

# Chapter 3

## Information Systems, Organizations, and Strategy

### LEARNING OBJECTIVES

*After reading this chapter, you will be able to:*

1. Identify and describe important features of organizations that managers need to know about in order to build and use information systems successfully.
2. Evaluate the impact of information systems on organizations.
3. Demonstrate how Porter's competitive forces model and the value chain model help businesses use information systems for competitive advantage.
4. Demonstrate how information systems help businesses use synergies, core competencies, and network-based strategies to achieve competitive advantage.
5. Assess the challenges posed by strategic information systems and management solutions.

#### *Interactive Sessions:*

7-Eleven Stores Ask the Customer by Asking the Data

Amazon.com: An Internet Giant Fine-Tunes Its Strategy

### CHAPTER OUTLINE

- 3.1 **ORGANIZATIONS AND INFORMATION SYSTEMS**  
What Is an Organization?  
Features of Organizations
- 3.2 **HOW INFORMATION SYSTEMS IMPACT ORGANIZATIONS AND BUSINESS FIRMS**  
Economic Impacts  
Organizational and Behavioral Impacts  
The Internet and Organizations  
Implications for the Design and Understanding of Information Systems
- 3.3 **USING INFORMATION SYSTEMS TO ACHIEVE COMPETITIVE ADVANTAGE**  
Porter's Competitive Forces Model  
Information System Strategies for Dealing with Competitive Forces  
The Internet's Impact on Competitive Advantage  
The Business Value Chain Model  
Synergies, Core Competencies, and Network-Based Strategies
- 3.4 **USING SYSTEMS FOR COMPETITIVE ADVANTAGE: MANAGEMENT ISSUES**  
Sustaining Competitive Advantage  
Performing a Strategic Systems Analysis  
Managing Strategic Transitions
- 3.5 **HANDS-ON MIS**  
Analyzing Competitive Strategy: Dirt Bikes USA  
Improving Decision Making: Using a Database to Clarify Business Strategy  
Improving Decision Making: Using Web Tools to Configure and Price an Automobile

#### LEARNING TRACK MODULE

The Changing Business Environment for Information Technology

## WILL THE NEW US AIRWAYS BE ABLE TO FLY?

In September 2005, US Airways and America West Airlines merged to create something that may shake up the airline industry: a low-cost full-service airline. The new company, which retains the US Airways name, combines a fully developed national route network, first class seating, and customer loyalty program comparable to those offered by traditional airlines such as American and Continental with low prices competitive with budget carriers such as JetBlue, AirTran, and Southwest Airlines.

The merging companies couldn't have been more different in terms of their business strategies, organizational culture, and information systems: US Airways, which originated with the formation of All American Aviation in 1939, was a traditional hub-and-spoke carrier with an older workforce, lumbering bureaucracy, and a rigid information systems function that had been outsourced to Electronic Data Systems (EDS). America West was very different. Formed in 1981, it had a younger workforce, a more freewheeling entrepreneurial culture, and a penchant for managing its own information systems.

But by the late 1990s, both had something in common: They were considered airlines of last resort, that people flew only when there were no other alternatives. US Airways was forced to file for bankruptcy first in 2002 and again in 2004, laying off thousands of employees. America West was struggling with surging fuel costs and competition from Southwest Airlines, another low-cost carrier.

The US Airways merger was designed to create synergies between a traditional full-service airline and a newer low-cost carrier. The resulting company combines US Airways' experience and strong network on the east coast of the United States and America West's low-cost structure, information systems, and routes in the western United States.

Management believes the merger will produce \$600 million in annual cost savings. To achieve these cost savings, the new US Airways will reduce the merged companies' annual IT spending of \$240 million by about 40 percent by eliminating redundant information systems. The merged company adopted primarily the simple, flexible information systems and business processes of America West. It eliminated systems and business processes for carrying hazardous materials and handling unaccompanied minors on connecting flights because their costs were too high relative to the benefits they provided. The company only retained a few of the old US Airways' processes and systems, such as an application for determining where and when to purchase fuel or check-in applications to support international routes.

The new US Airways is now the fifth-largest carrier in the United States and the world's largest low-cost airline. Will it be successful? It's still too early to tell. It cost around \$75 to \$80 million to integrate the information system applications and business processes of the merging companies. Whether the merger will produce bene-



fits depends on how well the two companies' systems and business processes are integrated.

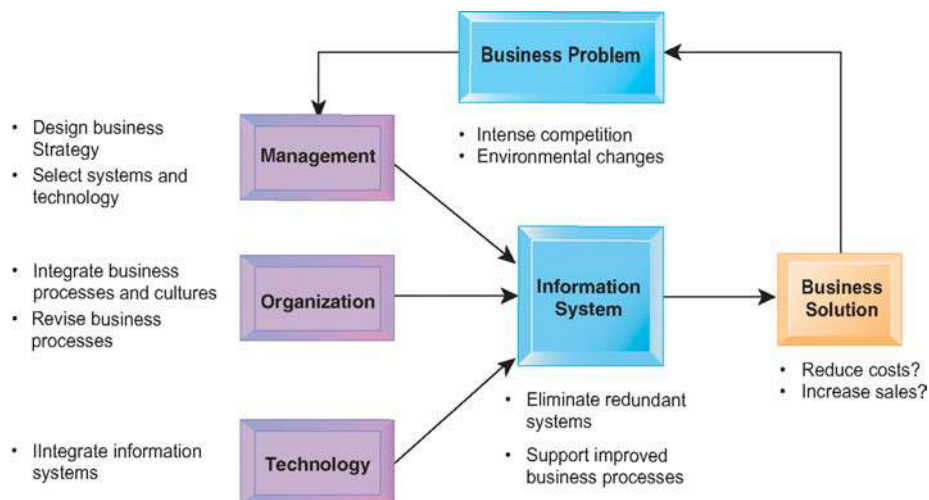
US Airways noted in regulatory filings “that the merger will result in certain synergies, business opportunities, and growth prospects” but the company “may never realize” them. “Significant challenges in consolidating functions, integrating...organizations, procedures and operations” will make the integration of the two airlines “costly, complex, and time-consuming.”

If the merger is successful, the new US Airways will have a network like Continental Airlines and a cost structure similar to Southwest. The question then becomes whether the company will be able to take advantage of its new strengths. A low-cost airline with a national network might still wind up as a carrier of last resort if it merely focuses on costs and does not provide a good customer experience. But if the new US Airways is able to provide customer value and service along with low costs, it could become a highly sought-after brand.

*Sources:* Stephanie Overby, “How to Save an Airline,” *CIO Magazine*, February 15, 2006; Tony Kontzer, “Merger on the Fly,” *Information Week*, February 27, 2005; and U.S. Airways, “U.S. Airways 10-K Report for the year ending December 31, 2005,” filed March 15, 2006.

The experience of US Airways illustrates the interdependence of business environments, organizational culture, business processes, business strategy, and the development of information systems. US Airways and America West merged in response to competitive pressures from their surrounding environment. The merging companies had different organizational cultures, business processes and information systems, which had to be integrated for the new company to run effectively. The new information systems—many taken over from a more modernized America West—had to be fine-tuned to support the new US Airways' business strategy. US Airways' systems effort can't succeed without a significant amount of organizational and management change.

The chapter-opening diagram calls attention to important points raised by this case and this chapter. Both US Airways and America West faced intense pressure from airline industry competitors and from rising fuel costs. Management at both companies decided their business strategy needed to change and it should focus on synergies created by merging. The new business strategy required investments in information systems, and changes in management and organization. The newly merged company provides value to customers by competing on both price and quality service. To make the merger



profitable, US Airways had to revise its business processes so that two formerly separate companies could operate as a single entity, and it also had to eliminate redundant information systems. The opening case also shows that such changes are not easy to make and that it is still unclear whether the new US Airways has a successful strategy and business model.

### HEADS UP

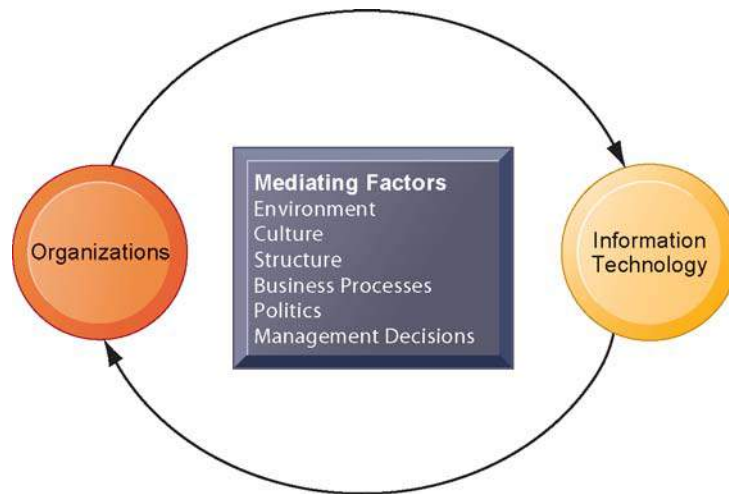
As a manager, you'll need to know about the relationship between organizations, information systems, and business strategy. This chapter first introduces the features of organizations that you will need to understand when you design, build, and operate information systems. Then it examines the problems firms face from competition and the various ways in which information systems can provide competitive advantage. Every business student and future manager should know about these strategic uses of information technology.

- If your career is in finance and accounting, you will be developing and managing strategic products and services that are largely based on information systems such as wealth management, financial advising, risk management systems, online financial services, and credit services.
- If your career is in human resources, you will be working with systems that could give your firm a strategic edge by providing information and communication capabilities that lower the cost of managing employees or by organizing jobs and work assignments to reduce operational costs.
- If your career is in information systems, you will be working with managers from all the other business areas to identify opportunities for strategic information systems and their technology requirements.
- If your career is in manufacturing and production, you will be developing production systems based on information technology and systems that help your firm compete by lowering supply chain costs, increasing quality, and enabling the firm to design and bring new products to market more rapidly.
- If your career is in sales and marketing, you will be working with information systems and technologies that create strategic advantages for your firm such as customer relationship management systems, online Web site monitoring tools, and business analytics tools that can help you understand your customers better.

## 3.1 ORGANIZATIONS AND INFORMATION SYSTEMS

**I**nformation systems and organizations influence one another. Information systems are built by managers to serve the interests of the business firm. At the same time, the organization must be aware of and open to the influences of information systems to benefit from new technologies.

The interaction between information technology and organizations is complex and is influenced by many mediating factors, including the organization's structure, business processes, politics, culture, surrounding environment, and management decisions (see Figure 3-1). You will need to understand how information systems can change social and work life in your firm. You will not be able to design new systems successfully or understand existing systems without understanding your own business organization.

**FIGURE 3-1 THE TWO-WAY RELATIONSHIP BETWEEN ORGANIZATIONS AND INFORMATION TECHNOLOGY**

This complex two-way relationship is mediated by many factors, not the least of which are the decisions made—or not made—by managers. Other factors mediating the relationship include the organizational culture, structure, politics, business processes, and environment.

As a manager, you will be the one to decide which systems will be built, what they will do, and how they will be implemented. You may not be able to anticipate all of the consequences of these decisions. Some of the changes that occur in business firms because of new information technology (IT) investments cannot be foreseen and have results that may or may not meet your expectations. Who would have imagined ten years ago, for instance, that e-mail and instant messaging would become a dominant form of business communication and that many managers would be inundated with more than 200 e-mail messages each day (Walker, 2004)?

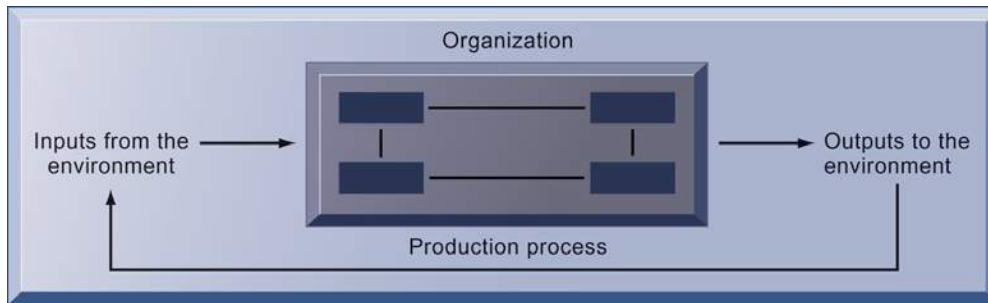
## WHAT IS AN ORGANIZATION?

An **organization** is a stable, formal social structure that takes resources from the environment and processes them to produce outputs. This technical definition focuses on three elements of an organization. Capital and labor are primary production factors provided by the environment. The organization (the firm) transforms these inputs into products and services in a production function. The products and services are consumed by environments in return for supply inputs (see Figure 3-2).

An organization is more stable than an informal group (such as a group of friends that meets every Friday for lunch) in terms of longevity and routineness. Organizations are formal legal entities with internal rules and procedures that must abide by laws. Organizations are also social structures because they are a collection of social elements, much as a machine has a structure—a particular arrangement of valves, cams, shafts, and other parts.

This definition of organizations is powerful and simple, but it is not very descriptive or even predictive of real-world organizations. A more realistic behavioral definition of an organization is that it is a collection of rights,



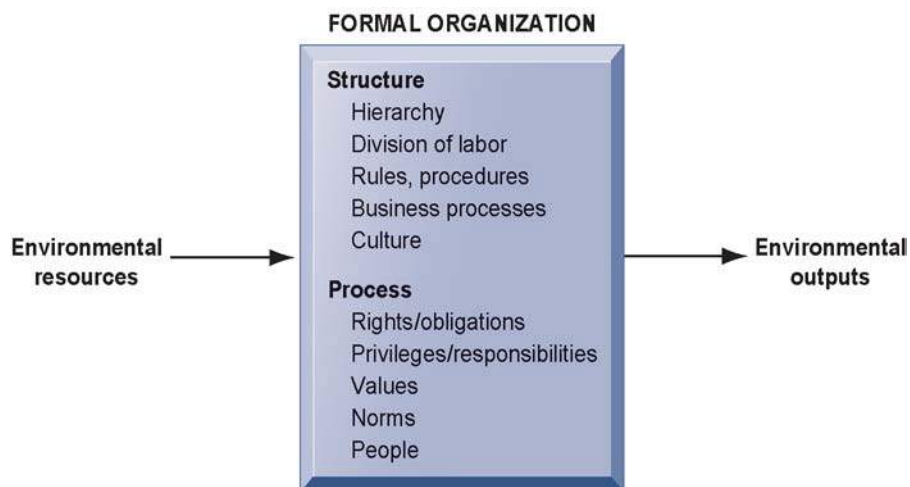
**FIGURE 3-2 THE TECHNICAL MICROECONOMIC DEFINITION OF THE ORGANIZATION**

In the microeconomic definition of organizations, capital and labor (the primary production factors provided by the environment) are transformed by the firm through the production process into products and services (outputs to the environment). The products and services are consumed by the environment, which supplies additional capital and labor as inputs in the feedback loop.

privileges, obligations, and responsibilities that is delicately balanced over a period of time through conflict and conflict resolution (see Figure 3-3).

In this behavioral view of the firm, people who work in organizations develop customary ways of working; they gain attachments to existing relationships; and they make arrangements with subordinates and superiors about how work will be done, the amount of work that will be done, and under what conditions work will be done. Most of these arrangements and feelings are not discussed in any formal rulebook.

How do these definitions of organizations relate to information systems technology? A technical view of organizations encourages us to focus on how inputs are combined to create outputs when technology changes are introduced into the company. The firm is seen as infinitely malleable, with capital and labor substituting for each other quite easily. But the more realistic behavioral

**FIGURE 3-3 THE BEHAVIORAL VIEW OF ORGANIZATIONS**

The behavioral view of organizations emphasizes group relationships, values, and structures.

definition of an organization suggests that building new information systems, or rebuilding old ones, involves much more than a technical rearrangement of machines or workers—that some information systems change the organizational balance of rights, privileges, obligations, responsibilities, and feelings that have been established over a long period of time.

Changing these elements can take a long time, be very disruptive, and require more resources to support training and learning. For instance, the length of time required to implement effectively a new information system is much longer than usually anticipated simply because there is a lag between implementing a technical system and teaching employees and managers how to use the system.

Technological change requires changes in who owns and controls information; who has the right to access and update that information; and who makes decisions about whom, when, and how. This more complex view forces us to look at the way work is designed and the procedures used to achieve outputs.

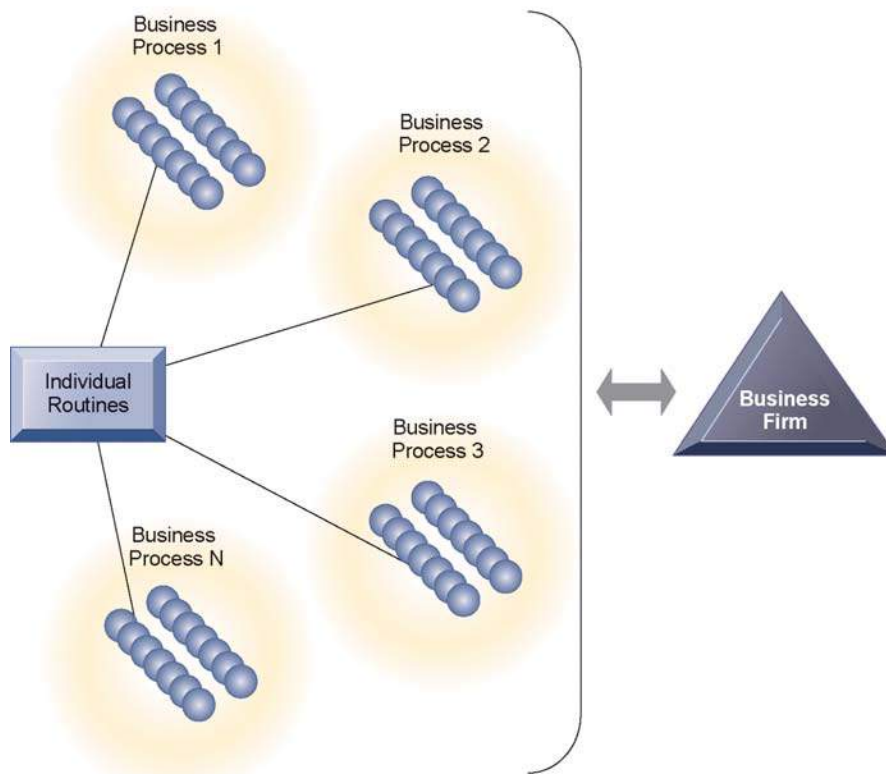
The technical and behavioral definitions of organizations are not contradictory. Indeed, they complement each other: The technical definition tells us how thousands of firms in competitive markets combine capital, labor, and information technology, whereas the behavioral model takes us inside the individual firm to see how that technology affects the organization's inner workings. Section 3.2 describes how each of these definitions of organizations can help explain the relationships between information systems and organizations.

## FEATURES OF ORGANIZATIONS

All modern organizations have certain characteristics. They are bureaucracies with clear-cut divisions of labor and specialization. Organizations arrange specialists in a hierarchy of authority in which everyone is accountable to someone and authority is limited to specific actions governed by abstract rules or procedures. These rules create a system of impartial and universal decision making. Organizations try to hire and promote employees on the basis of technical qualifications and professionalism (not personal connections). The organization is devoted to the principle of efficiency: maximizing output using limited inputs. Other features of organizations include their business processes, organizational culture, organizational politics, surrounding environments, structure, goals, constituencies, and leadership styles. All of these features affect the kinds of information systems used by organizations.

### Routines and Business Processes

All organizations, including business firms, become very efficient over time because individuals in the firm develop **routines** for producing goods and services. Routines—sometimes called *standard operating procedures*—are precise rules, procedures, and practices that have been developed to cope with virtually all expected situations. As employees learn these routines, they become highly productive and efficient, and the firm is able to reduce its costs over time as efficiency increases. For instance, when you visit a doctor's office, receptionists have a well-developed set of routines for gathering basic information from you; nurses have a different set of routines for preparing you for an interview with a doctor; and the doctor has a well-developed set of routines for diagnosing you. *Business processes*, which we introduced in Chapters 1 and 2, are collections of such routines. A business firm in turn is a collection of business processes (Figure 3-4).

**FIGURE 3-4** ROUTINES, BUSINESS PROCESSES, AND FIRMS

All organizations are composed of individual routines and behaviors, a collection of which make up a business process. A collection of business processes make up the business firm. New information system applications require that individual routines and business processes change to achieve high levels of organizational performance.

### Organizational Politics

People in organizations occupy different positions with different specialties, concerns, and perspectives. As a result, they naturally have divergent viewpoints about how resources, rewards, and punishments should be distributed. These differences matter to both managers and employees, and they result in political struggle for resources, competition, and conflict within every organization. Political resistance is one of the great difficulties of bringing about organizational change, especially the development of new information systems. Virtually all large information systems investments by a firm that bring about significant changes in strategy, business objectives, business processes, and procedures become politically charged events. Managers that know how to work with the politics of an organization will be more successful than less-skilled managers in implementing new information systems. Throughout this book you will find many examples of where internal politics defeated the best-laid plans for an information system.

### Organizational Culture

All organizations have bedrock, unassailable, unquestioned (by the members) assumptions that define their goals and products. Organizational culture encompasses this set of assumptions about what products the organization



should produce, how it should produce them, where, and for whom. Generally, these cultural assumptions are taken totally for granted and are rarely publicly announced or spoken about. Business processes—the actual way business firms produce value—are usually ensconced in the organization's culture.

You can see organizational culture at work by looking around your university or college. Some bedrock assumptions of university life are that professors know more than students, the reason students attend college is to learn, and classes follow a regular schedule. Organizational culture is a powerful unifying force that restrains political conflict and promotes common understanding, agreement on procedures, and common practices. If we all share the same basic cultural assumptions, agreement on other matters is more likely.

At the same time, organizational culture is a powerful restraint on change, especially technological change (review the chapter-opening case). Most organizations will do almost anything to avoid making changes in basic assumptions. Any technological change that threatens commonly held cultural assumptions usually meets a great deal of resistance. However, there are times when the only sensible way for a firm to move forward is to employ a new technology that directly opposes an existing organizational culture. When this occurs, the technology is often stalled while the culture slowly adjusts.

## Organizational Environments

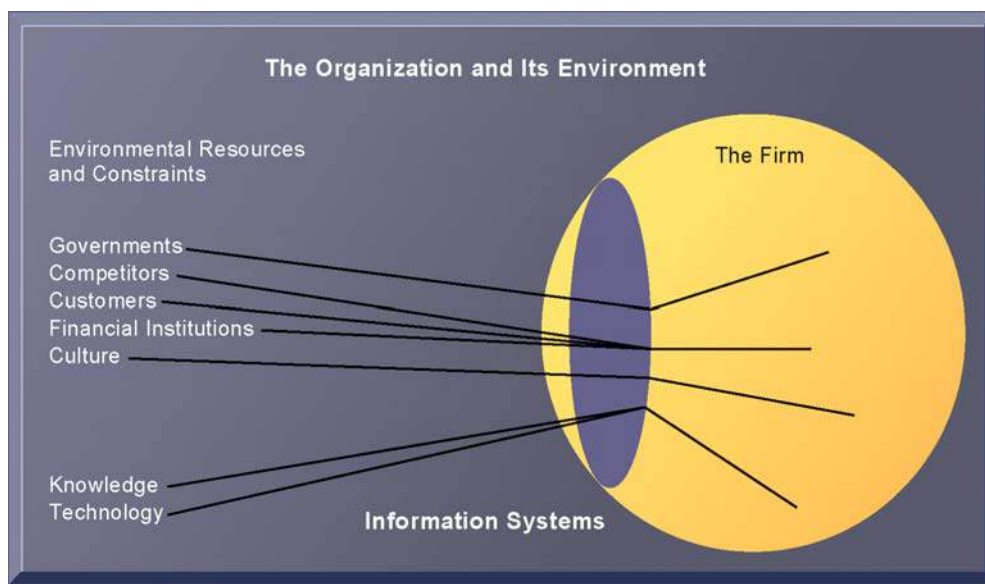
Organizations reside in environments from which they draw resources and to which they supply goods and services. Organizations and environments have a reciprocal relationship. On the one hand, organizations are open to, and dependent on, the social and physical environment that surrounds them. Without financial and human resources—people willing to work reliably and consistently for a set wage or revenue from customers—organizations could not exist. Organizations must respond to legislative and other requirements imposed by government, as well as the actions of customers and competitors. On the other hand, organizations can influence their environments. For example, business firms form alliances with other businesses to influence the political process; they advertise to influence customer acceptance of their products.

Figure 3-5 illustrates the role of information systems in helping organizations perceive changes in their environments and also in helping organizations act on their environments. Information systems are key instruments for *environmental scanning*, helping managers identify external changes that might require an organizational response.

Environments generally change much faster than organizations. The main reasons for organizational failure are an inability to adapt to a rapidly changing environment and a lack of resources—particularly among young firms—to sustain even short periods of troubled times. New technologies, new products, and changing public tastes and values (many of which result in new government regulations) put strains on any organization's culture, politics, and people. Most organizations do not cope well with large environmental shifts. The inertia built into an organization's standard operating procedures, the political conflict raised by changes to the existing order, and the threat to closely held cultural values typically inhibit organizations from making significant changes. It is not surprising that only 10 percent of the Fortune 500 companies in 1919 still exist today.

## Organizational Structure

Organizations all have a structure or shape. Mintzberg's classification, described in Table 3-1, identifies five basic kinds of organizational structure (Mintzberg, 1979).

**FIGURE 3-5 ENVIRONMENTS AND ORGANIZATIONS HAVE A RECIPROCAL RELATIONSHIP**

Environments shape what organizations can do, but organizations can influence their environments and decide to change environments altogether. Information technology plays a critical role in helping organizations perceive environmental change and in helping organizations act on their environment.

**TABLE 3-1 ORGANIZATIONAL STRUCTURES**

ORGANIZATIONAL TYPE	DESCRIPTION	EXAMPLES
Entrepreneurial structure	Young, small firm in a fast-changing environment. It has a simple structure and is managed by an entrepreneur serving as its single chief executive officer.	Small start-up business
Machine bureaucracy	Large bureaucracy existing in a slowly changing environment, producing standard products. It is dominated by a centralized management team and centralized decision making.	Midsized manufacturing firm
Divisionalized bureaucracy	Combination of multiple machine bureaucracies, each producing a different product or service, all topped by one central headquarters.	Fortune 500 firms, such as General Motors
Professional bureaucracy	Knowledge-based organization where goods and services depend on the expertise and knowledge of professionals. Dominated by department heads with weak centralized authority.	Law firms, school systems, hospitals
Adhocracy	Task force organization that must respond to rapidly changing environments. Consists of large groups of specialists organized into short-lived multidisciplinary teams and has weak central management.	Consulting firms, such as the Rand Corporation

The kind of information systems you find in a business firm—and the nature of problems with these systems—often reflects the type of organizational structure. For instance, in a professional bureaucracy such as a hospital, it is not unusual to find parallel patient record systems, one operated by the administration, another by doctors, and another by other professional staff such as nurses and social workers. In small entrepreneurial firms you will often find poorly designed systems developed in a rush that often outgrow their useful-

ness quickly. In huge multidivisional firms operating in hundreds of locations you will often find there is not a single integrating information system, but instead each locale or each division has its set of information systems.

### Other Organizational Features

Organizations have goals and use different means to achieve them. Some organizations have coercive goals (e.g., prisons); others have utilitarian goals (e.g., businesses). Still others have normative goals (universities, religious groups). Organizations also serve different groups or have different constituencies, some primarily benefiting their members, others benefiting clients, stockholders, or the public. The nature of leadership differs greatly from one organization to another—some organizations may be more democratic or authoritarian than others. Another way organizations differ is by the tasks they perform and the technology they use. Some organizations perform primarily routine tasks that can be reduced to formal rules that require little judgment (such as manufacturing auto parts), whereas others (such as consulting firms) work primarily with nonroutine tasks.

## 3.2 HOW INFORMATION SYSTEMS IMPACT ORGANIZATIONS AND BUSINESS FIRMS

Information systems have become integral, online, interactive tools deeply involved in the minute-to-minute operations and decision making of large organizations. Over the last decade, information systems have fundamentally altered the economics of organizations and greatly increased the possibilities for organizing work. Theories and concepts from economics and sociology help us understand the changes brought about by IT.

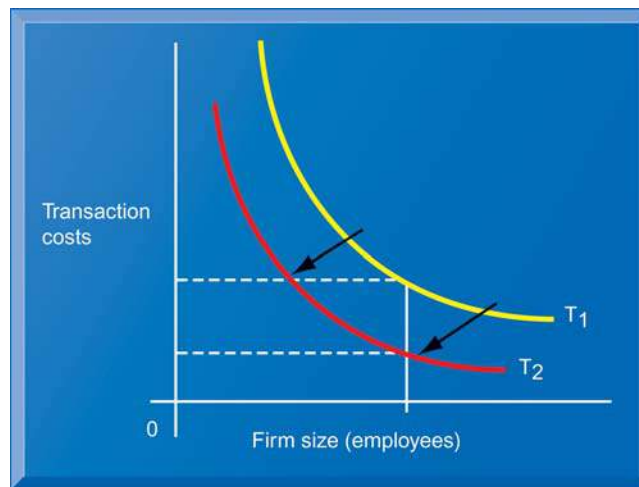
### ECONOMIC IMPACTS

From the point of view of economics, IT changes both the relative costs of capital and the costs of information. Information systems technology can be viewed as a factor of production that can be substituted for traditional capital and labor. As the cost of information technology decreases, it is substituted for labor, which historically has been a rising cost. Hence, information technology should result in a decline in the number of middle managers and clerical workers as information technology substitutes for their labor (Laudon, 1990).

As the cost of information technology decreases, it also substitutes for other forms of capital, such as buildings and machinery, which remain relatively expensive. Hence, over time we should expect managers to increase their investments in IT because of its declining cost relative to other capital investments.

IT also obviously affects the cost and quality of information and changes the economics of information. Information technology helps firms contract in size because it can reduce transaction costs—the costs incurred when a firm buys on the marketplace what it cannot make itself. According to **transaction cost theory**, firms and individuals seek to economize on transaction costs, much as they do on production costs. Using markets is expensive (Coase, 1937; Williamson, 1985) because of costs such as locating and communicating with distant suppliers, monitoring contract compliance, buying insurance, obtaining information on products, and so forth. Traditionally, firms have tried to reduce

**FIGURE 3-6 THE TRANSACTION COST THEORY OF THE IMPACT OF INFORMATION TECHNOLOGY ON THE ORGANIZATION**



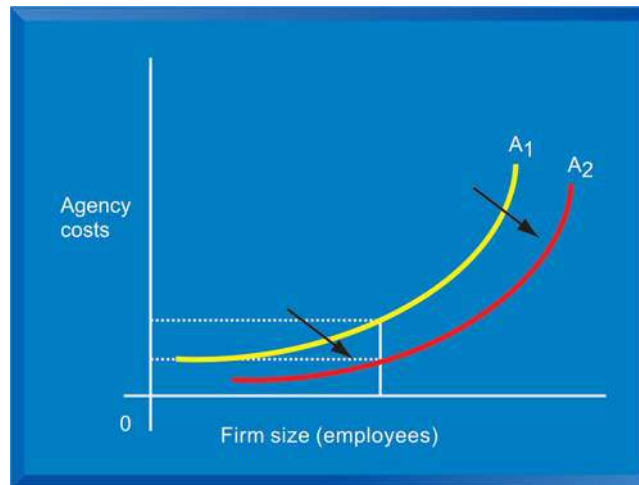
Firms traditionally grew in size to reduce transaction costs. IT potentially reduces the costs for a given size, shifting the transaction cost curve inward, opening up the possibility of revenue growth without increasing size, or even revenue growth accompanied by shrinking size.

transaction costs through vertical integration, by getting bigger, hiring more employees, and buying their own suppliers and distributors, as both General Motors and Ford used to do.

Information technology, especially the use of networks, can help firms lower the cost of market participation (transaction costs), making it worthwhile for firms to contract with external suppliers instead of using internal sources. For instance, by using computer links to external suppliers, the Chrysler Corporation can achieve economies by obtaining more than 70 percent of its parts from the outside. Information systems make it possible for companies such as Cisco Systems and Dell Computer to outsource their production to contract manufacturers such as Flextronics instead of making their products themselves.

Figure 3-6 shows that as transaction costs decrease, firm size (the number of employees) should shrink because it becomes easier and cheaper for the firm to contract for the purchase of goods and services in the marketplace rather than to make the product or offer the service itself. Firm size can stay constant or contract even if the company increases its revenues. For example, when Eastman Chemical Company split off from Kodak in 1994, it had \$3.3 billion in revenue and 24,000 full-time employees. By 2005, it generated \$7.1 billion in revenue with only 12,000 employees.

Information technology also can reduce internal management costs. According to **agency theory**, the firm is viewed as a “nexus of contracts” among self-interested individuals rather than as a unified, profit-maximizing entity (Jensen and Meckling, 1976). A principal (owner) employs “agents” (employees) to perform work on his or her behalf. However, agents need constant supervision and management; otherwise, they will tend to pursue their own interests rather than those of the owners. As firms grow in size and scope, agency costs or coordination costs rise because owners must expend more and more effort supervising and managing employees.

**FIGURE 3-7 THE AGENCY COST THEORY OF THE IMPACT OF INFORMATION TECHNOLOGY ON THE ORGANIZATION**

As firms grow in size and complexity, traditionally they experience rising agency costs. IT shifts the agency cost curve down and to the right, enabling firms to increase size while lowering agency costs.

Information technology, by reducing the costs of acquiring and analyzing information, permits organizations to reduce agency costs because it becomes easier for managers to oversee a greater number of employees. Figure 3-7 shows that by reducing overall management costs, information technology enables firms to increase revenues while shrinking the number of middle managers and clerical workers. We have seen examples in earlier chapters where information technology expanded the power and scope of small organizations by enabling them to perform coordinating activities such as processing orders or keeping track of inventory with very few clerks and managers.

## ORGANIZATIONAL AND BEHAVIORAL IMPACTS

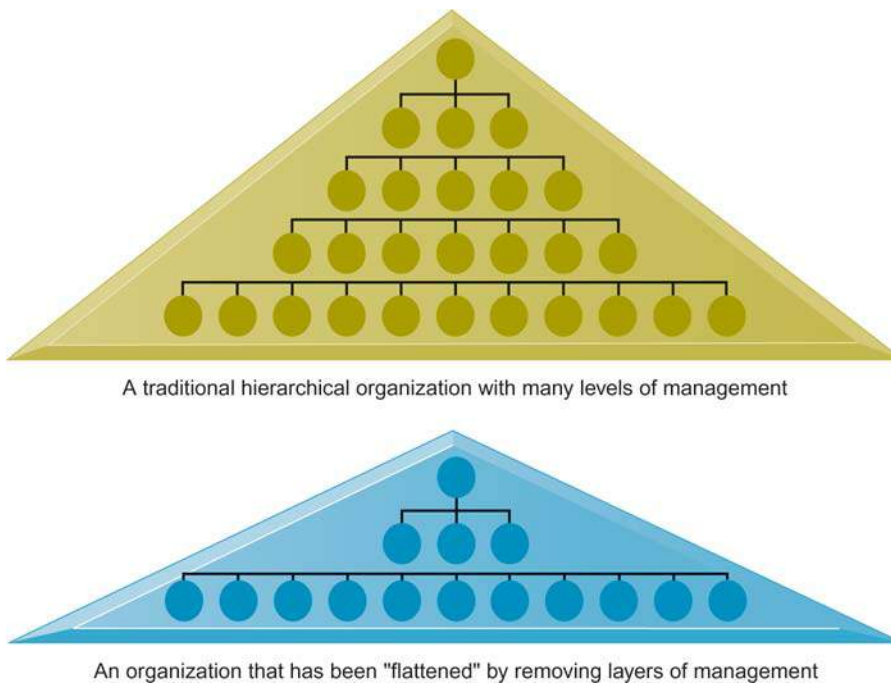
Theories based on the sociology of complex organizations also provide some understanding about how and why firms change with the implementation of new IT applications.

### IT Flattens Organizations

Large, bureaucratic organizations, which primarily developed before the computer age, are often inefficient, slow to change, and less competitive than newly created organizations. Some of these large organizations have downsized, reducing the number of employees and the number of levels in their organizational hierarchies.

Behavioral researchers have theorized that information technology facilitates flattening of hierarchies by broadening the distribution of information to empower lower-level employees and increase management efficiency (see Figure 3-8). IT pushes decision-making rights lower in the organization because lower-level employees receive the information they need to make decisions without supervision. (This empowerment is also possible because of higher educational levels among the workforce, which give employees the capabilities to make intelligent decisions.) Because managers now receive so much more



**FIGURE 3-8** FLATTENING ORGANIZATIONS

Information systems can reduce the number of levels in an organization by providing managers with information to supervise larger numbers of workers and by giving lower-level employees more decision-making authority.

accurate information on time, they become much faster at making decisions, so fewer managers are required. Management costs decline as a percentage of revenues, and the hierarchy becomes much more efficient.

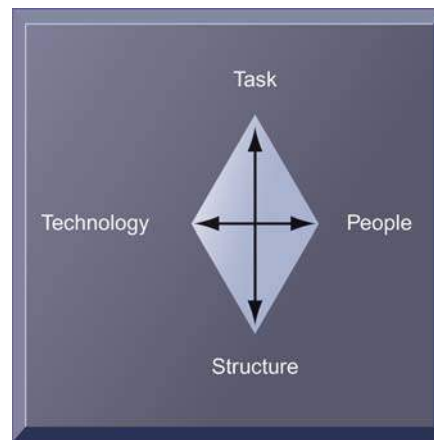
These changes mean that the management span of control has also been broadened, enabling high-level managers to manage and control more workers spread over greater distances. Many companies have eliminated thousands of middle managers as a result of these changes.

### Postindustrial Organizations

Postindustrial theories based more on history and sociology than economics also support the notion that IT should flatten hierarchies. In postindustrial societies, authority increasingly relies on knowledge and competence, and not merely on formal positions. Hence, the shape of organizations flattens because professional workers tend to be self-managing, and decision making should become more decentralized as knowledge and information become more widespread throughout the firm (Drucker, 1988).

Information technology may encourage task force–networked organizations in which groups of professionals come together—face to face or electronically—for short periods of time to accomplish a specific task (e.g., designing a new automobile); once the task is accomplished, the individuals join other task forces. The global consulting service Accenture, described in Chapter 1, is an example. It has no operational headquarters and no formal branches. Many of its 129,000 employees move from location to location to work on projects at client sites in 48 different countries.

**FIGURE 3-9 ORGANIZATIONAL RESISTANCE AND THE MUTUALLY ADJUSTING RELATIONSHIP BETWEEN TECHNOLOGY AND THE ORGANIZATION**



Implementing information systems has consequences for task arrangements, structures, and people. According to this model, to implement change, all four components must be changed simultaneously. *Source: Leavitt (1965).*

Who makes sure that self-managed teams do not head off in the wrong direction? Who decides which person works on which team and for how long? How can managers evaluate the performance of someone who is constantly rotating from team to team? How do people know where their careers are headed? New approaches for evaluating, organizing, and informing workers are required, and not all companies can make virtual work effective.

### Understanding Organizational Resistance to Change

Information systems inevitably become bound up in organizational politics because they influence access to a key resource—namely, information. Information systems can affect who does what to whom, when, where, and how in an organization. Many new information systems require changes in personal, individual routines that can be painful for those involved and require retraining and additional effort that may or may not be compensated. Because information systems potentially change an organization's structure, culture, business processes, and strategy, there is often considerable resistance to them when they are introduced.

There are several ways to visualize organizational resistance. Leavitt (1965) used a diamond shape to illustrate the interrelated and mutually adjusting character of technology and organization (see Figure 3-9). Here, changes in technology are absorbed, deflected, and defeated by organizational task arrangements, structures, and people. In this model, the only way to bring about change is to change the technology, tasks, structure, and people simultaneously. Other authors have spoken about the need to “unfreeze” organizations before introducing an innovation, quickly implementing it, and “refreezing” or institutionalizing the change (Alter and Ginzberg, 1978; Kolb, 1970).

Because organizational resistance to change is so powerful, many information technology investments flounder and do not increase productivity. Indeed, research on project implementation failures demonstrates that the most common reason for failure of large projects to reach their objectives is not the failure of the technology, but organizational and political resistance to change.

Chapter 14 treats this issue in detail. Therefore, as a manager involved in future IT investments, your ability to work with people and organizations is just as important as your technical awareness and knowledge.

## THE INTERNET AND ORGANIZATIONS

The Internet, especially the World Wide Web, is beginning to have an important impact on the relationships between firms and external entities, and even on the organization of business processes inside a firm. The Internet increases the accessibility, storage, and distribution of information and knowledge for organizations. In essence, the Internet is capable of dramatically lowering the transaction and agency costs facing most organizations. For instance, brokerage firms and banks in New York can now deliver their internal operations procedures manuals to their employees at distant locations by posting them on the corporate Web site, saving millions of dollars in distribution costs. A global sales force can receive nearly instant price product information updates using the Web or instructions from management sent by e-mail. Vendors of some large retailers can access retailers' internal Web sites directly to find up-to-the-minute sales information and to initiate replenishment orders instantly.

Businesses are rapidly rebuilding some of their key business processes based on Internet technology and making this technology a key component of their IT infrastructures. If prior networking is any guide, one result will be simpler business processes, fewer employees, and much flatter organizations than in the past.

## IMPLICATIONS FOR THE DESIGN AND UNDERSTANDING OF INFORMATION SYSTEMS

To deliver genuine benefits, information systems must be built with a clear understanding of the organization in which they will be used. In our experience, the central organizational factors to consider when planning a new system are the following:

- The environment in which the organization must function
- The structure of the organization: hierarchy, specialization, routines, and business processes
- The organization's culture and politics
- The type of organization and its style of leadership
- The principal interest groups affected by the system and the attitudes of workers who will be using the system
- The kinds of tasks, decisions, and business processes that the information system is designed to assist

### 3.3 USING INFORMATION SYSTEMS TO ACHIEVE COMPETITIVE ADVANTAGE

In almost every industry you examine, you will find that some firms do better than most others. There's almost always a stand-out firm. In the automotive industry, Toyota is considered a superior performer. In pure online retail, Amazon.com is the leader. In off-line retail Wal-Mart, the largest retailer on

earth, is the leader. In online music, Apple's iTunes is considered the leader with more than 75 percent of the downloaded music market, and in the related industry of digital music players, the iPod is the leader. In Web search, Google is considered the leader.

Firms that “do better” than others are said to have a competitive advantage over others: They either have access to special resources that others do not, or they are able to use commonly available resources more efficiently—usually because of superior knowledge and information assets. In any event, they do better in terms of revenue growth, profitability, or productivity growth (efficiency), all of which ultimately in the long run translate into higher stock market valuations than their competitors.

But why do some firms do better than others and how do they achieve competitive advantage? How can you analyze a business and identify its strategic advantages? How can you develop a strategic advantage for your own business? And how do information systems contribute to strategic advantages? One answer to that question is Michael Porter's competitive forces model.

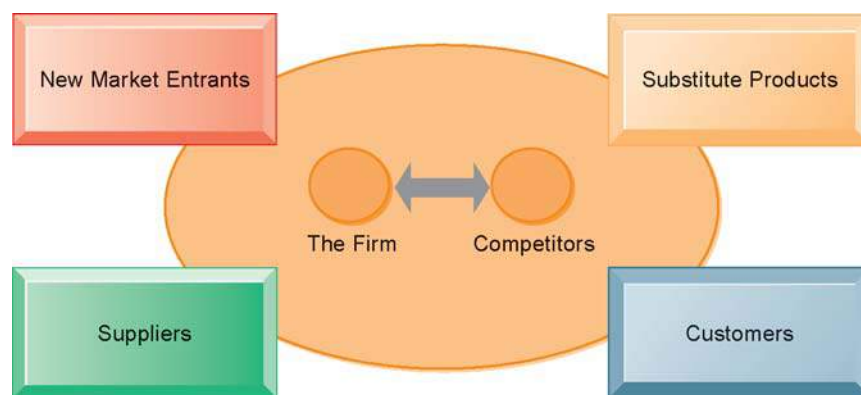
## PORTER'S COMPETITIVE FORCES MODEL

Arguably, the most widely used model for understanding competitive advantage is Michael Porter's **competitive forces model** (See Figure 3-10). This model provides a general view of the firm, its competitors, and the firm's environment. Earlier in this chapter, we described the importance of a firm's environment and the dependence of firms on environments. Porter's model is all about the firm's general business environment. In this model, five competitive forces shape the fate of the firm.

### Traditional Competitors

All firms share market space with other competitors who are continuously devising new, more efficient ways to produce by introducing new products and services, and attempting to attract customers by developing their brands and imposing switching costs on their customers.

**FIGURE 3-10 PORTER'S COMPETITIVE FORCES MODEL**



In Porter's competitive forces model, the strategic position of the firm and its strategies are determined not only by competition with its traditional direct competitors but also by four forces in the industry's environment: new market entrants, substitute products, customers, and suppliers.

## New Market Entrants

In a free economy with mobile labor and financial resources, new companies are always entering the marketplace. In some industries, there are very low barriers to entry, whereas in other industries, entry is very difficult. For instance, it is fairly easy to start a pizza business or just about any small retail business, but it is much more expensive and difficult to enter the computer chip business, which has very high capital costs and requires significant expertise and knowledge that is hard to obtain. New companies have several possible advantages: They are not locked into old plants and equipment, they often hire younger workers who are less expensive and perhaps more innovative, they are not encumbered by old, worn-out brand names, and they are “more hungry” (more highly motivated) than traditional occupants of an industry. These advantages are also their weakness: They depend on outside financing for new plants and equipment, which can be expensive; they have a less experienced workforce; and they have little brand recognition.

## Substitute Products and Services

In just about every industry, there are substitutes that your customers might use if your prices become too high. New technologies create new substitutes all the time. Even oil has substitutes: Ethanol can substitute for gasoline in cars; vegetable oil for diesel fuel in trucks; and wind, solar, coal, and hydro power for industrial electricity generation. Likewise, Internet telephone service can substitute for traditional telephone service, and fiber-optic telephone lines to the home can substitute for cable TV lines. And, of course, an Internet music service that allows you to download music tracks to an iPod is a substitute for CD-based music stores. The more substitute products and services in your industry, the less you can control pricing and the lower your profit margins.

## Customers

A profitable company depends in large measure on its ability to attract and retain customers (while denying them to competitors), and charge high prices. The power of customers grows if they can easily switch to a competitor's products and services, or if they can force a business and its competitors to compete on price alone in a transparent marketplace where there is little **product differentiation**, and all prices are known instantly (such as on the Internet). For instance, in the used college textbook market on the Internet, students (customers) can find multiple suppliers of just about any current college textbook. In this case, online customers have extraordinary power over used-book firms.

## Suppliers

The market power of suppliers can have a significant impact on firm profits, especially when the firm cannot raise prices as fast as can suppliers. The more different suppliers a firm has, the greater control it can exercise over suppliers in terms of price, quality, and delivery schedules. For instance, manufacturers of laptop PCs almost always have multiple competing suppliers of key components, such as keyboards, hard drives, and display screens.

## INFORMATION SYSTEM STRATEGIES FOR DEALING WITH COMPETITIVE FORCES

What is a firm to do when it is faced with all these competitive forces? And how can the firm use information systems to counteract some of these forces?



Wal-Mart's continuous inventory replenishment system uses sales data captured at the checkout counter to transmit orders to restock merchandise directly to its suppliers. The system enables Wal-Mart to keep costs low while fine-tuning its merchandise to meet customer demands.



How do you prevent substitutes and inhibit new market entrants? There are four generic strategies, each of which often is enabled by using information technology and systems: low-cost leadership, product differentiation, focus on market niche, and strengthening customer and supplier intimacy.

### Low-Cost Leadership

Use information systems to achieve the lowest operational costs and the lowest prices. The classic example is Wal-Mart. By keeping prices low and shelves well stocked using a legendary inventory replenishment system, Wal-Mart became the leading retail business in the United States. Wal-Mart's continuous replenishment system sends orders for new merchandise directly to suppliers as soon as consumers pay for their purchases at the cash register. Point-of-sale terminals record the bar code of each item passing the checkout counter and send a purchase transaction directly to a central computer at Wal-Mart headquarters. The computer collects the orders from all Wal-Mart stores and transmits them to suppliers. Suppliers can also access Wal-Mart's sales and inventory data using Web technology.

Because the system replenishes inventory with lightning speed, Wal-Mart does not need to spend much money on maintaining large inventories of goods in its own warehouses. The system also enables Wal-Mart to adjust purchases of store items to meet customer demands. Competitors, such as Sears, have been spending 24.9 percent of sales on overhead. But by using systems to keep operating costs low, Wal-Mart pays only 16.6 percent of sales revenue for overhead. (Operating costs average 20.7 percent of sales in the retail industry.)

Wal-Mart's continuous replenishment system is also an example of an efficient customer response system. An **efficient customer response system** directly links consumer behavior to distribution and production and supply chains. Wal-Mart's continuous replenishment system provides such an efficient customer response. Dell Computer Corporation's assemble-to-order system, described in the following discussion, is another example of an efficient customer response system.

## Product Differentiation

Use information systems to enable new products and services, or greatly change the customer convenience in using your existing products and services. For instance, Google continuously introduces new and unique search services on its Web site, such as Google Maps. By purchasing PayPal, an electronic payment system, in 2003, eBay made it much easier for customers to pay sellers and expanded use of its auction marketplace. Apple created iPod, a unique portable digital music player, plus a unique online Web music service where songs can be purchased for 99 cents. Continuing to innovate, Apple recently introduced a portable iPod video player.

Manufacturers and retailers are using information systems to create products and services that are customized and personalized to fit the precise specifications of individual customers. Dell Computer Corporation sells directly to customers using assemble-to-order manufacturing. Individuals, businesses, and government agencies can buy computers directly from Dell, customized with the exact features and components they need. They can place their orders directly using a toll-free telephone number or by accessing Dell's Web site. Once Dell's production control receives an order, it directs an assembly plant to assemble the computer using components from an on-site warehouse based on the configuration specified by the customer.

Lands' End customers can use its Web site to order jeans, dress pants, chino pants, and shirts custom-tailored to their own specifications. Customers enter their measurements into a form on the Web site, which then transmits each customer's specifications over a network to a computer that develops an electronic made-to-measure pattern for that customer. The individual patterns are then transmitted electronically to a manufacturing plant, where they are used to drive fabric-cutting equipment. There are almost no extra production costs because the process does not require additional warehousing, production overruns, and inventories, and the cost to the customer is only slightly higher than that of a mass-produced garment. Fourteen percent of Lands' End shirt and pants sales are now customized. This ability to offer individually tailored products or services using the same production resources as mass production is called **mass customization**.

Table 3-2 lists a number of companies that have developed IS-based products and services that other firms have found difficult to copy, or at least took a long time to copy.

**TABLE 3-2 IS-ENABLED NEW PRODUCTS AND SERVICES PROVIDING COMPETITIVE ADVANTAGE**

Amazon.com: One-click shopping	Amazon holds a patent on one-click shopping that it licenses to other online retailers.
Online music: Apple iPod and iTunes	An integrated handheld player backed up with an online library of two million songs; one billion songs downloaded so far.
Search engine advertising: Google	Online search engine integrated with online advertising using text ads; two billion searches per month; Google holds several patents on its PageRank method of search response.
Golf club customization: Ping	Customers can select from more than one million different golf club options; a build-to-order system ships their customized clubs within 48 hours.
Online bill payment: CheckFree.com	Forty million households pay their bills online, as of 2006.
Online person-to-person payment: PayPal.com	Enables transfer of money between individual bank accounts and between bank accounts and credit card accounts.

Information systems make it possible for Ping Inc. to offer customers more than one million custom golf club options with different combinations of club heads, grips, shafts, and lie angles. Ping is able to fill many orders within 48 hours.



### Focus on Market Niche

Use information systems to enable a specific market focus, and serve this narrow target market better than competitors. Information systems support this strategy by producing and analyzing data for finely tuned sales and marketing techniques. Information systems enable companies to analyze customer buying patterns, tastes, and preferences closely so that they efficiently pitch advertising and marketing campaigns to smaller and smaller target markets.

The data come from a range of sources—credit card transactions, demographic data, purchase data from checkout counter scanners at supermarkets and retail stores, and data collected when people access and interact with Web sites. Sophisticated software tools find patterns in these large pools of data and infer rules from them to guide decision making. Analysis of such data drives one-to-one marketing that creates personal messages based on individualized preferences. Contemporary customer relationship management (CRM) systems feature analytical capabilities for this type of intensive data analysis (see Chapters 9 and 12).

Hilton Hotels uses a customer information system called OnQ, which contains detailed data about active guests in every property across the eight hotel brands owned by Hilton. Employees at the front desk tapping into the system instantly search through 180 million records to find out the preferences of customers checking in and their past experiences with Hilton so they can give these guests exactly what they want. OnQ establishes the value of each customer to Hilton, based on personal history and on predictions about the value of that person's future business with Hilton. OnQ can also identify customers who are clearly not profitable. Profitable customers receive extra privileges and attention, such as the ability to check out late without paying additional fees. After Hilton started using the system, the rate of staying at Hilton Hotels rather than at competing hotels soared from 41 percent to 61 percent (Kontzer, 2004).

The Interactive Session on Technology shows how 7-Eleven improved its competitive position by wringing more value out of its customer data. This company's early growth and strategy had been based on face-to-face relationships with its customers and intimate knowledge of exactly what they wanted to purchase. As the company grew over time, it was no longer



## INTERACTIVE SESSION: TECHNOLOGY

### 7-ELEVEN STORES ASK THE CUSTOMER BY ASKING THE DATA

There is probably a 7-Eleven store in your neighborhood, and it's a convenient place for picking up a can of Coke or a quick ham-and-cheese sandwich. It's the largest convenience retailer in the world and the number one convenience store chain in the United States, with 5,300 stores.

This company started out about 75 years ago as an ice-dock operator. When refrigerators started replacing iceboxes, the manager of each store asked customers one-by-one what items they'd like to stock in their new appliances. By asking customers directly and stocking only the items customers most wanted, the company grew and prospered.

Over time, the company moved away from its roots, losing touch with customers along the way. It had no means of knowing what sold in each store and allowed vendors to decide what to stock on its shelves. Although large vendors, such as Coca-Cola and Frito-Lay, had powerful information systems for analyzing what they sold in individual stores, other vendors didn't have such systems. Moreover, the vendors' systems were designed to maximize opportunities for their businesses, not for 7-Eleven.

7-Eleven stores are not all alike. What their customers want depends a great deal on the neighborhood and region of the country where they are located. What sells well in Boston may not work in Texas.

Without detailed knowledge of its customer and sales patterns, 7-Eleven was unable to determine which items were selling well, or which items were most profitable to sell in the first place. This made a difference to the company's bottom line because of missed sales opportunities, lower profits, and excess store inventory, some of which consisted of perishable goods that had a very short shelf life. Profit margins are very thin in the convenience store business, so a quarter-point increase in sales volume can spell the difference between success and failure.

In 2004, 7-Eleven installed Hewlett-Packard servers and networking switches in all its U.S. stores to implement a Retail Information System. This system collects data from point-of-sale terminals in every store about each purchase made daily by its six million U.S. customers and transmits the information in real time to a 7-terabyte Oracle database operated by Electronic Data Systems (EDS).

With this database, 7-Eleven keeps track of its purchase transactions and analyzes them to amass information about customer demand, pricing, and interest in new products, such as the Diet Pepsi Slurpee. Analysis of the data shows which items are selling well in which stores, which items customers are most interested in, seasonal demand for items, and which items are most profitable to sell in the first place.

Management uses this information to identify sales trends, improve product assortment, eliminate slow-moving products from inventory, and increase same-store sales by stocking products that are high in demand. Insights gleaned from the data also help 7-Eleven develop new products such as its fresh-food offerings that attract new customers and increase transaction size.

The system provides store managers with information on daily, weekly, and monthly sales of each item to help them determine which items to order and the exact quantities they will need for their stores. Managers use this information plus their on-the-spot knowledge of the neighborhood to make final ordering decisions.

Store managers enter orders into workstations or handheld computers by 10 A.M. each day. The system consolidates these orders and transmits them to 7-Eleven's suppliers. Orders are consolidated four times daily, one for each U.S. time zone in which 7-Eleven stores operate. 7-Eleven's orders for fresh food items are aggregated at 7-Eleven headquarters and transmitted to fresh food suppliers and bakeries for preparation and delivery the next day.

Thanks to information technology, 7-Eleven has come full circle in its ability to respond to the needs of the customer. By tracking and analyzing its data, it knows its customers as intimately as it did when store owners talked to each customer face-to-face. According to 7-Eleven President and CEO James Keyes, "Now we can use technology as a surrogate for being able to talk to every customer who walks in the door."

**Sources:** Oracle Corporation, "Streamlining Convenience," 2006 Shared Strategy Study and "7-Eleven Inc.," [www.oracle.com](http://www.oracle.com), accessed July 15, 2006; Christopher Koch, "Who's Mining the Store?" *CIO*, May 15, 2005; James Keyes, "Data on the Fly," *Baseline*, August 2005; Laurie Sullivan, "Fine-Tuned Pricing," *Information Week*, August 15/22, 2005; and Steven Marlin, "The 24-Hour Supply Chain," *InformationWeek*, January 26, 2004.

## CASE STUDY QUESTIONS

## MIS IN ACTION

1. Why is knowing about the customer so important to a company such as 7-Eleven?
2. What are the benefits of 7-Eleven's Retail Information System?
3. In terms of Porter's model, what strategic forces does the Retail Information System seek to address?
4. Which of the strategies described in the chapter does the Retail Information System support?

Visit a nearby 7-Eleven store. Observe the items available for sale and the sales process at the store.

1. What technologies does the store use to process a purchase? Do you see any other technologies being used at the store?
2. Do you think the selection of items for sale is appropriate for the neighborhood and location of the particular 7-Eleven store you are visiting? What items might the Retail Information System have suggested for this store? Do you see any items that appear to be selling poorly at this store?
3. How well do you think 7-Eleven's Retail Information System works in stocking items for this store?

7-Eleven stores use a point-of-sale system to capture data about customer purchases and analyzes them to learn more about customer preferences and sales trends.



able to discern customer preferences through personal face-to-face relationships. A new information system helped it obtain intimate knowledge of its customers once again by gathering and analyzing customer purchase transactions.

### Strengthen Customer and Supplier Intimacy

Use information systems to tighten linkages with suppliers and develop intimacy with customers. Chrysler Corporation uses information systems to facilitate direct access from suppliers to production schedules, and even permits suppliers to decide how and when to ship suppliers to Chrysler factories. This



**TABLE 3-3 FOUR BASIC COMPETITIVE STRATEGIES**

STRATEGY	DESCRIPTION	EXAMPLE
Low-cost leadership	Use information systems to produce products and services at a lower price than competitors while enhancing quality and level of service.	Wal-Mart Dell Computer
Product differentiation	Use information systems to differentiate products, and enable new services and products.	Google, eBay, Apple, Lands' End
Focus on market niche	Use information systems to enable a focused strategy on a single market niche; specialize.	Hilton Hotels Harrah's
Customer and supplier intimacy	Use information systems to develop strong ties and loyalty with customers and suppliers.	Chrysler Corporation Amazon.com

allows suppliers more lead time in producing goods. On the customer side, Amazon.com keeps track of user preferences for book and CD purchases, and can recommend titles purchased by others to its customers. Strong linkages to customers and suppliers increase **switching costs** (the cost of switching from one product to a competing product), and loyalty to your firm. Table 3-3 summarizes the competitive strategies we have just described.

Some companies focus on one of these strategies, but you will often see companies pursuing several of them simultaneously. For example, Dell Computer tries to emphasize low cost as well as the ability to customize its personal computers. The new US Airways, described in the chapter-opening case, is trying to compete with quality of services as well as low cost.

## THE INTERNET'S IMPACT ON COMPETITIVE ADVANTAGE

The Internet has nearly destroyed some industries and has severely threatened more. The Internet has also created entirely new markets and formed the basis for thousands of new businesses. The first wave of e-commerce transformed the business world of books, music, and air travel. In the second wave, eight new industries are facing a similar transformation scenario: telephone services, movies, television, jewelry, real estate, hotels, bill payments, and software. The breadth of e-commerce offerings grows, especially in travel, information clearinghouses, entertainment, retail apparel, appliances, and home furnishings.

For instance, the printed encyclopedia industry and the travel agency industry have been nearly decimated by the availability of substitutes over the Internet. Likewise, the Internet has had a significant impact on the retail, music, book, brokerage, and newspaper industries. At the same time, the Internet has enabled new products and services, new business models, and new industries to spring up every day, from eBay and Amazon.com to iTunes and Google. In this sense, the Internet is "transforming" entire industries, forcing firms to change how they do business.

Because of the Internet, the traditional competitive forces are still at work, but competitive rivalry has become much more intense (Porter, 2001). Internet technology is based on universal standards that any company can use, making it easy for rivals to compete on price alone and for new competitors to enter the market. Because information is available to everyone, the Internet raises the bargaining power of customers, who can quickly find the lowest-cost provider

**TABLE 3-4 IMPACT OF THE INTERNET ON COMPETITIVE FORCES AND INDUSTRY STRUCTURE**

COMPETITIVE FORCE	IMPACT OF THE INTERNET
Substitute products or services	Enables new substitutes to emerge with new approaches to meeting needs and performing functions.
Customers' bargaining power	Availability of global price and product information shifts; bargaining power to customers.
Suppliers' bargaining power	Procurement over the Internet tends to raise bargaining power over suppliers; suppliers can also benefit from reduced barriers to entry and from the elimination of distributors and other intermediaries standing between them and their users.
Threat of new entrants	The Internet reduces barriers to entry, such as the need for a sales force, access to channels, and physical assets; it provides a technology for driving business processes that makes other things easier to do.
Positioning and rivalry among existing competitors	Widens the geographic market, increasing the number of competitors, and reducing differences among competitors; makes it more difficult to sustain operational advantages; puts pressure to compete on price.

on the Web. Profits have been dampened. Some industries, such as the travel industry and the financial services industry, have been more impacted than others. Table 3-4 summarizes some of the potentially negative impacts of the Internet on business firms identified by Porter.

However, contrary to Porter's somewhat negative assessment, the Internet also creates new opportunities for building brands and building very large and loyal customer bases that are willing to pay a premium for the brand, for example, Yahoo!, eBay, BlueNile, RedEnvelope, Overstock.com, Amazon.com, Google, and many others. In addition, as with all IT-enabled business initiatives, some firms are far better at using the Internet than other firms are, which creates new strategic opportunities for the successful firms.

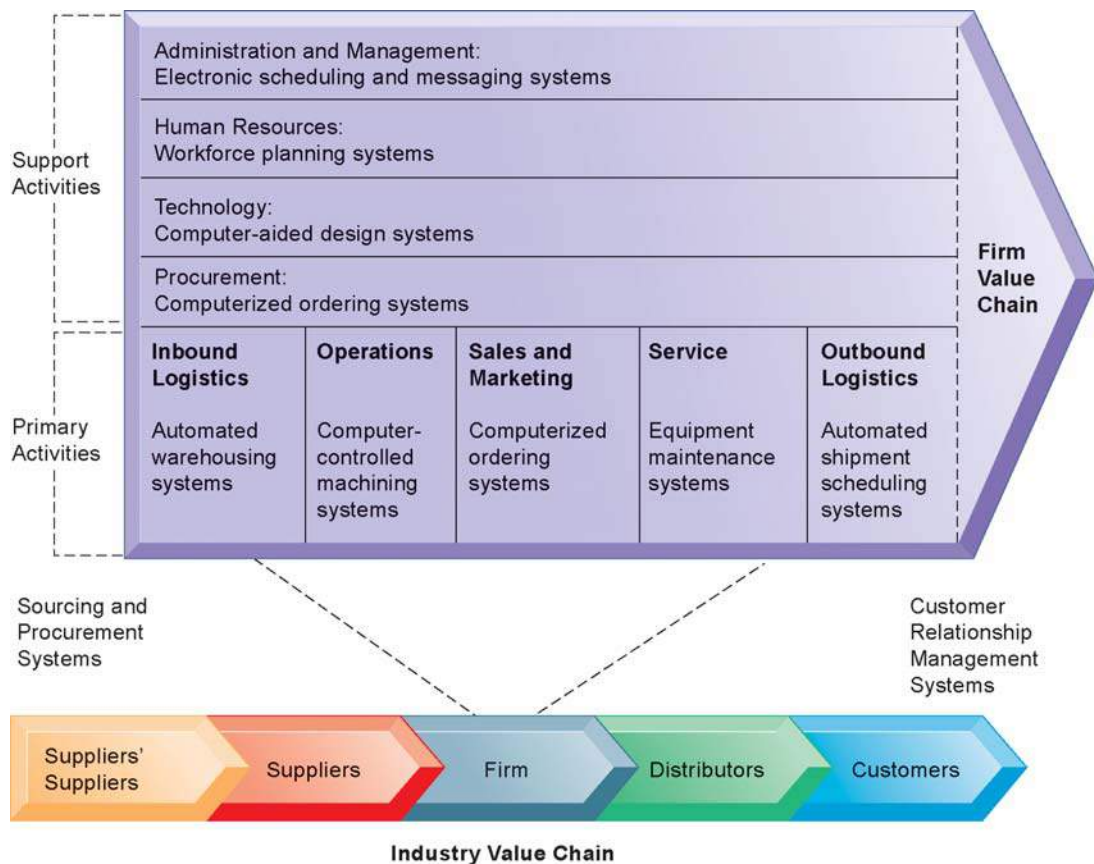
## THE BUSINESS VALUE CHAIN MODEL

Although the Porter model is very helpful for identifying competitive forces and suggesting generic strategies, it is not very specific about what exactly to do, and it does not provide a methodology to follow for achieving competitive advantages. If your goal is to achieve operational excellence, where do you start? Here's where the business value chain model is helpful.

The **value chain model** highlights specific activities in the business where competitive strategies can best be applied (Porter, 1985) and where information systems are most likely to have a strategic impact. This model identifies specific, critical-leverage points where a firm can use information technology most effectively to enhance its competitive position. The value chain model views the firm as a series or chain of basic activities that add a margin of value to a firm's products or services. These activities can be categorized as either primary activities or support activities (see Figure 3-11).

**Primary activities** are most directly related to the production and distribution of the firm's products and services, which create value for the customer. Primary activities include inbound logistics, operations, outbound logistics, sales and marketing, and service. Inbound logistics includes receiving and storing materials for distribution to production. Operations transforms inputs into finished products. Outbound logistics entails storing and distributing finished products. Sales and marketing includes promoting and selling the firm's products. The service activity includes maintenance and repair of the firm's goods and services.

**Support activities** make the delivery of the primary activities possible and consist of organization infrastructure (administration and management), human

**FIGURE 3-11 THE VALUE CHAIN MODEL**

This figure provides examples of systems for both primary and support activities of a firm and of its value partners that can add a margin of value to a firm's products or services.

resources (employee recruiting, hiring, and training), technology (improving products and the production process), and procurement (purchasing input).

Now you can ask at each stage of the value chain, "How can we use information systems to improve operational efficiency, and improve customer and supplier intimacy?" This will force you to critically examine how you perform value-adding activities at each stage and how the business processes might be improved. You can also begin to ask how information systems can be used to improve the relationship with customers and with suppliers who lie outside the firm value chain but belong to the firm's extended value chain where they are absolutely critical to your success. Here, supply chain management systems that coordinate the flow of resources into your firm, and customer relationship management systems that coordinate your sales and support employees with customers are two of the most common system applications that result from a business value chain analysis. We discuss these enterprise applications in detail later in Chapter 9.

Using the business value chain model will also cause you to consider benchmarking your business processes against your competitors or others in related industries, and identifying industry best practices. **Benchmarking** involves comparing the efficiency and effectiveness of your business processes against strict standards and then measuring performance against those standards. Industry **best practices** are usually identified by consulting

companies, research organizations, government agencies, and industry associations as the most successful solutions or problem-solving methods for consistently and effectively achieving a business objective.

Once you have analyzed the various stages in the value chain at your business, you can come up with candidate applications of information systems. Then, once you have a list of candidate applications, you can decide which to develop first. By making improvements in your own business value chain that your competitors might miss, you can achieve competitive advantage by attaining operational excellence, lowering costs, improving profit margins, and forging a closer relationship with customers and suppliers. If your competitors are making similar improvements, then at least you will not be at a competitive disadvantage—the worst of all cases!

### Extending the Value Chain: The Value Web

Figure 3-11 shows that a firm's value chain is linked to the value chains of its suppliers, distributors, and customers. After all, the performance of most firms depends not only on what goes on inside a firm but also on how well the firm coordinates with direct and indirect suppliers, delivery firms (logistics partners, such as FedEx or UPS), and, of course, customers.

How can information systems be used to achieve strategic advantage at the industry level? By working with other firms, industry participants can use information technology to develop industry-wide standards for exchanging information or business transactions electronically, which force all market participants to subscribe to similar standards. Such efforts increase efficiency, making product substitution less likely and perhaps raising entry costs—thus discouraging new entrants. Also, industry members can build industry-wide, IT-supported consortia, symposia, and communications networks to coordinate activities concerning government agencies, foreign competition, and competing industries.

Looking at the industry value chain encourages you to think about how to use information systems to link up more efficiently with your suppliers, strategic partners, and customers. Strategic advantage derives from your ability to relate your value chain to the value chains of other partners in the process. For instance, if you are Amazon.com, you want to build systems that

- Make it easy for suppliers to display goods and open stores on the Amazon site
- Make it easy for customers to pay for goods
- Develop systems that coordinate the shipment of goods to customers
- Develop shipment tracking systems for customers

In fact this is exactly what Amazon has done to become one of the Web's most satisfying online retail shopping sites. The Interactive Session on Technology discusses how Amazon.com developed and executes this business strategy. It also shows that Amazon.com had to revise its strategy several times in order to remain competitive.

Internet technology has made it possible to create highly synchronized industry value chains called value webs. A **value web** is a collection of independent firms that use information technology to coordinate their value chains to produce a product or service for a market collectively. It is more customer driven and operates in a less linear fashion than the traditional value chain.



## INTERACTIVE SESSION: ORGANIZATIONS

### AMAZON.COM: AN INTERNET GIANT FINE-TUNES ITS STRATEGY

Amazon.com made Internet history as one of the first large-scale retail companies to sell over the Web: in 2004 it hit \$4 billion in online revenues, and by 2006 its sales guidance estimates \$10 billion in revenue. It has grown to become one of the largest Internet retailers on earth. But the real significance of Amazon for this chapter is Amazon's continuous innovation in business strategy and information systems. In fact, the two are closely connected at Amazon: its business innovations are all driven by huge investments in information systems.

In 1995, former investment banker Jeff Bezos took advantage of new business opportunities created by the Internet by setting up a Web site to sell books directly to customers online. There were three million titles in print, and any one physical bookstore could only stock a fraction of them. A "virtual" bookstore offers a much larger selection of titles. Bezos believed consumers did not need to actually "touch and feel" a book before buying it, and Amazon.com provided online synopses, tables of contents, and reviews to help with selection. Amazon.com was able to charge lower prices than physical bookstores because it maintained very little of its own inventory (relying instead on distributors) and did not have to pay for maintaining physical storefronts or a large retail sales staff.

Amazon tried to provide superior customer service through e-mail and telephone customer support, automated order confirmation, online tracking and shipping information, and the ability to pay for purchases with a single click of the mouse using credit card and personal information a customer had provided during a previous purchase. This was called "1-Click" express shopping, and it made the shopping experience even more convenient.

In 1998, Amazon started selling music, CDs, videos, and DVDs, revising its business strategy "to become the best place to buy, find, and discover any product or service available online"—the online Wal-Mart. Its offerings grew to include electronics, toys, home improvement products, video games, apparel, gourmet food, travel services, personal care, and jewelry. It also introduced Amazon.com Auctions (similar to those offered by eBay), and zShops (online storefronts for small retailers). To service these new product lines, Amazon significantly expanded its warehouse and distribu-

tion capabilities and hired large numbers of employees. These moves strained its ability to adhere to its original vision of being a "virtual" retailer with lean inventories, low head count, and significant cost savings over traditional bookstores.

In 2001 and 2002, Amazon tried to increase revenue by cutting prices, offering free shipping, and leveraging its technology infrastructure to provide e-commerce services to other businesses. Amazon's Merchants@ and Amazon Marketplace allow other businesses to fully integrate their Web sites into Amazon's site to sell their branded goods using Amazon's fulfillment and payment systems. Nordstrom, The Gap, and Target stores use Amazon to sell their goods and then pay Amazon commissions and fees. In the Amazon Marketplace program, individuals are encouraged to sell their used or new goods on Amazon's Web site even when they compete directly with Amazon's sales of the same goods. Sales by third parties now represent 25 percent of Amazon's revenues.

Amazon refined its business model further to focus more on efficient operations while maintaining a steady commitment to keeping its 49 million customers satisfied. In early 2001, Amazon closed two of its eight warehouses, laid off 15 percent of its workforce, and consolidated orders from around the country prior to shipping to reduce shipping costs. Amazon used six sigma quality measures to reduce errors in fulfillment. These measures reduced fulfillment costs from 15 percent of revenue in 2000 to 10 percent by 2003.

Amazon finally became profitable in 2003 and remains an online retailing powerhouse growing at over 60 percent a year! It continues to innovate with IT-enabled services: free unlimited two-day shipping for \$79 a year (Amazon Prime). Amazon entered the dry goods grocery business in 2006. These innovations increased its costs and reduced its profits, much to the disappointment of the stock market, which has depressed Amazon's stock from a high of \$100 in 2000 down to the mid \$20 range in 2006.

But Amazon faces powerful online retail competitors such as eBay and Yahoo! who also are very adept at using information systems to develop new products and services. Google is emerging as a competitor because so many consumers use its search engine—six billion searches are performed



each month at Google—and in the process are exposed to search engine ads. Google is expanding into other shopping services: Google Base offers free classified listings of goods for sale and Google Checkout provides an online service that stores users' financial information to facilitate purchases from participating Internet vendors. Amazon is countering with new offerings, such as a digital mapping service with street-level photographs, a grocery store for non-perishable items sold in bulk, and selling short stories online for 49 cents apiece, along with additional expenditures to improve customer convenience and the shopping experience.

Recently, the company's profits have started to drop. The question is whether Amazon can turn its leadership in e-commerce into genuine long-term success. Can Amazon keep adapting its strategy to remain profitable and powerful?

**Sources:** Mary Crane, "Child's Play? Amazon Takes On Toys," *Forbes.com*, July 5, 2006; "Amazon Adds Groceries To Its Site," *The Wall Street Journal*, June 15, 2006; Randall Stross, "Trying to Get a Read on Amazon's Books," *The New York Times*, February 12, 2006; Bob Tedeschi, "Making Several Stops at Shops Online, but Paying All at Google," *The New York Times*, July 17, 2006; *The New York Times*, February 12, 2006; Gary Rivlin, "A Retail Revolution Turns 10," *The New York Times*, July 10, 2005; and Shaheen Pasha, "Amazon Has New Stories to Tell," *CNN Money*, August 22, 2005.

## CASE STUDY QUESTIONS

1. Analyze Amazon.com using the competitive forces and value chain models. How has it responded to pressures from its competitive environment? How does it provide value to its customers?
2. Describe Amazon's evolving business strategy.
3. Why did the company change its strategy?
4. Do you think Amazon can continue to be successful? Explain your answer.

## MIS IN ACTION

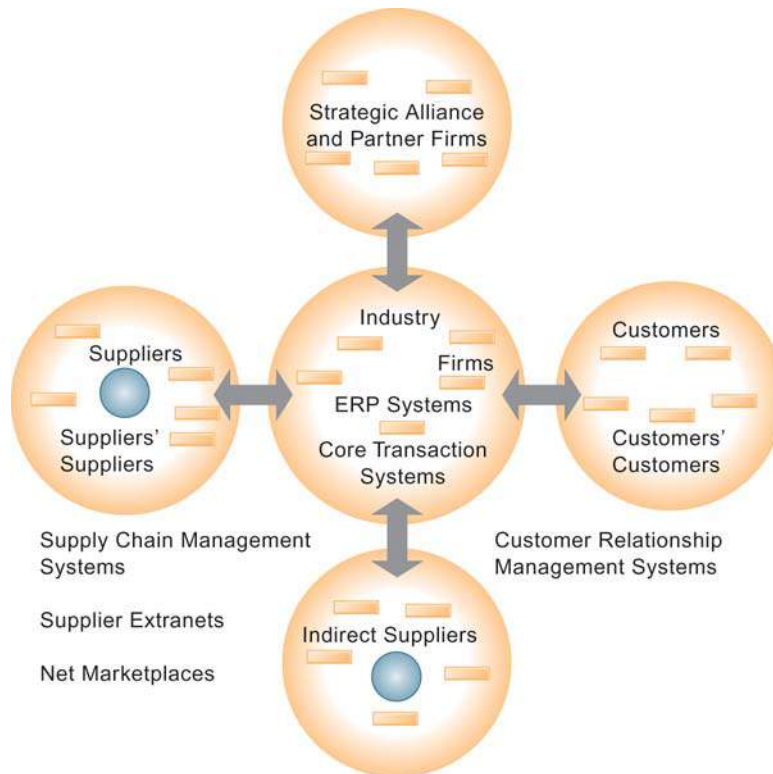
Search for an iPod nano on Amazon.com, eBay, and Yahoo! Shopping. Compare the shopping experience at these sites to answer the following questions.

1. Evaluate how each site offers information about a product, including information about the reliability of the vendor [seller].
2. Evaluate each of the sites in terms of how many sources for the product they offer.
3. Evaluate the sites in terms of pricing and availability of the product you have selected.
4. Which site would you choose for shopping for your nano? Why?

Amazon.com is an early e-commerce leader that has adjusted its strategy multiple times. It is trying to become a one-stop source for online shoppers.

The screenshot shows the Amazon.com homepage with the following elements:

- Header:** Amazon.com logo, navigation links (Your Store, See All 34 Product Categories, Your Account, Cart, Your Lists, Help), and utility links (Gift Certificates, International, New Releases, Top Sellers, Today's Deals, Sell Your Stuff).
- Search Bar:** Search Amazon.com with a GO button and a Find Gifts button.
- Left Sidebar (Browse):**
  - Books, Music & Movies: Books, DVD, Magazines & Newspapers, Music, Textbooks, VHS
  - Clothing & Accessories: Apparel & Accessories, Jewelry & Watches, Shoes
  - Computer & Office: Computers, Office Products, Software
  - Consumer Electronics: Audio & Video, Camera & Photo, Cell Phones & Service, Computer & Video Games, All Consumer Electronics
  - Food & Household: Gourmet Food, Grocery
- Main Content Area:**
  - Get your Amazon.com Visa Card Instantly and Save \$30 Today!** Existing cardholders, check for special offers. [Find out how](#)
  - Free Shutterfly Prints** Right now, receive a free Shutterfly print bundle (a \$25 value) when you purchase a qualifying digital camera, memory card, digital camcorder, camera bag, or digital frame. Hurry--this offer is for a limited time. [See more details](#)
  - Overheard on This Week's Amazon Fishbowl with Bill Maher, Presented by UPS and Cingular**
    - Kathy Reichs: "I come in after the bad"
    - Morgan Spurlock: "I'd been locked up for a"
    - Daniel Powter: "On his smash hit 'Bad"
- Right Sidebar:**
  - Save \$10 Today in Amazon Grocery** We've just launched Amazon Grocery and to celebrate, we're offering \$10 off orders over \$49. Here's how. Eligible for Amazon Prime and FREE Super Saver Shipping. [Shop Amazon Grocery](#)
  - Remanufactured IBM ThinkPad T40 1.6 GHz Pentium M** Built specifically for mobile business professionals, the remanufactured IBM ThinkPad T40... [Find out more](#)

**FIGURE 3-12 THE VALUE WEB**

The value web is a networked system that can synchronize the value chains of business partners within an industry to respond rapidly to changes in supply and demand.

Figure 3-12 shows that this value web synchronizes the business processes of customers, suppliers, and trading partners among different companies in an industry or in related industries. These value webs are flexible and adaptive to changes in supply and demand. Relationships can be bundled or unbundled in response to changing market conditions. Firms will accelerate time to market and to customers by optimizing their value web relationships to make quick decisions on who can deliver the required products or services at the right price and location.

## SYNERGIES, CORE COMPETENCIES, AND NETWORK-BASED STRATEGIES

A large corporation is typically a collection of businesses. Often, the firm is organized financially as a collection of strategic business units, and the returns to the firm are directly tied to the performance of all the strategic business units. Information systems can improve the overall performance of these business units by promoting synergies and core competencies.

### Synergies

The idea of synergies is that when the output of some units can be used as inputs to other units, or two organizations pool markets and expertise, these relationships lower costs and generate profits. Recent bank and financial firm mergers, such as the mergers of JPMorgan Chase and BankOne

Corporation, Bank of America and FleetBoston Financial Corporation, and Deutsche Bank and Bankers Trust, occurred precisely for this purpose, as did the merger of US Airways and America West described in the chapter-opening case.

One use of information technology in these synergy situations is to tie together the operations of disparate business units so that they can act as a whole. For example, merging with Bank One provided JPMorgan Chase with a massive network of retail branches in the Midwest and Southwest. Information systems help the merged banks lower retailing costs and increase cross-marketing of financial products. The chapter-opening case describes the role of information systems in lowering costs and coordinating operations for US Airways after its merger.

### Enhancing Core Competencies

Yet another way to use information systems for competitive advantage is to think about ways that systems can enhance core competencies. The argument is that the performance of all business units will increase insofar as these business units develop, or create, a central core of competencies. A **core competency** is an activity for which a firm is a world-class leader. Core competencies may involve being the world's best miniature parts designer, the best package delivery service, or the best thin-film manufacturer. In general, a core competency relies on knowledge that is gained over many years of experience and a first-class research organization or simply key people who follow the literature and stay abreast of new external knowledge.

Any information system that encourages the sharing of knowledge across business units enhances competency. Such systems might encourage or enhance existing competencies and help employees become aware of new external knowledge; such systems might also help a business leverage existing competencies to related markets.

For example, Procter & Gamble (P&G), a world leader in brand management and consumer product innovation, uses a series of systems to enhance its core competencies. P&G uses an intranet called InnovationNet to help people working on similar problems share ideas and expertise. The system connects those working in research and development (R&D), engineering, purchasing, marketing, legal affairs, and business information systems around the world, using a portal to provide browser-based access to documents, reports, charts, videos, and other data from various sources. In 2001, InnovationNet added a directory of subject-matter experts who can be tapped to give advice or collaborate on problem solving and product development, and created links to outside research scientists and 150 entrepreneurs who are searching for new, innovative products worldwide.

P&G sells more than 300 different branded products, with separate lines of business for Fabric and Home Care, Baby and Family Care, Beauty Care, Health Care, and Snacks and Beverages. It now uses custom-developed marketing management software to help all these groups share marketing ideas and data for marketing campaigns. This system supports strategic planning, research, advertising, direct mail, and events, and is able to analyze the impact of marketing projects on the business.

### Network-Based Strategies

The availability of Internet and networking technologies has inspired strategies that take advantage of firms' abilities to create networks or network with each

other. Network-based strategies include the use of network economics, a virtual company model, and business ecosystems.

### Network Economics

Business models based on a network may help firms strategically by taking advantage of **network economics**. In traditional economics—the economics of factories and agriculture—production experiences diminishing returns. The more any given resource is applied to production, the lower the marginal gain in output, until a point is reached where the additional inputs produce no additional outputs. This is the law of diminishing returns, and it is the foundation for most of modern economics.

In some situations, the law of diminishing returns does not work. For instance, in a network, the marginal costs of adding another participant are about zero, whereas the marginal gain is much larger. The larger the number of subscribers in a telephone system or the Internet, the greater the value to all participants because each user can interact with more people. It is no more expensive to operate a television station with 1,000 subscribers than with 10 million subscribers. The value of a community of people grows with size, whereas the cost of adding new members is inconsequential.

From this network economics perspective, information technology can be strategically useful. Internet sites can be used by firms to build communities of users—like-minded customers who want to share their experiences. This builds customer loyalty and enjoyment, and builds unique ties to customers. eBay, the giant online auction site, and iVillage, an online community for women, are examples. Both businesses are based on networks of millions of users, and both companies have used the Web and Internet communication tools to build communities. The more people offering products on eBay, the more valuable the eBay site is to everyone because more products are listed, and more competition among suppliers lowers prices. Network economics also provides strategic benefits to commercial software vendors. The value of their software and complementary software products increases as more people use them, and there is a larger installed base to justify continued use of the product and vendor support.

### Virtual Company Strategy

Another network-based strategy uses the model of a virtual company to create a competitive business. A **virtual company**, also known as a virtual organization, uses networks to link people, assets, and ideas, enabling it to ally with other companies to create and distribute products and services without being limited by traditional organizational boundaries or physical locations. One company can use the capabilities of another company without being physically tied to that company. The virtual company model is useful when a company finds it cheaper to acquire products, services, or capabilities from an external vendor or when it needs to move quickly to exploit new market opportunities and lacks the time and resources to respond on its own.

Fashion companies, such as GUESS, Ann Taylor, Levi Strauss, and Reebok, enlist Hong Kong-based Li & Fung to manage production and shipment of their garments. Li & Fung handles product development, raw material sourcing, production planning, quality assurance, and shipping. Li & Fung does not own any fabric, factories, or machines, outsourcing all of its work to a network of more than 7,500 suppliers in 37 countries all over the world. Customers place orders to Li & Fung over its private extranet. Li & Fung then sends instructions



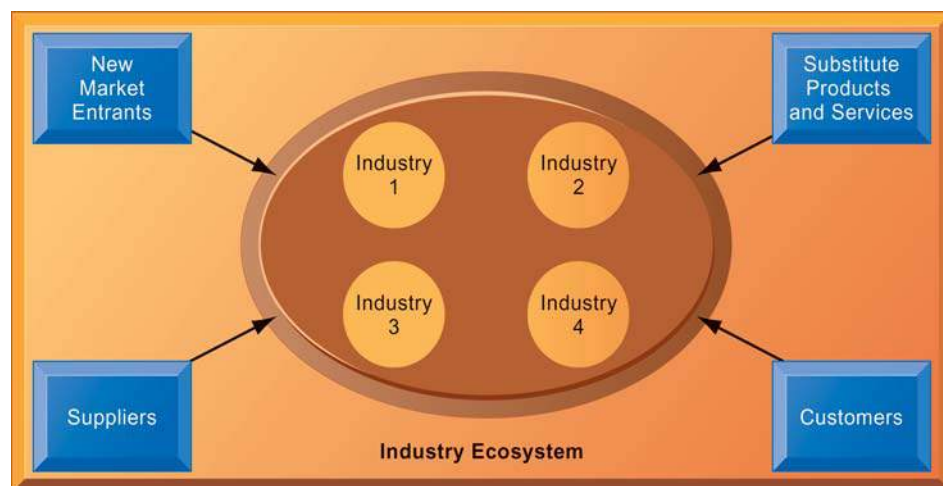
to appropriate raw material suppliers and factories where the clothing is produced. The Li & Fung extranet tracks the entire production process for each order. Working as a virtual company keeps Li & Fung flexible and adaptable so that it can design and produce the products ordered by its clients in short order to keep pace with rapidly changing fashion trends.

### Business Ecosystems: Keystone and Niche Firms

The Internet and the emergence of digital firms call for some modification of the industry competitive forces model. The traditional Porter model assumes a relatively static industry environment; relatively clear-cut industry boundaries; and a relatively stable set of suppliers, substitutes, and customers, with the focus on industry players in a market environment. Instead of participating in a single industry, some of today's firms are much more aware that they participate in industry sets—collections of industries that provide related services and products (see Figure 3-13). **Business ecosystem** is another term for these loosely coupled but interdependent networks of suppliers, distributors, outsourcing firms, transportation service firms, and technology manufacturers (Iansiti and Levien, 2004).

The concept of a business ecosystem builds on the idea of the value web described earlier, the main difference being that cooperation takes place across many industries rather than many firms. For instance, both Microsoft and Wal-Mart provide platforms composed of information systems, technologies, and services that thousands of other firms in different industries use to enhance their own capabilities. Microsoft has estimated that more than 40,000 firms use its Windows platform to deliver their own products, support Microsoft products, and extend the value of Microsoft's own firm. Wal-Mart's order entry and inventory management system is a platform used by thousands of suppliers to obtain real-time access to customer demand, track shipments, and control inventories.

**FIGURE 3-13 AN ECOSYSTEM STRATEGIC MODEL**



The digital firm era requires a more dynamic view of the boundaries among industries, firms, customers, and suppliers, with competition occurring among industry sets in a business ecosystem. In the ecosystem model, multiple industries work together to deliver value to the customer. IT plays an important role in enabling a dense network of interactions among the participating firms.



Business ecosystems can be characterized as having one or a few keystone firms that dominate the ecosystem and create the platforms used by other niche firms. Keystone firms in the Microsoft ecosystem include Microsoft and technology producers such as Intel and IBM. Niche firms include thousands of software application firms, software developers, service firms, networking firms, and consulting firms that both support and rely on the Microsoft products.

Information technology plays a powerful role in establishing business ecosystems. Obviously, many firms use information systems to develop into keystone firms by building IT-based platforms that other firms can use. For instance, eBay has created a platform for auctions and online stores used by over 400,000 small businesses every day. Amazon.com and portals such as Yahoo! have created online store business platforms used by Fortune 500 firms such as Dell (and thousands of smaller firms) to sell directly to the public. In the digital firm era, we can expect greater emphasis on the use of IT to build industry ecosystems because the costs of participating in such ecosystems will fall and the benefits to all firms will increase rapidly as the platform grows.

Individual firms should consider how their information systems will enable them to become profitable niche players in larger ecosystems created by keystone firms. For instance, in making decisions about which products to build or which services to offer, a firm should consider the existing business ecosystems related to these products and how it might use IT to enable participation in these larger ecosystems.

### 3.4 USING SYSTEMS FOR COMPETITIVE ADVANTAGE: MANAGEMENT ISSUES

Strategic information systems often change the organization as well as its products, services, and operating procedures, driving the organization into new behavioral patterns. Successfully using information systems to achieve a competitive advantage is challenging and requires precise coordination of technology, organizations, and management.

#### SUSTAINING COMPETITIVE ADVANTAGE

The competitive advantages strategic systems confer do not necessarily last long enough to ensure long-term profitability. Because competitors can retaliate and copy strategic systems, competitive advantage is not always sustainable. Markets, customer expectations, and technology change; globalization has made these changes even more rapid and unpredictable. The Internet can make competitive advantage disappear very quickly because virtually all companies can use this technology. Classic strategic systems, such as American Airlines's SABRE computerized reservation system, Citibank's ATM system, and FedEx's package tracking system, benefited by being the first in their industries. Then rival systems emerged. Amazon.com, discussed earlier in this chapter, was an e-commerce leader but now faces competition from eBay, Yahoo!, and Google. Information systems alone cannot provide an enduring business advantage. Systems originally intended to be strategic frequently become tools for survival, required by every firm to stay in business, or they may inhibit organizations from making the strategic changes essential for future success.

## PERFORMING A STRATEGIC SYSTEMS ANALYSIS

Managers interested in using information systems for competitive advantage will need to perform a strategic systems analysis. To identify the types of systems that provide a strategic advantage to their firms, managers should ask the following questions:

1. What is the structure of the industry in which the firm is located?
  - What are some of the competitive forces at work in the industry? Are there new entrants to the industry? What is the relative power of suppliers, customers, and substitute products and services over prices?
  - Is the basis of competition quality, price, or brand?
  - What are the direction and nature of change within the industry? From where are the momentum and change coming?
  - How is the industry currently using information technology? Is the organization behind or ahead of the industry in its application of information systems?
  
2. What are the business, firm, and industry value chains for this particular firm?
  - How is the company creating value for the customer—through lower prices and transaction costs or higher quality? Are there any places in the value chain where the business could create more value for the customer and additional profit for the company?
  - Does the firm understand and manage its business processes using the best practices available? Is it taking maximum advantage of supply chain management, customer relationship management, and enterprise systems?
  - Does the firm leverage its core competencies?
  - Is the industry supply chain and customer base changing in ways that benefit or harm the firm?
  - Can the firm benefit from strategic partnerships and value webs?
  - Where in the value chain will information systems provide the greatest value to the firm?

## MANAGING STRATEGIC TRANSITIONS

Adopting the kinds of strategic systems described in this chapter generally requires changes in business goals, relationships with customers and suppliers, and business processes. These sociotechnical changes, affecting both social and technical elements of the organization, can be considered **strategic transitions**—a movement between levels of sociotechnical systems.

Such changes often entail blurring of organizational boundaries, both external and internal. Suppliers and customers must become intimately linked and may share each other's responsibilities. Managers will need to devise new business processes for coordinating their firms' activities with those of customers, suppliers, and other organizations. The organizational change requirements surrounding new information systems are so important that they merit attention throughout this text. Chapter 14 examines organizational change issues in more detail.

## 3.5 HANDS-ON MIS

The projects in this section give you hands-on experience analyzing a company's competitive strategy, using a database to improve decision making about business strategy, and using Web tools to configure and price an automobile.

### Analyzing Competitive Strategy

Software skills: Web browser software and presentation software

Business skills: Value chain and competitive forces analysis, business strategy formulation



This project provides an opportunity for you to develop the competitive strategy for a real-world business. You'll use the Web to identify Dirt Bikes's competitors and the competitive forces in its industry. You'll use value chain analysis to determine what kinds of information systems will provide the company with a competitive advantage.

Dirt Bikes's management wants to be sure it is pursuing the right competitive strategy. You have been asked to perform a competitive analysis of the company using the Web to find the information you need. Prepare a report that analyzes Dirt Bikes using the value chain and competitive forces models. Your report should include the following:

- Which activities at Dirt Bikes create the most value? [Hint: review company description.]
- How does Dirt Bikes provide value to its customers? [Hint: review company description.]
- Who are Dirt Bikes's major competitors? How do their products compare in price to those of Dirt Bikes? What are some of the product features they emphasize?
- What are the competitive forces that can affect the industry? [Hint: research the dirt bikes and motor cycle industry online].
- What competitive strategy should Dirt Bikes pursue? [Hint: review discussion of Porter in this chapter.]
- What information systems best support that strategy?
- (Optional) Use electronic presentation software to summarize your findings for management.

### Improving Decision Making: Using a Database to Clarify Business Strategy

Software skills: Database querying and reporting; database design

Business skills: Reservation systems; customer analysis

In this exercise, you will use database software to analyze the reservation transactions for a hotel and use that information to fine-tune the hotel's business strategy and marketing activities.

The Presidents' Inn is a small three-story hotel on the Atlantic Ocean in Cape May, New Jersey, a popular northeastern U.S. resort. Ten rooms overlook side streets, 10 rooms have bay windows that offer limited views of the ocean, and the remaining 10 rooms in the front of the hotel face the ocean. Room rates are based on room choice, length of stay, and number of guests per room. Room rates are the same for one to four guests. Fifth and sixth guests must pay

ID	Guest First Name	Guest Last Name	Room	Room Type	Arrival Date	Departure Date	No of Guests	Daily Rate
1	Barry	Lloyd	Hayes	Bay-window	12/1/2006	12/4/2006	2	\$150.00
2	Michael	Lunsford	Cleveland	Ocean	12/1/2006	12/9/2006	3	\$112.50
3	Kim	Kyuong	Coolidge	Bay-window	12/4/2006	12/7/2006	1	\$150.00
4	Edward	Holt	Washington	Ocean	12/1/2006	12/3/2006	4	\$325.00
5	Thomas	Collins	Lincoln	Ocean	12/9/2006	12/13/2006	2	\$300.00
6	Paul	Bodkin	Coolidge	Bay-window	12/1/2006	12/3/2006	2	\$150.00
7	Randall	Battenburg	Washington	Ocean	12/4/2006	12/12/2006	2	\$292.50
8	Calvin	Nowotney	Lincoln	Ocean	12/2/2006	12/4/2006	1	\$300.00
9	Homer	Gonzalez	Lincoln	Ocean	12/5/2006	12/7/2006	5	\$320.00
10	David	Sanchez	Jefferson	Bay-window	12/5/2006	12/7/2006	2	\$175.00
11	Buster	Whisler	Jackson	Ocean	12/5/2006	12/8/2006	2	\$250.00
12	Julia	Martines	Reagan	Bay-window	12/10/2006	12/15/2006	1	\$150.00
13	Samuel	Kim	Truman	Side	12/20/2006	12/30/2006	3	\$112.50
14	Arthur	Gottfried	Garfield	Side	12/13/2006	12/15/2006	2	\$125.00
15	Darlene	Shore	Arthur	Ocean	12/24/2006	12/31/2006	5	\$198.00
16	Carlyle	Charleston	Quincy Adams	Bay-window	12/3/2006	12/6/2006	2	\$150.00
17	Albert	Goldstone	Johnson	Ocean	12/5/2006	12/7/2006	3	\$250.00
18	Charlene	Tilson	Van Buren	Bay-window	12/5/2006	12/7/2006	1	\$150.00
19	Ernest	Chad	Madison	Ocean	12/11/2006	12/14/2006	2	\$175.00

an additional \$20 charge each per day. Guests staying for seven days or more receive a 10 percent discount on their daily room rates.

Business has grown steadily during the past 10 years. Now totally renovated, the inn uses a romantic weekend package to attract couples, a vacation package to attract young families, and a weekday discount package to attract business travelers. The owners currently use a manual reservation and bookkeeping system, which has caused many problems. Sometimes two families have been booked in the same room at the same time. Management does not have immediate data about the hotel's daily operations and income.

At the Laudon Web site for Chapter 3, you will find a database for hotel reservation transactions developed in Microsoft Access. Illustrated below are some sample records from that database.

Develop several reports in Access that provide information to help management make the business more competitive and profitable. Your reports should answer the following questions:

- What is the average length of stay per room type?
- What is the average number of visitors per room type?
- What is the base income per room (i.e., length of visit multiplied by the daily rate) during a specified period of time?
- What is the strongest customer base?

After answering these questions, write a brief report describing what the database information reveals about the current business situation. Which specific business strategies might be pursued to increase room occupancy and revenue? How could the database be improved to provide better information for strategic decisions?

## Improving Decision Making: Using Web Tools to Configure and Price an Automobile

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Software skills: Internet-based software

Business skills: Researching product information and pricing

The Web is an online library of consumer information besides being a marketplace where goods and services are purchased. The Web has an extraordinary influence on off-line purchases: more than 80 percent of new car buyers research their dream cars online first (Laudon and Traver, 2006).

In this exercise, you will use software at Web sites for selling cars to find product information about a car of your choice and use that information to make an important purchase decision. You will also evaluate two of these sites as selling tools.

Let's assume your seven-year-old car has tried your patience one too many times, and you've decided to purchase a new automobile. You have been interested in a Ford family car and want to investigate the Ford Fusion (if you are personally interested in another car, domestic or foreign, investigate that one instead). Go to the Web site of CarsDirect ([www.carsdirect.com](http://www.carsdirect.com)) and begin your investigation. Locate the Ford Fusion. Research the various specific automobiles available in that model and determine which you prefer. Explore the full details about the specific car, including pricing, standard features, and options. Locate and read at least two reviews if possible. Investigate the safety of that model based on the U.S. government crash tests performed by the National Highway Traffic Safety Administration if those test results are available. Explore the features for locating a vehicle in inventory and purchasing directly. Finally, explore the other capabilities of the CarsDirect site for financing.

Having recorded or printed the information you need from CarsDirect for your purchase decision, surf the Web site of the manufacturer, in this case Ford ([www.ford.com](http://www.ford.com)). Compare the information available on Ford's Web site with that of CarsDirect for the Ford Fusion. Be sure to check the price and any incentives being offered (which may not agree with what you found at CarsDirect). Next, find a dealer on the Ford site so that you can view the car before making your purchase decision. Try to locate the lowest price for the car you want in a local dealer's inventory. Which site would you use to purchase your car? Why? Suggest improvements for the sites of CarsDirect and Ford.

## LEARNING TRACK MODULE

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*The Changing Business Environment for Information Technology.* This Learning Track surveys the major changes in the global business environment facing firms today. You can find the Learning Track on the Laudon Web site for this chapter and on the Student CD-ROM.



## Summary

1. *Identify and describe important features of organizations that managers need to know about in order to build and use information systems successfully.*

Managers need to understand certain essential features of organizations to build and use information systems successfully. All modern organizations are hierarchical, specialized, and impartial, using explicit routines to maximize efficiency. All organizations have their own cultures and politics arising from differences in interest groups, and they are affected by their surrounding environment. Organizations differ in goals, groups served, social roles, leadership styles, incentives, types of tasks performed, and type of structure. These features help explain differences in organizations' use of information systems.

2. *Evaluate the impact of information systems on organizations.*

Information systems and the organizations in which they are used interact with and influence each other. The introduction of a new information system will affect organizational structure, goals, work design, values, competition between interest groups, decision making, and day-to-day behavior. At the same time, information systems must be designed to serve the needs of important organizational groups and will be shaped by the organization's structure, tasks, goals, culture, politics, and management. Information technology can reduce transaction and agency costs, and such changes have been accentuated in organizations using the Internet.

Information systems are closely intertwined with an organization's structure, culture, and business processes. New systems disrupt established patterns of work and power relationships, so there is often considerable resistance to them when they are introduced. The complex relationship between information systems, organizational performance, and decision making must be carefully managed.

3. *Demonstrate how Porter's competitive forces model and the value chain model help businesses use information systems for competitive advantage.*

In Porter's competitive forces model, the strategic position of the firm, and its strategies, are determined by competition with its traditional direct competitors but also they are greatly affected by new market entrants, substitute products and services, suppliers, and customers. Information systems help companies compete by maintaining low costs, differentiating products or services, focusing on market niche, strengthening ties with customer and suppliers, and increasing barriers to market entry with high levels of operational excellence.

The value chain model highlights specific activities in the business where competitive strategies and information systems will have the greatest impact. The model views the firm as a series of primary and support activities that add value to a firm's products or services. Primary activities are directly related to production and distribution, whereas support activities make the delivery of primary activities possible. A firm's value chain can be linked to the value chains of its suppliers, distributors, and customers. A value web consists of information systems that enhance competitiveness at the industry level by promoting the use of standards and industry-wide consortia, and by enabling businesses to work more efficiently with their value partners.

4. *Demonstrate how information systems help businesses use synergies, core competences, and network-based strategies to achieve competitive advantage.*

Because firms consist of multiple business units, information systems achieve additional efficiencies or enhanced services by tying together the operations of disparate business units. Information systems help businesses leverage their core competencies by promoting the sharing of knowledge across business units. Information systems facilitate business models based on large networks of users or subscribers that take advantage of network economics. A virtual company strategy uses networks to link to other firms so that a company can use the capabilities of other companies to build, market, and distribute products and services. In business ecosystems, multiple industries work together to deliver value to the customer. Information systems support a dense network of interactions among the participating firms.

**5. Assess the challenges posed by strategic information systems and management solutions.**

Implementing strategic systems often requires extensive organizational change and a transition from one sociotechnical level to another. Such changes are called strategic transitions and are often difficult and painful to achieve. Moreover, not all strategic systems are profitable, and they can be expensive to build. Many strategic information systems are easily copied by other firms so that strategic advantage is not always sustainable. A strategic systems analysis is helpful.

## Key Terms

*Agency theory, 91*

*Benchmarking, 105*

*Best practices, 105*

*Business ecosystem, 112*

*Competitive forces model, 96*

*Core competency, 110*

*Efficient customer response systems, 98*

*Mass customization, 99*

*Network economics, 111*

*Organization, 84*

*Primary activities, 104*

*Product differentiation, 97*

*Routines, 86*

*Strategic transitions, 114*

*Support activities, 104*

*Switching costs, 103*

*Transaction cost theory, 90*

*Value chain model, 104*

*Value web, 106*

*Virtual company, 111*

## Review Questions

1. What is an organization? Compare the technical definition of organizations with the behavioral definition.
2. Identify and describe the features of organizations that help explain differences in organizations' use of information systems.
3. Describe the major economic theories that help explain how information systems affect organizations.
4. Describe the major behavioral theories that help explain how information systems affect organizations.
5. Why is there considerable organizational resistance to the introduction of information systems?
6. What is the impact of the Internet on organizations?
7. What is Porter's competitive forces model? How does it work? What does it explain about competitive advantage?
8. What are four competitive strategies enabled by information systems that firms can pursue? How do information systems support each of these competitive strategies? Give examples.
9. What is the value chain model? How can it be used to identify opportunities for strategic information systems?
10. What is the value web? How is it related to the value chain? How does it help identify opportunities for strategic information systems?
11. How has the Internet changed competitive forces and competitive advantage?
12. How do information systems promote synergies and core competencies? How does this enhance competitive advantage?
13. How can businesses benefit by using network economics?
14. What is a virtual company? What are the benefits of pursuing a virtual company strategy?
15. Describe the management challenges posed by strategic information systems in organizations and suggest some ways of dealing with them.

## Discussion Questions

1. It has been said that there is no such thing as a sustainable strategic advantage. Do you agree? Why or why not?
2. It has been said that the advantage that leading-edge retailers such as Dell and Wal-Mart have over their competition isn't technology; it's their management. Do you agree? Why or why not?

## Teamwork: Identifying Opportunities for Strategic Information Systems

With a group of three or four students, select a company described in the *Wall Street Journal*, *Fortune*, *Forbes*, or another business publication. Visit the company's Web site to find additional information about that company and to see how the firm is using the Web. On the basis of this information, analyze the business. Include a description of the organization's

## Video Case

You will find a video case illustrating some of the concepts in this chapter on the Laudon Web site and Student CD-ROM along with questions to help you analyze the case.

features, such as important business processes, culture, structure, and environment, as well as its business strategy. Suggest strategic information systems appropriate for that particular business, including those based on Internet technology, if appropriate. Use electronic presentation software to present your findings to the class.

## Blockbuster vs. Netflix: Which Will Win Out?

### CASE STUDY

When Blockbuster entered the video rental business in 1985, the industry consisted mostly of independent, mom-and-pop-style stores whose entire reach may have been two towns or a few city blocks. In its first 20 years of business, the rental giant opened 9,100 stores in 25 countries, gaining a market share that has been enjoyed by few companies in any industry.

Blockbuster equipped each of its video rental stores with custom software it had designed to simplify rental and sale transactions. An automated point-of-sale system uses a laser bar code scanner to read data from items being rented or sold and from a Blockbuster customer's identification card. These data are transmitted to Blockbuster's corporate computer center. Management uses these data to monitor sales and to analyze the demographics, and rental and sales patterns for each store to improve its marketing decisions.

Blockbuster's success was based on video tape rentals and sales and rentals of DVDs. By 2004, Blockbuster possessed a 40-percent share of the U.S. video rental market, estimated to range from \$7 billion of business per year to \$9 billion; Blockbuster also had video sales of around \$16 billion.

The greatest threat to Blockbuster's viability came from the emergence of a new business model in the video rental market. Launched in 1998, Netflix Inc. intended to cater to those video rental customers who valued convenience above all else. First, the upstart eliminated the need for a physical store. All interactions between Netflix and its customers took place on the Internet and through the postal service. Users could go online and create a wish list of movies they wanted to rent. For a monthly service fee, Netflix mailed up to three movies at a time, which the customer could keep for as long as he or she wanted without incurring late charges. When finished with a movie, the customer mailed it back to Netflix in prestamped packaging provided by the company. Returning a movie prompted Netflix to send the next title on the customer's wish list. For \$19.95 a month, Netflix customers had access to thousands of movie titles without leaving their homes.

According to Kagan Research LLC, revenues from online movie rentals, which were basically nonexistent in 1998, rose to \$522 million in 2004. Kagan projected that the total revenue would approach \$1 billion in 2005 and \$3 billion by 2009. As Netflix caught on and its subscription model became popular, Netflix's gains in market share, from 2 to 7 percent between 2003 and 2004, gave Blockbuster true cause for concern.

To compete in the changing marketplace, Blockbuster made some dramatic changes in its business beginning in 2003. It added an online rental service; Movie Pass, a monthly subscription service for in-store customers; Game Pass, a subscription service for video games; a trading service for movies and games; and the infamous "No More Late Fees" program. The entire question of how to address a new source of competition was a complicated matter. Blockbuster could have chosen to launch an online rental store similar to Netflix and leave it at that. Or, the company could have focused only on its traditional business in an attempt to lure customers back from the rising online tide. Instead, with the initiatives previously mentioned, Blockbuster tried to do both.

Blockbuster's \$100 million increase in capital expenditures from 2003 to 2004 hints at the scale of the restructuring of the business. Many of those millions found their way to the information technology department, which took Netflix on directly by establishing the information systems supporting Blockbuster's own online subscription service. This venture required Blockbuster to construct a new business model within its existing operations.

Rather than meld the two channels, Blockbuster created a new online division with its own offices near corporate headquarters in Dallas. Part of Blockbuster's initial strategy for defeating the competition was to undercut Netflix in both pricing and distribution. Blockbuster set the price for its three-movies-at-a-time monthly subscription at \$19.99, which was, at the time, two dollars less than Netflix's competing plan. Blockbuster had a strategic advantage in distribution as well. Netflix was serving its customers from 35 distribution centers around the country. Blockbuster had 30 such facilities but also

had 4,500 stores in the United States to deliver DVDs to most of its customers in only a day or two at lower shipping costs. Blockbuster also enticed online customers to maintain a relationship with the physical stores by offering coupons for free in-store rentals. Blockbuster's original intent was to integrate the online and in-store services so that customers could float back and forth between the two channels with no restrictions. However, the disparate requirements for revenue recognition and inventory management have so far been too complex to make the plan a reality.

After a year in existence, the report card on Blockbuster's online store was mixed. The service had acquired one million subscribers and the company hoped to double that number within seven months or so. At the same time, Netflix had surpassed three million subscribers and was on its way to four million by the end of the year. Blockbuster continued to pursue gains through pricing, at one point lowering its three-movie plan to \$14.99 per month versus \$17.99 at Netflix. Both companies offer plan variations such as unlimited rentals of one DVD at a time for \$5.99 per month and two at a time with a limit of 4 per month for \$11.99.

In September 2005, research firm SG Cowen declared that Blockbuster's online DVD rental service "remains inferior" to Netflix. The researcher stated that Blockbuster had improved on movie availability but actually fell further behind in ratings of its user interface. The evaluation by SG Cowen came on the heels of rocky financial reports for Blockbuster. Blockbuster's most costly change was likely the "No More Late Fees" campaign it launched in January 2005. The goal of the program was to lure more customers and position Blockbuster better in the market alongside Netflix, which never charged late fees. However, the program may have created more problems than it solved. Blockbuster did measure an increase in in-store rentals after eliminating late fees, but early returns did not suggest that the increase offset the \$250 million to \$300 million in annual late fee revenue that was no longer being collected.

Well-known corporate raider Carl Icahn took advantage of Blockbuster's low share price and acquired 9 percent of the company, entitling him to a position on the board of directors. Icahn harshly criticized CEO John Antico's business strategy. Icahn believed that Blockbuster's new initiatives, such as online rentals, were too expensive and too risky. He believed that the company should take advantage of its prevailing position in the bricks-and-mortar rental industry, even if that industry were

slowly dying. Despite the presence of Icahn, Antico maintained that online rentals were the only segment of the industry open to growth.

Both Blockbuster and Netflix now face a new set of challenges. Fifteen million cable subscribers use video-on-demand (VOD) technology to watch movies and programs that are not yet available on DVD. TiVo and similar digital video recorders combined with VOD could make the rental of movies obsolete. Some analysts still insist that the economics do not make sense for movie studios to abandon DVD sales, which account for 50 percent of their profits, in favor of VOD. And technology does not currently permit the bandwidth for VOD suppliers to provide nearly the number of titles that Blockbuster can. Down the road, however, Blockbuster likely will have to address VOD, especially if the studios can eliminate companies like Blockbuster as an intermediary.

In April 2006, the Internet as a channel for movie distribution finally came into focus. Six movie studios, including Warner Brothers, Sony Pictures, Universal, MGM, and Paramount, reached an agreement with Web site Movielink to sell movies online via download. Until that time, Movielink had offered movie downloads as rentals, which, like the VOD model, the customer could watch for only 24 hours. Sony, MGM, and Lions Gate also reached agreements with a Movielink competitor, CinemaNow, which is partially owned by Lions Gate. Warner Brothers also expanded its presence by entering into relationships with Guba.com and BitTorrent. The studios moved to build on the momentum created by the success of the iTunes music store, which demonstrated that consumers were very willing to pay for legal digital downloads of copyrighted material. At the same time, they hoped that entering the download sales market would enable them to confront the piracy issue in their industry earlier in its development than the music industry was able to do.

While the studios' commitment to these ventures appeared clear, what remained a question was whether they could replicate the success of iTunes. The initial pricing schemes certainly did not offer the same appeal as Apple's \$0.99 per song or \$9.99 per CD. Movielink set the price for new movies at \$20 to \$30. Older movies were discounted to \$10. Movielink was counting on the fact that customers would pay more for the immediacy of downloading a movie in their homes, as opposed to visiting a bricks-and-mortar store like Circuit City or an online store such as Amazon.com, both of which sell new DVDs for less than \$15.00.



However, even if customers were willing to pay a little extra, they were getting less for their money. Most movie downloads did not come with the extra features that are common with DVD releases. Moreover, the downloaded movies were programmed for convenient viewing on computer screens, but transporting them from the computer to the TV screen involved a more complicated process than most consumers were willing to tackle. Neither Movielink nor CinemaNow offered a movie format that could be burned to a DVD and played on a regular DVD player. In fact, CinemaNow downloads were limited to use on a single computer. To watch these movies on a television screen, users would need to have Windows Media Center, which is designed to connect to a TV, or special jacks and cables.

An additional obstacle for both the technology and the consumer to overcome was bandwidth. Even using a broadband Internet connection, high-quality movie files, which generally surpassed 1 gigabyte in file size, required in the neighborhood of 90 minutes to download completely.

Considering these issues, the near-term outlook for the legal digital distribution of movies remains cloudy. Movielink, with only 75,000 downloads per month, was struggling to sustain itself. Neither Blockbuster nor Netflix seemed in a panic to adjust to this new source of competition. While locked in legal battles over patents and antitrust concerns, the two companies had few specific plans related to downloading, though Netflix was widely believed to be considering a set-top box. Netflix said only that downloading was part of its future plans, but expressed dissatisfaction with the terms the movie studios were offering in early discussions.

The one development that has the potential to force the hands of Blockbuster and Netflix is the entrance of Apple into the movie download market. Apple's iTunes store, like Netflix, already had a satisfied and loyal customer base, not to mention a pervasive "cool" factor. And, it was iTunes's successful transition from music-only to music and television downloads that paved the way for Movielink and CinemaNow to sell movie downloads in the first

place. Apple is said to be on the verge of adding movies to its store and would stick to its flat-rate pricing model. Industry rumors indicated that Apple CEO Steve Jobs intended to sell downloads of all movies for \$9.99. Industry experts characterized Apple's involvement as a possible "tipping point" for online movie distribution.

In the meantime, Antico wants Blockbuster to stay very close to the cutting edge of technology in his industry. Doing so, he believes will enable the company to replace directly any rental revenues lost to new technology. Meanwhile, add Amazon to the list of competitive threats on which Blockbuster must also keep a careful eye. Amazon.com already operates an online movie rental service in the United Kingdom. Could there be another player to compete with Blockbuster and Netflix? Or could a new partnership shake up the industry again?

**Sources:** Saul Hansell, "At Last, Movies to Keep Arrive on the Internet," *The New York Times*, April 3, 2006; Sarah McBride, "Movie Debut: Films for Sale by Download," *The Wall Street Journal*, April 3, 2006; Nate Mook, "Netflix Mulls Movie Download Service," *BetaNews.com*, June 21, 2006; "Guba Sells Sony Films," *RedHerring.com*, July 11, 2006; Michael Greeson, "iTunes' Movie Downloads the 'Tipping Point' for Online Movie Distribution," *DigitalTrends.com*, June 22, 2006; Mark Glaser, "Movie Download Services Still Need Work," *PBS.org*, June 30, 2006; Mike Snider, "Movie Downloads Can Be Fun, and the Technology Is Advancing," *USA Today*, accessed via *Citizen-Times.com*, July 4, 2006; "Guba to Distribute Warner Bros. Movies," *Reuters*, accessed via *Yahoo! News*, June 26, 2006; Janet Rae-Dupree, "Blockbuster: Movie Business Remains a Moving Target," *CIO Insight*, August 10, 2005; Dinesh C. Sharma,

## CASE STUDY QUESTIONS

1. What is Blockbuster's business model? How successful has it been?
2. What industry and technology forces have challenged that business model? What problems have they created?
3. Is Blockbuster developing successful solutions to its problems? Are there other solutions it should have considered?
4. How successful is Netflix and its business model?
5. Do you think Blockbuster or Netflix will succeed in the future? Explain your answer.