourcers or to other companies. If an outsourcing relationship becomes difficult to manage, or if anticipated cost savings are not realized, returning to an "in-sourced" status will require the enterprise to acquire the necessary infrastructure and staff.

Third, outsourcing contracts may not adequately anticipate new technological capabilities. Outsourcers may not recommend so-called bleeding edge technologies for fear of losing money in the process of implementation and support, even

- Abdication of control
- High switching costs
- Lack of technological innovation
- Loss of ownership

if implementation would best serve the client. Thus, poorly planned outsourcing risks a loss in IT flexibility. For example, some outsourcers were slow to adopt Internet technologies for their clients because they feared the benefits would not be as tangible as the costs of entering the market. This reluctance impinged on clients' ability to realize business strategies involving e-business.

Fourth, by surrendering IT functions, a company gives up any real potential to develop them for competitive advantage—unless, of course, the outsourcing agreement is sophisticated enough to comprehend developing such advantage in tandem with the outsourcing company. However, even these partnerships potentially compromise the advantage since ownership is shared with the outsourcer, and the advantage may become available to the outsourcer's other clients. Under many circumstances, the outsourcer becomes the primary owner of any technological solutions developed. And they allow the outsourcer to leverage the knowledge to benefit other clients, possibly even competitors of the initial client.

Finally, contract terms may leave clients little recourse in terminating troublesome vendor relationships. Outsourcers avoid entering relationships in which they might face summary dismissal. Clients must ensure that contract terms allow them the flexibility they require to manage and, if necessary, sever supplier relationships.

Outsourcing decisions must be made with adequate care and deliberation. The steps outlined in Figure 8.6 are recommended when considering this option.

To illustrate the ins and outs of selective and full outsourcing, consider the case of a company that pursued both approaches. British Petroleum (BP) selected only a few outsourcers with short-term contracts to meet its IT needs.¹⁷ BP awarded Sema Group management of its data center, Science Applications International Corporation its European IT facility management and company-wide applications support, and Syncoxia its telecommunications and telex networks. This arrangement was selective in that BP chose each company for its particular expertise, but full in that BP turned over a significant percentage of its IT to outsourcers. Thus, it gained the benefits of best of breed and competitive pricing along with fewer

- Do not focus negotiation solely on price.
- Craft full life-cycle service contracts that occur in stages.
- Establish short-term supplier contracts.
- Use multiple, best-of-breed suppliers.
- Develop skills in contract management.
- Carefully evaluate your company's own capabilities.
- Thoroughly evaluate outsourcers' capabilities.
- Choose an outsourcer whose capabilities complement yours.
- Base a choice on cultural fit as well as technical expertise.
- Determine whether a particular outsourcing relationship produces a net benefit for your company.

FIGURE 8.6 Steps to avoid pitfalls.

¹⁷ Cross, J. "IT Outsourcing: British Petroleum." *Harvard Business Review*, May-June 1995.

contract management worries and the ability to develop long-term relationships. BP encouraged the outsourcers to work together to provide high-quality services.

What were the results of BP's approach? The company saw its IT costs fall from \$360 million in 1989 to \$132 million in 1994. At the same time, it gained more flexible IT systems and higher-quality service. BP saw its IT staff shrink by 80 percent. The remaining staff became internal consultants throughout the company. In fact, BP is considering outsourcing its internal consultants to other companies. Not all outsourcing arrangements are so successful, but BP illustrates the best case scenario.

What is the future of outsourcing? Every enterprise faces different competitive pressures. These factors shape how it will view IT and how it will decide to leverage IT for the future. Most will need to outsource at least some IT functions. How each enterprise chooses to manage its outsourced functions will be crucial to its success.