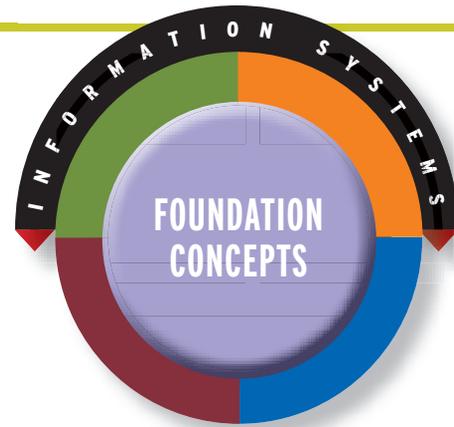


COMPETING WITH INFORMATION TECHNOLOGY



CHAPTER HIGHLIGHTS

Fundamentals of Strategic Advantage

Strategic IT

Competitive Strategy Concepts

REAL WORLD CHALLENGE: CenterPoint Properties—Creating a New Company for a New Business

Strategic Uses of Information Technology

Building a Customer-Focused Business

The Value Chain and Strategic IS

Using Information Technology for Strategic Advantage

Strategic Uses of IT

Reengineering Business Processes

Becoming an Agile Company

Creating a Virtual Company

Building a Knowledge-Creating Company

Knowledge Management Systems

REAL WORLD SOLUTION: CenterPoint Properties—Reinventing a Company with the Help of IT

REAL WORLD CASE: How to Win Friends and Influence Business People: Quantify IT Risks and Value

REAL WORLD CASE: For Companies Both Big and Small: Running a Business on Smartphones

LEARNING OBJECTIVES

- 2-1** Identify several basic competitive strategies and explain how they use information technologies to confront the competitive forces faced by a business.
- 2-2** Identify several strategic uses of Internet technologies and give examples of how they can help a business gain competitive advantages.
- 2-3** Give examples of how business process reengineering frequently involves the strategic use of Internet technologies.
- 2-4** Identify the business value of using Internet technologies to become an agile competitor or form a virtual company.
- 2-5** Explain how knowledge management systems can help a business gain strategic advantages.

Fundamentals of Strategic Advantage

Technology is no longer an afterthought in forming business strategy, but the actual cause and driver.

This chapter will show you that it is important to view information systems as more than a set of technologies that support efficient business operations, workgroup and enterprise collaboration, or effective business decision making. This has been a traditional role, for sure, and is an important application of these technologies. Beyond supporting the fundamental processes of an organization, however, information technology can change the way businesses compete. You should also view information systems strategically, that is, as vital competitive networks, as a means of organizational renewal, and as a necessary investment in technologies; such technologies help a company adopt strategies and business processes that enable it to reengineer or reinvent itself to survive and succeed in today's dynamic business environment.

The first part of this chapter introduces fundamental competitive strategy concepts that underlie the strategic use of information systems. Following that, we will explore several major strategic applications of information technology used by many companies today.

Begin by reading the Real World Challenge below. We can learn a lot about the challenges faced by CenterPoint Properties as it seeks to reinvent itself. See Figure 2.1.

In Chapter 1, we emphasized that a major role of information systems applications in business is to provide effective support of a company's strategies for gaining competitive advantage. This strategic role of information systems involves using information technology to develop products, services, and capabilities that give a company major advantages over the competitive forces it faces in the global marketplace.

This role is accomplished through a *strategic information architecture*: the collection of **strategic information systems** that supports or shapes the competitive position and strategies of a business enterprise. So a strategic information system can be any kind of information system (e.g., TPS, MIS, and DSS) that leverages information technology to help an organization gain a competitive advantage, reduce a competitive disadvantage, or meet other strategic enterprise objectives.

Figure 2.2 illustrates the various competitive forces a business might encounter, as well as the competitive strategies that can be adopted to counteract such forces. It is important to note that the figure suggests that any of the major strategies may be deemed useful against any of the common competitive forces. Although it is rare and unlikely that a single firm would use all strategies simultaneously, each has value in certain circumstances. For now, it is only important that you become familiar with the available strategic approaches. Let us look at several basic concepts that define the role of competitive strategy as it applies to information systems.

Competitive Forces and Strategies

How should a business professional think about competitive strategies? How can a business use information systems to apply competitive strategies? Figure 2.2 illustrates an important conceptual framework for understanding forces of competition and the various competitive strategies employed to balance them.

A company can survive and succeed in the long run only if it successfully develops strategies to confront five **competitive forces** that shape the structure of competition in its industry. In Michael Porter's classic model of competition, any business that

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COMPETITIVE STRATEGY CONCEPTS

LO 2-1

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CenterPoint Properties— Creating a New Company for a New Business

CenterPoint Properties, headquartered in Oak Brook, Illinois, is a leading real estate company focused on the development, ownership, and management of industrial real estate and infrastructure assets in the logistics and transportation arena, such as rail depots, roads, and port facilities. The company started its operations in 1984 as Capital and Regional Properties Corporation, a subsidiary of Capital and Regional plc, which was traded on the London Stock Exchange. In 1993 the company successfully completed its initial public offering in the United States, structured as a publicly traded REIT (Real Estate Investment Trust, a security that sells like a stock on the major exchanges but is limited in focus to investing in real estate properties, either directly or through mortgage-backed securities) after acquiring and consolidating the operations of FCLS Investor Group, an industrial development company based in Chicago.

Since then and more than halfway through the first decade of the 21st century, CenterPoint Properties became the largest real estate company in the Chicago region. An undisputed successful performer, the company consistently increased shareholder value and outperformed every related market index. At the same time, however, management started to realize that their current business model,

which had brought them to this point, was not going to last forever. Every successful business model has a life cycle, in which competitors start to understand what makes a successful company successful, and slowly begin to catch up with market leaders. Under those conditions, innovation is key. Management realized that if CenterPoint wanted to continue to grow and remain one step ahead of the competition, it would need to evolve. And that would not be easy—real estate companies are hardly known for their introduction of innovative products and services. In fact, CenterPoint realized that it would need to transform itself into an entirely different player—a developer and provider of logistic solutions.

In hindsight, it all started when CenterPoint became involved in the development of some of the largest intermodal transportation facilities in the United States. An intermodal facility is one where an interface occurs between two or more different modes of transportation. For passenger traffic, a terminal where riders transfer from train service to a bus would be an example of an intermodal facility. When freight and cargo are of interest, these may involve the loading and unloading of cargo from trucks to railroads, or port facilities where container ships are unloaded and the containers are then transferred by a different means of transportation to their final destination.

After years of experience managing those facilities and the significant real estate developments associated with them, management came to realize that they had been providing supply chain solutions to their customers under the guise of real estate management. As the logistics industry became more and more competitive and globalized, management saw an opportunity to transform the company into a provider of business solutions to their clients. “We saw the opportunity to become a leader in developing intermodal, port, and transportation-related real estate solutions, but we knew the window of opportunity wouldn’t be open forever,” says Scott Zimmerman, Chief Information Officer for CenterPoint.

For that to happen, however, CenterPoint found it would have to reinvent itself as a different organization. An entirely new financial and capital structure would be needed, as public markets with their focus on short-term measures of profitability were not ideally suited to the kind of large-scale, long-term, and capital-intensive projects the

FIGURE 2.1



CenterPoint Properties faces some tough decisions as it seeks to transform itself into a world-class provider of real estate solutions—and IT is at the center of those solutions.

SOURCE: © Phil Boorman/agefotostock.

company had in mind. This would in turn mandate a new and redesigned reporting structure, and extensive collaboration with stakeholders beyond the traditional boundaries of the existing corporation. One of the keys to success in this new endeavor would be the ability to grow the business exponentially without a commensurate growth in head count. In other words, CenterPoint needed a way to make their business very scalable—something for which IT is the perfect candidate. Doing so, however, would require a degree of integration between IT and the business that was unprecedented both at CenterPoint and within the real estate industry in general. But management knew there was no other way in which they could accomplish this major transformation without heavy involvement from IT.

“We needed an intuitive, scalable enterprise solution designed specifically to support our unique business processes, yet agile enough to adapt to our new lines of business; we needed an inviting and secure system that would not only process data, but also help turn it into real-time information, providing CenterPoint with a significant competitive advantage,” says Zimmerman. Intuitive, scalable, and secure. Supportive and customized, but adaptive and agile at the same time. Real-time information and competitive advantage. A tall order for anything and anyone, but the company knew that the new IT infrastructure they needed was at the heart of the entire project.

Unfortunately, whatever it was that Zimmerman envisioned, it was clearly not available in commercial form. Most commercially available real estate software packages were designed for, well, real estate companies. Their functionality was geared toward the administration of few but large multitenant buildings, where the central processes

dealt with contract management, maintenance, billing and collections, and the like. CenterPoint, on the other hand, needed a solution for managing a large number of properties, but each with fewer tenants and involving the full life cycle of the facility, from acquisition through disposition. Commercial real estate software was mostly limited only to the property management phase of that life cycle.

In addition, there was also some skepticism from within the ranks of management as to what IT CenterPoint would need to move forward with its transformation. Specifically, it was difficult to visualize what the final system would look like, not only aesthetically, but also regarding required functionality. The company also had a number of software products that had been working well for some time, and some felt that it would be both faster and less expensive to modify or retool the existing technologies to support the new business model than to implement a new system from scratch, particularly if no commercial software were readily available.

At this juncture, CenterPoint management needed to decide on the best way to move forward. Without a doubt, the company would emerge as a radically different organization, focused on a new business model, which would in turn require the development of new competencies if it wanted to be successful. It was also clear that IT would be at the core of the transformation. The best way to move forward, however, was not as evident.

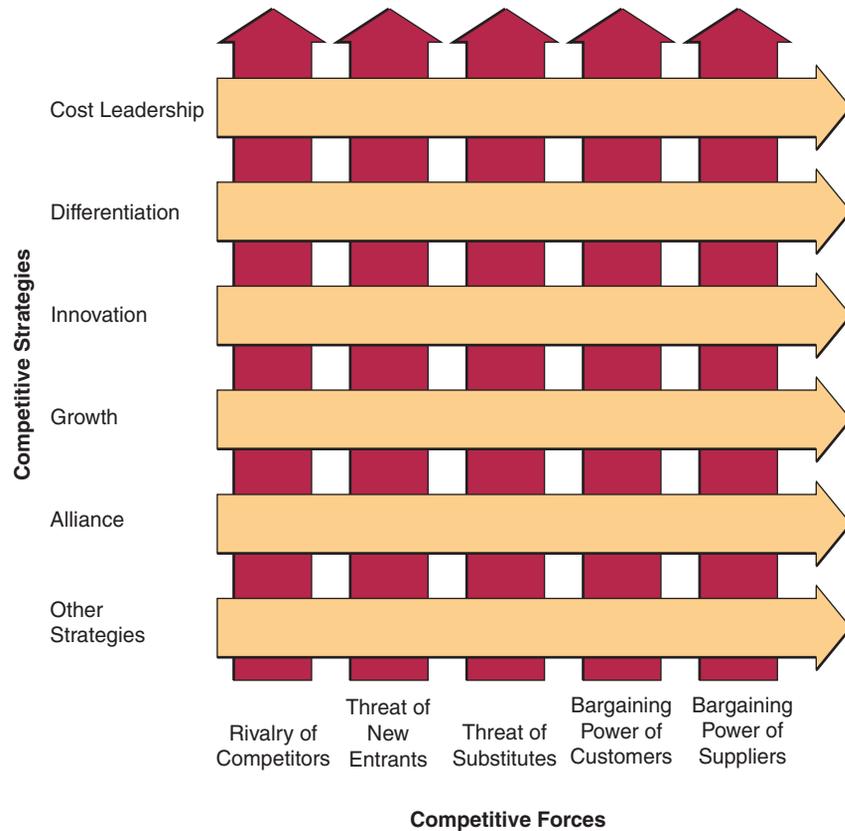
SOURCE: Adapted from “CenterPoint Properties,” *Computerworld Honors Program Case Study*, www.centerpoint-prop.com, accessed May 9, 2011, and “Office Business Application at the Heart of Commercial Real-Estate Company’s Success,” *Microsoft Office System Customer Solution Case Study*.

QUESTIONS TO CONSIDER

1. What do you think will be the major challenges CenterPoint will face as it embarks on its transformation from real estate manager into a provider of logistic solutions? What part of those challenges will be related to IT? What does your answer say about the importance of IT in organizations today?
2. What are some of the alternatives that CenterPoint has for procuring the new functionality required from their IT for the new business model? What are the advantages and disadvantages of each of those alternatives?
3. Is it a good idea to roll out a new, large IT implementation at the same time the company is embarking on a major transformation? On the other hand, is it possible to radically transform a company without major changes in IT?

FIGURE 2.2

Businesses can develop competitive strategies to counter the actions of the competitive forces they confront in the marketplace.



wants to survive and succeed must effectively develop and implement strategies to counter (1) *the rivalry of competitors within its industry*, (2) *the threat of new entrants into an industry and its markets*, (3) *the threat posed by substitute products that might capture market share*, (4) *the bargaining power of customers*, and (5) *the bargaining power of suppliers*.

Competition is a positive characteristic in business, and competitors share a natural, and normally healthy, rivalry. This rivalry encourages and sometimes requires a constant effort to gain competitive advantage in the marketplace. This ever-present competitive force requires a commitment of significant resources on the part of a firm.

Guarding against the threat of new entrants also requires the expenditure of significant organizational resources. Not only do firms need to compete with other firms in the marketplace, but they must also work to create significant barriers to the entry of new competition. This competitive force has always been difficult to manage, but it is even more so today. The Internet has created many ways to enter the marketplace quickly and with relatively low cost. In the Internet world, a firm's biggest potential competitor may be one that is not yet in the marketplace but could emerge almost overnight.

The threat of substitutes is another competitive force that confronts a business. The effect of this force is apparent almost daily in a wide variety of industries, often at its strongest during periods of rising costs or inflation. When airline prices get too high, people substitute car travel for their vacations. When the cost of steak gets too high, people eat more hamburger and fish. Most products or services have some sort of substitute available to the consumer.

Finally, a business must guard against the often opposing forces of customer and supplier bargaining powers. If customers' bargaining power gets too strong, they can drive prices to unmanageably low levels or just refuse to buy the product or service. If a key supplier's bargaining power gets too strong, it can force the price of goods and services to unmanageably high levels or just starve a business by controlling the flow of parts or raw materials essential to the manufacture of a product.

Figure 2.2 also illustrates that businesses can counter the threats of competitive forces that they face by implementing one or more of the five basic **competitive strategies**.

- **Cost Leadership Strategy.** Becoming a low-cost producer of products and services in the industry or finding ways to help suppliers or customers reduce their costs or increase the costs of competitors.
- **Differentiation Strategy.** Developing ways to differentiate a firm's products and services from those of its competitors or reduce the differentiation advantages of competitors. This strategy may allow a firm to focus its products or services to give it an advantage in particular segments or niches of a market.
- **Innovation Strategy.** Finding new ways of doing business. This strategy may involve developing unique products and services or entering unique markets or market niches. It may also involve making radical changes to the business processes for producing or distributing products and services that are so different from the way a business has been conducted that they alter the fundamental structure of an industry.
- **Growth Strategies.** Significantly expanding a company's capacity to produce goods and services, expanding into global markets, diversifying into new products and services, or integrating into related products and services.
- **Alliance Strategies.** Establishing new business linkages and alliances with customers, suppliers, competitors, consultants, and other companies. These linkages may include mergers, acquisitions, joint ventures, formation of virtual companies, or other marketing, manufacturing, or distribution agreements between a business and its trading partners.

One additional point regarding these strategies is that they are not mutually exclusive. An organization may make use of one, some, or all of the strategies in varying degrees to manage the forces of competition. Therefore, a given activity could fall into one or more of the categories of competitive strategy. For example, implementing a system that allows customers to track their orders or shipments online could be considered a form of differentiation if the other competitors in the marketplace do not offer this service. If they do offer the service, however, online order tracking would not serve to differentiate one organization from another.

If an organization offers its online package tracking system in a manner that allows its customers to access shipment information via not only a computer but a mobile phone as well, then such an action could fall into both the differentiation and innovation strategy categories. Think of it this way: Not everything innovative will serve to differentiate one organization from another. Likewise, not everything that serves to differentiate organizations is necessarily viewed as innovative. These types of observations are true for any combination of the competitive strategies, thus making them complementary to each other rather than mutually exclusive.

How can business managers use investments in information technology to support a firm's competitive strategies? Figure 2.3 answers this question with a summary of the many ways that information technology can help a business implement the five basic competitive strategies. Figure 2.4 provides examples of how specific companies have used strategic information systems to implement each of these five basic strategies for competitive advantage. Note the major use of Internet technologies for e-business and e-commerce applications. In the rest of this chapter, we discuss and provide examples of many strategic uses of information technology.

Other Strategic Initiatives

While Porter's Five Forces (as shown in Figure 2.2) are considered the basic foundation for understanding business strategy, there are many strategic initiatives available to a firm in addition to the five basic strategies of cost leadership, differentiation, innovation,

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**STRATEGIC USES
 OF INFORMATION
 TECHNOLOGY**
 LO 2-3

FIGURE 2.3

A summary of how information technology can be used to implement the five basic competitive strategies. Many companies are using Internet technologies as the foundation for such strategies.

Basic Strategies in the Business Use of Information Technology	
Lower Costs	<ul style="list-style-type: none"> Use IT to substantially reduce the cost of business processes. Use IT to lower the costs of customers or suppliers.
Differentiate	<ul style="list-style-type: none"> Develop new IT features to differentiate products and services. Use IT features to reduce the differentiation advantages of competitors. Use IT features to focus products and services at selected market niches.
Innovate	<ul style="list-style-type: none"> Create new products and services that include IT components. Develop unique new markets or market niches with the help of IT. Make radical changes to business processes with IT that dramatically cut costs; improve quality, efficiency, or customer service; or shorten time to market.
Promote Growth	<ul style="list-style-type: none"> Use IT to manage regional and global business expansion. Use IT to diversify and integrate into other products and services.
Develop Alliances	<ul style="list-style-type: none"> Use IT to create virtual organizations of business partners. Develop interenterprise information systems linked by the Internet and extranets that support strategic business relationships with customers, suppliers, subcontractors, and others.

growth, and alliance. Let's look at several key strategies that can also be implemented with information technology. They include locking in customers or suppliers, building switching costs, raising barriers to entry, and leveraging investment in information technology.

Investments in information technology can allow a business to **lock in customers and suppliers** (and therefore lock out competitors) by building valuable new relationships with them. These business relationships can become so valuable to customers or suppliers that they deter them from abandoning a company for its competitors or intimidate them into accepting less profitable business arrangements. Early attempts to use information systems technology in these relationships focused on significantly improving the quality of service to customers and suppliers in a firm's distribution,

FIGURE 2.4

Examples of how, over time, companies have used information technology to implement five competitive strategies for strategic advantage.

Strategy	Company	Strategic Use of Information Technology	Business Benefit
Cost Leadership	Dell Computer Priceline.com eBay.com	Online build to order Online seller bidding Online auctions	Lowest-cost producer Buyer-set pricing Auction-set prices
Differentiation	AVNET Marshall Moen Inc. Consolidated Freightways	Customer/supplier of e-commerce Online customer design Customer online shipment tracking	Increase in market share Increase in market share Increase in market share
Innovation	Charles Schwab & Co. Federal Express Amazon.com	Online discount stock trading Online package tracking and flight management Online full-service customer systems	Market leadership Market leadership Market leadership
Growth	Citicorp Walmart Toys 'R' Us Inc.	Global intranet Merchandise ordering by global satellite network POS inventory tracking	Increase in global market Market leadership Market leadership
Alliance	Walmart/Procter & Gamble Cisco Systems Staples Inc. and Partners	Automatic inventory replenishment by supplier Virtual manufacturing alliances Online one-stop shopping with partners	Reduced inventory cost/ increased sales Agile market leadership Increase in market share

Other Strategic Uses of Information Technology

- Develop interenterprise information systems whose convenience and efficiency create switching costs that lock in customers or suppliers.
- Make major investments in advanced IT applications that build barriers to entry against industry competitors or outsiders.
- Include IT components in products and services to make substitution of competing products or services more difficult.
- Leverage investment in IS people, hardware, software, databases, and networks from operational uses into strategic applications.

FIGURE 2.5

Additional ways that information technology can be used to implement competitive strategies.

marketing, sales, and service activities. More recent projects characterize a move toward more innovative uses of information technology.

A major emphasis in strategic information systems has been to find ways to **create switching costs** in the relationships between a firm and its customers or suppliers. In other words, investments in information systems technology can make customers or suppliers dependent on the continued use of innovative, mutually beneficial interenterprise information systems. They then become reluctant to pay the costs in time, money, effort, and inconvenience that it would take to switch to a company's competitors.

By making investments in information technology to improve its operations or promote innovation, a firm could also **raise barriers to entry** that would discourage or delay other companies from entering a market. Typically, these barriers increase the amount of investment or the complexity of the technology required to compete in an industry or a market segment. Such actions tend to discourage firms already in the industry and deter external firms from entering the industry.

Investing in information technology enables a firm to build strategic IT capabilities so that they can take advantage of opportunities when they arise. In many cases, this happens when a company invests in advanced computer-based information systems to improve the efficiency of its own business processes. Then, armed with this strategic technology platform, the firm can **leverage investment in IT** by developing new products and services that would not be possible without a strong IT capability. An important current example is the development of corporate intranets and extranets by many companies, which enables them to leverage their previous investments in Internet browsers, PCs, servers, and client/server networks. Figure 2.5 summarizes the additional strategic uses of IT we have just discussed.

Hitting “Ctrl+P” can cost your business more than you think. It certainly did at aerospace giant Boeing. Imaging services—which includes production printing, office printing, faxing, scanning, and related supplies—used to cost the company nearly \$150 million annually. The problem, says Earl Beauvais, Boeing's director of print, plot, and scan services, was that imaging wasn't centrally controlled, and the company used several vendors. Boeing also owned, operated, and maintained about 32,000 imaging devices. The lack of an enterprise-wide solution meant, among other things, that each department was responsible for purchasing its own toner, paper, and other supplies.

To increase efficiency and reduce cost, Beauvais and his team sought a managed services solution to handle everything from print cartridges to printer upkeep across Boeing's 195 domestic sites and 168 international sites. Beauvais spent 18 months researching and interviewing vendors, who had to show how they would manage the company's imaging technology needs while providing the greatest efficiency at the best price. He and his team chose a partnership comprising Dell (for maintenance and asset management) and Lexmark (for devices). They picked them in part because Dell had infrastructure in place at Boeing.

Boeing: Saving Big by Cutting Imaging Costs

To prove the concept, a six-month pilot implementation launched at Boeing's St. Louis office in May 2007. The St. Louis system included 47 new Lexmark device categories, including printers, copy machines, and scanners. "We replaced the devices because we didn't want variability of age," says Beauvais.

The beauty of managed services is that Dell owns the devices and handles maintenance, a key goal for Beauvais.

Boeing saw ROI immediately because Dell's service contract cost less than its existing agreements. In the end, Boeing saved about 30 percent of its imaging maintenance and supplies costs, and 27 percent of its overall imaging costs annually at locations with the new system. The initiative began rolling out companywide at the end of 2007.

For Boeing, the benefits couldn't be clearer. Beauvais's staff can now focus more on other business needs, and the company's total imaging spending has been reduced to \$110 million annually. Both will aid Boeing as it navigates a turbulent economy.

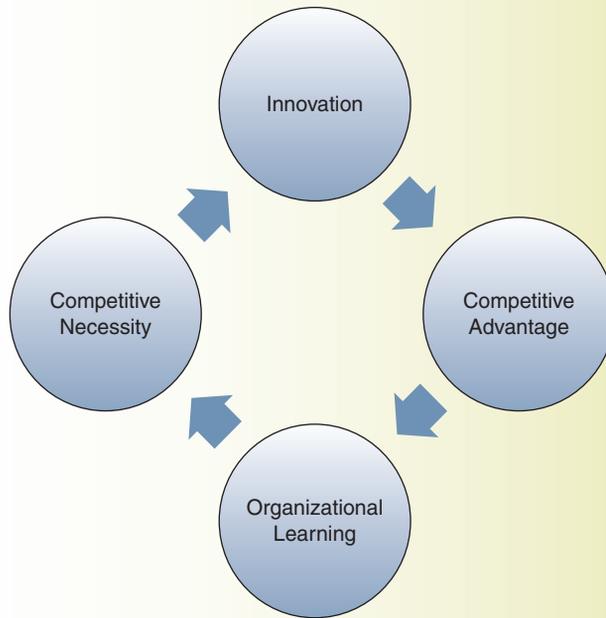
SOURCE: Adapted from Jarina D'Auria, "Boeing Saves Big by Cutting Imaging Costs," *CIO.com*, March 25, 2009.

Competitive Advantage and Competitive Necessity

The constant struggle to achieve a measurable competitive advantage in an industry or marketplace occupies a significant portion of an organization's time and money. Creative and innovative marketing, research and development, and process reengineering, among many other activities, are used to gain that elusive and sometimes indescribable competitive advantage over rival firms.

The term *competitive advantage* is often used when referring to a firm that is leading an industry in some identifiable way such as sales, revenues, or new products. In fact, the definition of the term suggests a single condition under which competitive advantage can exist: When a firm sustains profits that exceed the average for its industry, the firm is said to possess competitive advantage over its rivals. In other words, competitive advantage is all about profits. Of course, sales, revenues, cost management, and new products all contribute in some way to profits, but unless the contribution results in sustained profits above the average for the industry, no measurable competitive advantage has been achieved. The real problem with a competitive advantage, however, is that it normally doesn't last very long and is generally not sustainable over the long term. Figure 2.6 illustrates this cycle. Once a firm figures out how to gain an advantage over its competitors (normally through some form of innovation), the competitors figure out how it was done through a process referred to as organizational learning. To combat the competitive advantage, they adopt the same, or some similar, innovation. Once this occurs, everyone in the industry is doing what everyone else is doing; what was once a competitive advantage is now a competitive necessity. Instead of creating an advantage, the strategy or action becomes necessary to compete and do business in the industry. When this happens, someone has to figure out a new way to gain a competitive edge, and the cycle starts all over again.

Every organization is looking for a way to gain competitive advantage, and many have successfully used strategic information systems to help them achieve it. The important point to remember is that no matter how it is achieved, competitive advantage doesn't last forever. Arie de Geus, head of strategic planning for Royal Dutch Shell, thinks there may be one way to sustain it: "The ability to learn faster than your competitors may be the only sustainable competitive advantage in the future." This suggests an important role for information systems if any competitive advantage is to be achieved.

**FIGURE 2.6**

The move from innovation to competitive advantage quickly becomes competitive necessity when other firms learn how to respond strategically.

The driving force behind world economic growth has changed from manufacturing volume to improving customer value. As a result, the key success factor for many firms is maximizing customer value.

For many companies, the chief business value of becoming a customer-focused business lies in its ability to help them keep customers loyal, anticipate their future needs, respond to customer concerns, and provide top-quality customer service. This strategic focus on **customer value** recognizes that quality, rather than price, has become the primary determinant in a customer's perception of value. Companies that consistently offer the best value from the customer's perspective are those that keep track of their customers' individual preferences; keep up with market trends; supply products, services, and information anytime and anywhere; and provide customer services tailored to individual needs. Thus, Internet technologies have created a strategic opportunity for companies, large and small, to offer fast, responsive, high-quality products and services tailored to individual customer preferences.

Internet technologies can make customers the focal point of customer relationship management (CRM) and other e-business applications. In combination, CRM systems and Internet, intranet, and extranet Web sites create new channels for interactive communications within a company, as well as communication with customers, suppliers, business partners, and others in the external environment. Such communications enable continual interaction with customers by most business functions and encourage cross-functional collaboration with customers in product development, marketing, delivery, service, and technical support. We will discuss CRM systems in Chapter 8.

Typically, customers use the Internet to ask questions, lodge complaints, evaluate products, request support, and make and track their purchases. Using the Internet and corporate intranets, specialists in business functions throughout the enterprise can contribute to an effective response. This ability encourages the creation of cross-functional discussion groups and problem-solving teams dedicated to customer involvement, service, and support. Even the Internet and extranet links to suppliers and business partners can be used to enlist them in a way of doing business that ensures the prompt delivery of quality components and services to meet a company's commitments to its customers. This process is how a business demonstrates its focus on customer value.

BUILDING A CUSTOMER-FOCUSED BUSINESS

LO 2-2

FIGURE 2.7

How a customer-focused business builds customer value and loyalty using Internet technologies.

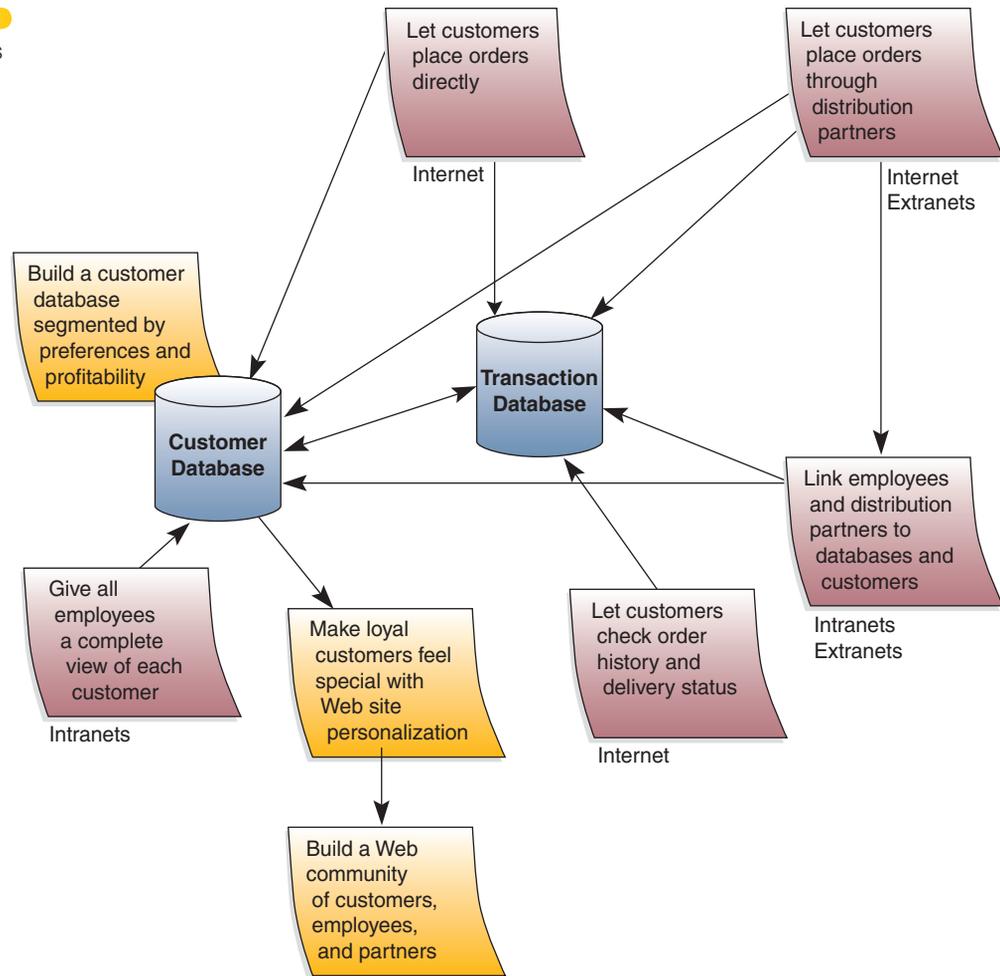


Figure 2.7 illustrates the interrelationships in a customer-focused business. Intranets, extranets, e-commerce Web sites, and Web-enabled internal business processes form the invisible IT platform that supports this e-business model. The platform enables the business to focus on targeting the kinds of customers it really wants and “owning” the customer’s total business experience with the company. A successful business streamlines all business processes that affect its customers and develops CRM systems that provide its employees with a complete view of each customer, so they have the information they need to offer their customers top-quality personalized service. A customer-focused business helps its e-commerce customers help themselves while also helping them do their jobs. Finally, a successful business nurtures an online community of customers, employees, and business partners that builds great customer loyalty as it fosters cooperation to provide an outstanding customer experience. Let’s review a real-world example.

Universal Orlando: IT Decisions Driven by Customer Data

Michelle McKenna is the CIO of Universal Orlando Resort, but she is also a mother of two and the planner of family vacations.

In fact, she thinks of herself first as a theme park customer, second as a senior leader at Universal, and finally as the company’s CIO. “Recently we were brainstorming new events that would bring more Florida residents to our theme parks during off-peak tourist periods. Our in-house marketing group was pitching proposals, and I offered the idea of a Guitar Hero competition. Everyone loved it. But that idea didn’t come from being a CIO—it came from being a mother of two,” she says.

“Thinking like our customers and focusing on our company’s markets are among the most important ways we can fulfill our responsibility to contribute to informed decision making,” says McKenna. Moving forward, it’s more critical than ever for CIOs to study market trends and find ways to maximize business opportunities.

Universal Orlando is one of many brands in the travel and entertainment industry competing for discretionary dollars spent by consumers on leisure time and vacations. Of course, the competition boils down to a market of one—the individual consumer. People often assume that because of the high volume of guests, the experience at Universal Orlando has to be geared for the masses. But digital technology now enables guests to customize their experience. For example, the new Hollywood Rip Ride RockIt Roller Coaster will allow guests to customize their ride experience by choosing the music that plays around them while on the roller coaster. When the ride ends, guests will be able to edit video footage of that experience into a music video to keep, share with friends, or post online.

Any CIO can take a few steps to get market savvy. Management gets weekly data about what happened in the park and what the spending trends are per guest. CIOs should get copied on any reports like that. They should study them and look for patterns. “Don’t be afraid to ask questions about it; give yourself permission to be a smart (and inquisitive) businessperson. When I first joined the company and asked about market issues, people looked at me and thought, ‘Why did she ask that? It doesn’t have anything to do with technology.’ Over time they realized that I needed to understand our data in order to do my job,” says McKenna.

Knowledge of market data helps Universal Orlando drill down to understand what is really happening in business. For example, trends indicated that annual pass holders—Florida residents, primarily—spend less on food, merchandise, and other items than day-pass guests.

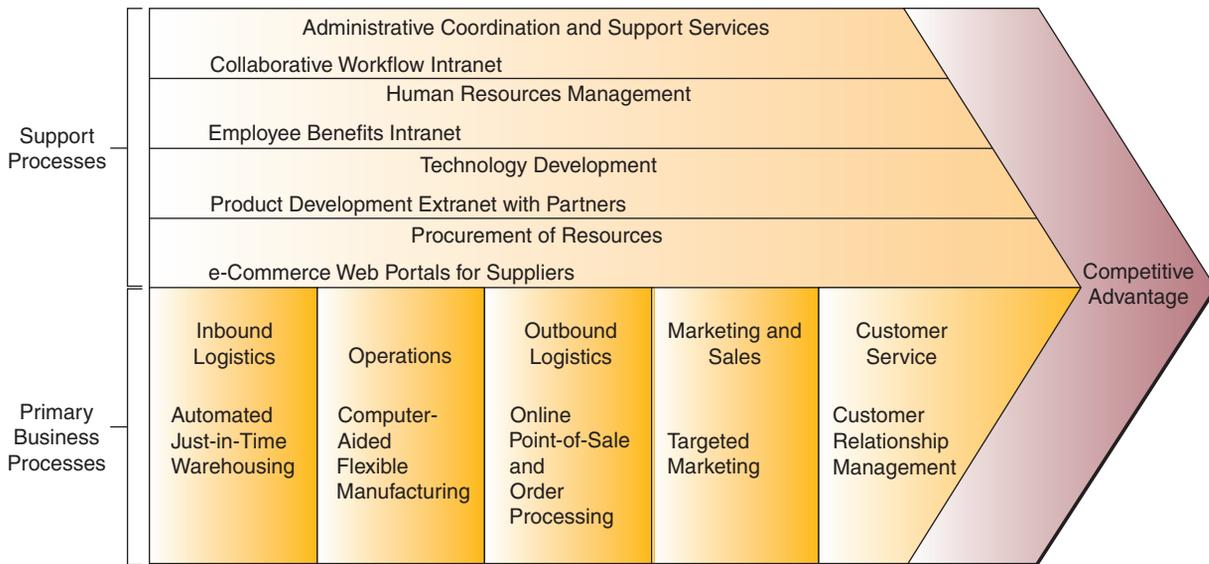
It turned out that some pass holders do spend on par with day guests, particularly when they attend special events, Mardi Gras, and Halloween Horror Nights. “This analysis showed that we needed to segment those annual pass holders more deeply in order to better understand them and market to them. So we are building a new data warehouse and business intelligence tools that will calculate spending by hour and by pass type. The initiative started in IT, and we can find many similar opportunities if we look at market details and ask questions,” McKenna says.

SOURCE: Adapted from Michelle McKenna, “Customer Data Should Drive IT Decisions,” *CIO Magazine*, June 2, 2008.

Let’s look at another important concept that can help you identify opportunities for strategic information systems. The *value chain* concept, developed by Michael Porter, is illustrated in Figure 2.8. It views a firm as a series, chain, or network of basic activities that add value to its products and services and thus add a margin of value to both the firm and its customers. In the value chain conceptual framework, some business activities are primary processes; others are support processes. *Primary processes* are those business activities that are directly related to the manufacture of products or the delivery of services to the customer. In contrast, *support processes* are those business activities that help support the day-to-day operation of the business and that indirectly contribute to the products or services of the organization. This framework can highlight where competitive strategies can best be applied in a business. So managers and business professionals should try to develop a variety of strategic uses of the Internet and other technologies for those basic processes that add the most value to a company’s products or services and thus to the overall business value of the company.

THE VALUE CHAIN AND STRATEGIC IS

LO 2-1

**FIGURE 2.8**

The value chain of a firm. Note the examples of the variety of strategic information systems that can be applied to a firm's basic business processes for competitive advantage.

Value Chain Examples

Figure 2.8 provides examples of how and where information technologies can be applied to basic business processes using the value chain framework. For example, the figure illustrates that collaborative workflow intranets can increase the communications and collaboration required to improve administrative coordination and support services dramatically. An employee benefits intranet can help the human resources management function provide employees with easy, self-service access to their benefits information. Extranets enable a company and its global business partners to use the Web to design products and processes jointly. Finally, e-commerce Web portals can dramatically improve procurement of resources by providing online marketplaces for a firm's suppliers.

The value chain model in Figure 2.8 also identifies examples of strategic applications of information systems technology to primary business processes. These include automated just-in-time warehousing systems to support inbound logistic processes that involve inventory storage, computer-aided flexible manufacturing systems, as well as online point-of-sale and order processing systems to improve the outbound logistics processes that handle customer orders. Information systems can also support marketing and sales processes by developing an interactive targeted marketing capability on the Internet and the Web. Finally, a coordinated and integrated customer relationship management system can dramatically improve customer service.

Thus, the value chain concept can help you identify where and how to apply the strategic capabilities of information technology. It shows how various types of information technologies might be applied to specific business processes to help a firm gain competitive advantages in the marketplace.

Using Information Technology for Strategic Advantage

Organizations may view and use information technology in many ways. For example, companies may choose to use information systems strategically, or they may be content to use IT to support efficient everyday operations. If a company emphasized strategic business uses of information technology, its management would view IT as a major competitive differentiator. They would then devise business strategies that use IT to develop products, services, and capabilities that give the company major advantages in the markets in which it competes. In this section, we provide many examples of such strategic business applications of information technology. See Figure 2.9.

STRATEGIC USES OF IT

One of the most important implementations of competitive strategies is **business process reengineering** (BPR), often simply called *reengineering*. Reengineering is a fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in cost, quality, speed, and service. BPR combines a strategy of promoting business innovation with a strategy of making major improvements to business processes so that a company can become a much stronger and more successful competitor in the marketplace.

REENGINEERING BUSINESS PROCESSES LO 2-3

However, Figure 2.10 points out that although the potential payback of reengineering is high, so too is its risk of failure and level of disruption to the organizational environment. Making radical changes to business processes to dramatically improve efficiency and effectiveness is not an easy task. For example, many companies have used cross-functional enterprise resource planning (ERP) software to reengineer, automate, and integrate their manufacturing, distribution, finance, and human resource business processes. Although many companies have reported impressive gains with such ERP reengineering projects, many others either have experienced dramatic failures or did not achieve the improvements they sought.

Many companies have found that *organizational redesign* approaches are an important enabler of reengineering, along with the use of information technology. For



SOURCE: © The McGraw-Hill Companies Inc./John Flournoy.

FIGURE 2.9

Companies of all sizes can benefit from using smartphones to improve their business processes.

FIGURE 2.10

Some of the key ways that business process reengineering differs from business improvement.

	Business Improvement	Business Process Reengineering
Level of Change	Incremental	Radical
Process Change	Improved new version of process	Brand-new process
Starting Point	Existing processes	Clean slate
Frequency of Change	One-time or continuous	Periodic one-time change
Time Required	Short	Long
Typical Scope	Narrow, within functions	Broad, cross-functional
Horizon	Past and present	Future
Participation	Bottom-up	Top-down
Path to Execution	Cultural	Cultural, structural
Primary Enabler	Statistical control	Information technology
Risk	Moderate	High

SOURCE: Adapted from Howard Smith and Peter Fingar, *Business Process Management: The Third Wave* (Tampa, FL: Meghan-Kiffer Press, 2003), p. 118.

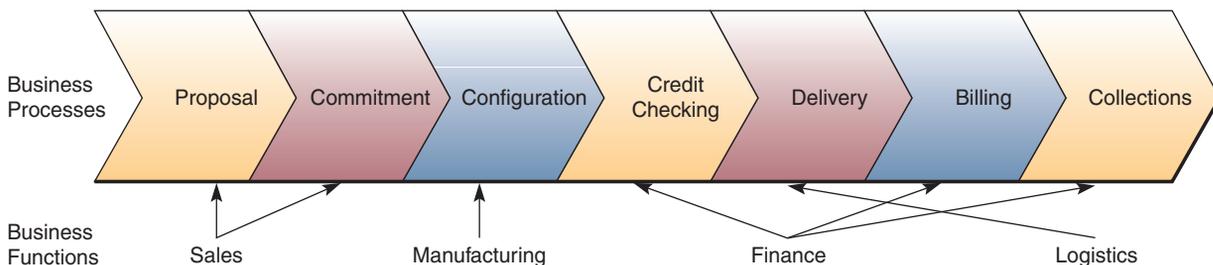
example, one common approach is the use of self-directed cross-functional or multi-disciplinary *process teams*. Employees from several departments or specialties, including engineering, marketing, customer service, and manufacturing, may work as a team on the product development process. Another example is the use of *case managers*, who handle almost all tasks in a business process instead of splitting tasks among many different specialists.

The Role of Information Technology

Information technology plays a major role in reengineering most business processes. The speed, information-processing capabilities, and connectivity of computers and Internet technologies can substantially increase the efficiency of business processes, as well as communications and collaboration among the people responsible for their operation and management. For example, the order management process illustrated in Figure 2.11 is vital to the success of most companies. Many of them are reengineering this process with ERP software and Web-enabled e-business and e-commerce systems, as outlined in Figure 2.12.

FIGURE 2.11

The order management process consists of several business processes and crosses the boundaries of traditional business functions.



Reengineering Order Management

- Customer relationship management systems using corporate intranets and the Internet.
- Supplier-managed inventory systems using the Internet and extranets.
- Cross-functional ERP software for integrating manufacturing, distribution, finance, and human resource processes.
- Customer-accessible e-commerce Web sites for order entry, status checking, payment, and service.
- Customer, product, and order status databases accessed via intranets and extranets by employees and suppliers.

FIGURE 2.12

Examples of information technologies that support reengineering the order management processes.

To build or to buy? Software, that is. This is one of the most enduring, persistent questions in the world of IT. Should a company license (i.e., buy) a commercial application that will do 75 percent of what is needed, or should it develop its own applications that will support the requirements as closely as possible? The traditional answer has been that one buys to standardize—that is, to automate necessary but not strategic business processes—and builds to compete—that is, to support those core processes that make your company different from its competitors.

But things may be more complicated than that. In some cases, homegrown systems may currently be handling menial, less-than-strategic tasks, but switching costs make it difficult to replace them with commercial software. In other cases, packaged software may do exactly what the company needs, even if those needs are strategic in nature. Then, why develop your own?

Many IT executives will evaluate commercial software before even considering building their own. Buying commercial software as often as possible frees up resources for those times when you really, really need to build your own software. When making those decisions, it is important to understand the entire life cycle of software applications and not only the development stage. Many applications will last at least seven or eight years, and due to ongoing maintenance and improvements, 70 percent of the costs will be incurred after the software has been officially implemented. It thus seems that buying or building may be much more complicated than previously thought.

Consider financial services giant Visa. Due to a major emphasis on security, reliability, and privacy concerns of its customers, Visa has an IT organization that is historically biased toward building in-house. This is also due to the sheer size of their global financial network—when you are that large, there is really nobody else you can turn to; all other provider organizations are small in comparison, and the benefits are just not there. However, even an IT organization that traditionally builds can turn to commercial software—even open-source software, of all things—when the economics make sense. Infrastructure and tools are just an example.

“They work, and there is no competitive advantage to build,” says David Allen, a consultant who served as Visa’s CTO for three years. “Those systems are built at a scale because you’re leveraging the technology across many companies.” Further, the the company has embraced the availability of mature and reliable open-source tools, particularly in areas such as development, databases, and programming languages. “The combination of low-cost tools and having the source code available can be like getting the best of both worlds [of buying and building],” Allen says. “We have gotten as good if not better in deploying new services on open source as on commercially available software like Windows.”

To Build or to Buy—Is That Really the Question?

The best bet may be to put together all available data about business processes, assets and requirements, people, software, hardware, architecture, and compliance and present it with detailed alternatives—each with its advantages and disadvantages, benefits and consequences—to the business stakeholders, and let them make that decision. Inevitably, however, politics will raise its ugly head sooner or later.

SOURCE: Adapted from Traylor, P. “To build or to buy IT applications?” *InfoWorld*, February 13, 2006.

**BECOMING AN
AGILE COMPANY**
LO 2-4

We are changing from a competitive environment in which mass-market products and services were standardized, long-lived, information-poor, and exchanged in one-time transactions, to an environment in which companies compete globally with niche market products and services that are individualized, short-lived, information-rich, and exchanged on an ongoing basis with customers.

To be an **agile company**, a business must use four basic strategies. First, the business must ensure that customers perceive the products or services of an agile company as solutions to their individual problems. Thus, it can price products on the basis of their value as solutions, rather than their cost to produce. Second, an agile company cooperates with customers, suppliers, other companies, and even with its competitors. This cooperation allows a business to bring products to market as rapidly and cost-effectively as possible, no matter where resources are located or who owns them. Third, an agile company organizes so that it thrives on change and uncertainty. It uses flexible organizational structures keyed to the requirements of different and constantly changing customer opportunities. Fourth, an agile company leverages the impact of its people and the knowledge they possess. By nurturing an entrepreneurial spirit, an agile company provides powerful incentives for employee responsibility, adaptability, and innovation.

Figure 2.13 summarizes another useful way to think about agility in business. This framework emphasizes the roles that customers, business partners, and information technology can play in developing and maintaining the strategic agility of a company. Notice how information technology can enable a company to develop relationships

FIGURE 2.13

How information technology can help a company be an agile competitor, with the help of customers and business partners.

Type of Agility	Description	Role of IT	Example
Customer	Ability to co-opt customers in the exploitation of innovation opportunities <ul style="list-style-type: none"> • As sources of innovation ideas • As co-creators of innovation • As users in testing ideas or helping other users learn about the idea 	Technologies for building and enhancing virtual customer communities for product design, feedback, and testing	eBay customers are its de facto product development team because they post an average of 10,000 messages each week to share tips, point out glitches, and lobby for changes
Partnering	Ability to leverage assets, knowledge, and competencies of suppliers, distributors, contract manufacturers, and logistics providers in the exploration and exploitation of innovation opportunities	Technologies facilitating interfirm collaboration, such as collaborative platforms and portals, supply chain systems	Yahoo! has accomplished a significant transformation of its service from a search engine into a portal by initiating numerous partnerships to provide content and other media-related services from its Web site
Operational	Ability to accomplish speed, accuracy, and cost economy in the exploitation of innovation opportunities	Technologies for modularization and integration of business processes	Ingram Micro, a global wholesaler, has deployed an integrated trading system allowing its customers and suppliers to connect directly to its procurement and ERP systems

SOURCE: Adapted from V. Sambamurthy, Anandhi Bhaharadwaj, and Varun Grover, “Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms,” *MIS Quarterly*, June 2003, p. 246.

with its customers in virtual communities that help it be an agile innovator. As we will see repeatedly throughout this textbook, information technologies enable a company to partner with its suppliers, distributors, contract manufacturers, and others via collaborative portals and other Web-based supply chain systems that significantly improve its agility in exploiting innovative business opportunities.

In today's dynamic global business environment, forming a *virtual company* can be one of the most important strategic uses of information technology. A virtual company (also called a *virtual corporation* or *virtual organization*) is an organization that uses information technology to link people, organizations, assets, and ideas.

Figure 2.14 illustrates that virtual companies typically form virtual workgroups and alliances with business partners that are interlinked by the Internet, intranets, and extranets. Notice that this company has organized internally into clusters of process and cross-functional teams linked by intranets. It has also developed alliances and extranet links that form *interenterprise information systems* with suppliers, customers, subcontractors, and competitors. Thus, virtual companies create flexible and adaptable virtual workgroups and alliances keyed to exploit fast-changing business opportunities.

Virtual Company Strategies

Why do people form virtual companies? It is the best way to implement key business strategies and alliances that promise to ensure success in today's turbulent business climate. Several major reasons for virtual companies stand out and are summarized in Figure 2.15.

For example, a business may not have the time or resources to develop the necessary manufacturing and distribution infrastructure, personnel competencies, and information technologies to take full advantage of a new market opportunity in a timely manner. It can assemble the components it needs to provide a world-class solution for customers and capture the market opportunity only by quickly forming a virtual company through a strategic alliance of all-star partners. Today, of course, the Internet, intranets, extranets, and a variety of other Internet technologies are vital components in creating such successful solutions.

CREATING A VIRTUAL COMPANY

LO 2-4

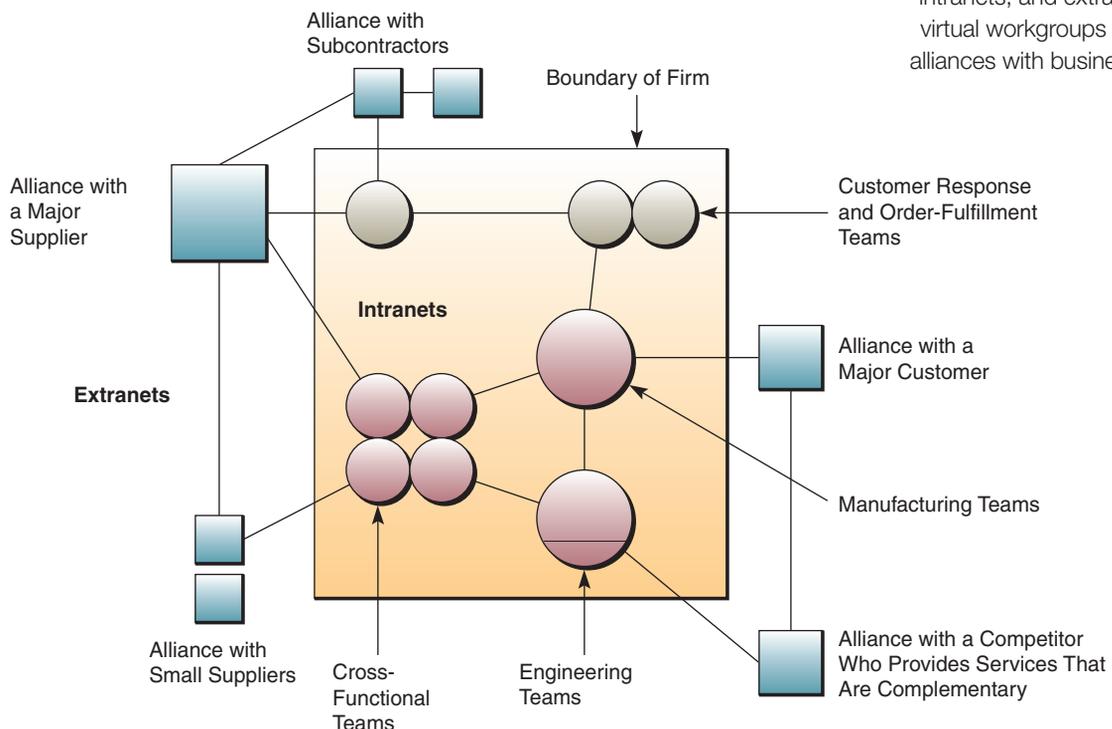


FIGURE 2.14
A virtual company uses the Internet, intranets, and extranets to form virtual workgroups and support alliances with business partners.

FIGURE 2.15

The basic business strategies of virtual companies.

Strategies of Virtual Companies
• Share infrastructure and risk with alliance partners.
• Link complementary core competencies.
• Reduce concept-to-cash time through sharing.
• Increase facilities and market coverage.
• Gain access to new markets and share market or customer loyalty.
• Migrate from selling products to selling solutions.

Sysco: Transforming a Company with the Help of IT

Sysco, headquartered in Houston, Texas, is a major distributor of food products to restaurants, schools, hospitals, and hotels and is also a provider of equipment and supplies to the hospitality and food service industries. Sysco employs approximately 45,000 with sales for the 2010 fiscal year surpassing \$37 billion. It operates more than 180 locations in the United States, Canada, and Ireland, from which it serves more than 400,000 customers. The company is organized into a series of large operating companies with geographical responsibilities, and a smaller group of specialty food companies that cater to particular segments of the market.

Sysco has embarked on a new project to standardize and unify business processes across its operating companies and distribution centers. The overarching goals of the effort are to increase efficiency and improve sales and marketing, as well as provide increased transparency through improved data management. Not surprisingly, IT is an integral part of this transformation.

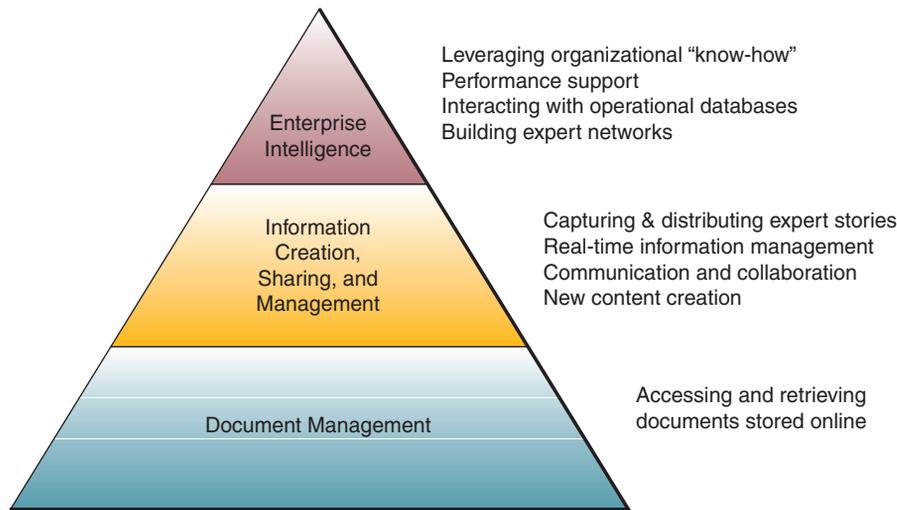
“This is more than an IT project—it is truly a business transformation,” says Jim Hope, executive vice president. “Using the power of SAP as the foundation for our transformation, Sysco intends to improve productivity, retain and expand business with existing customers, and understand where market opportunities lie so we can do a better job attracting and pursuing new business.”

The company chose SAP Business Suite and Business Objects business intelligence platforms as the centerpieces after a series of pilots and demonstrations convinced senior management this was the way to go. As everybody in IT knows, one of the most important keys to the success of this kind of large project is executive commitment. And so Sysco started by getting this first, and then figuring out the details later. “We’re starting to pilot some of the customer-facing applications, and in particular, an improved ordering platform for our customers,” said Mark Palmer, vice president of corporate communication. “So far, we’re very happy with what we’re seeing.”

These “details” include a four-pronged approach focused on getting more and better information into the hands of their sales associates (Sysco’s main point of contact with customers), a Web-based complete order management system that will also assist customers with personalized recommendations, a consolidated back office that will be shared by all affiliates, and standardized reporting across the company that will provide management with up-to-date information on all aspects of operations. And all this will be done with commercial software that will replace existing stand-alone systems that just could not deliver anymore.

“We have a tremendous opportunity to use technology to continue to sharpen our operations,” says Twila Day, senior vice president and chief information officer. “SAP is the best technology provider to help us with our plans to integrate all of our software needs into a single platform, giving us the visibility required to efficiently manage our business end-to-end.”

SOURCE: Adapted from Schneider, I. “Sysco Taps SAP For BI, CRM,” *InformationWeek*, May 6, 2010 and www.sysco.com, accessed May 9, 2011.



SOURCE: Adapted from Marc Rosenberg, *e-Learning: Strategies for Delivering Knowledge in the Digital Age* (New York: McGraw-Hill, 2001), p. 70.

In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge. When markets shift, technologies proliferate, competitors multiply, and products become obsolete almost overnight, successful companies are those that consistently create new knowledge, disseminate it widely throughout the organization, and quickly embody it in new technologies and products. These activities define the “knowledge-creating” company, whose sole business is continuous innovation.

Many companies today can only realize lasting competitive advantage if they become knowledge-creating companies or learning organizations. That means consistently creating new business knowledge, disseminating it widely throughout the company, and quickly building the new knowledge into their products and services.

Knowledge-creating companies exploit two kinds of knowledge. One is *explicit knowledge*, which is the data, documents, and things written down or stored on computers. The other kind is *tacit knowledge*, or the “how-tos” of knowledge, which resides in workers. Tacit knowledge can often represent some of the most important information within an organization. Long-time employees of a company often “know” many things about how to manufacture a product, deliver the service, deal with a particular vendor, or operate an essential piece of equipment. This tacit knowledge is not recorded or codified anywhere because it has evolved in the employee’s mind through years of experience. Furthermore, much of this tacit knowledge is never shared with anyone who might be in a position to record it in a more formal way because there is often little incentive to do so or simply, “Nobody ever asked.”

As illustrated in Figure 2.16, successful knowledge management creates techniques, technologies, systems, and rewards for getting employees to share what they know and make better use of accumulated workplace and enterprise knowledge. In that way, employees of a company are leveraging knowledge as they do their jobs.

Making personal knowledge available to others is the central activity of the knowledge-creating company. It takes place continuously and at all levels of the organization.

Knowledge management has thus become one of the major strategic uses of information technology. Many companies are building **knowledge management systems (KMS)** to manage organizational learning and business know-how. The goal of such systems is to help knowledge workers create, organize, and make available important business knowledge, wherever and whenever it’s needed in an organization. This information includes processes, procedures, patents, reference works, formulas, best practices, forecasts, and fixes. As you will see in Chapter 10, Internet and intranet Web

FIGURE 2.16

Knowledge management can be viewed as three levels of techniques, technologies, and systems that promote the collection, organization, access, sharing, and use of workplace and enterprise knowledge.

BUILDING A KNOWLEDGE-CREATING COMPANY

LO 2-5

KNOWLEDGE MANAGEMENT SYSTEMS

sites, groupware, data mining, knowledge bases, and online discussion groups are some of the key technologies that may be used by a KMS.

Knowledge management systems also facilitate organizational learning and knowledge creation. They are designed to provide rapid feedback to knowledge workers, encourage behavior changes by employees, and significantly improve business performance. As the organizational learning process continues and its knowledge base expands, the knowledge-creating company works to integrate its knowledge into its business processes, products, and services. This integration helps the company become a more innovative and agile provider of high-quality products and customer services, as well as a formidable competitor in the marketplace. Now let's close this chapter with an example of knowledge management strategies from the real world.

Goodwin Procter Makes a Strong Case for Knowledge Management

If anyone knows that time is money, it's an attorney. The 850 attorneys and their staff at Goodwin Procter LLP were spending too much time assembling documents and looking up information, which meant cases took more time than they should to proceed. The \$611 million law firm's eight offices used seven different applications to manage more than 2 terabytes of data for Goodwin Procter's more than 60,000 cases—close to 10 million documents. CIO Peter Lane wanted to integrate the data. Using Microsoft SharePoint, his team created the Matter Page System as a hub through which attorneys could access business data and client information.

What's more, the firm has been able to use the platform to share its notes and work in progress. It's now easy for an attorney to find a colleague who can help with a similar case. Matter Pages took a year to implement, but it immediately changed how Goodwin Procter's attorneys work.

When a client called with a question, finding the answer used to mean launching more than one application and looking up the data in different systems. Attorneys needed contact information, documents, billing information, and more. The process sometimes took hours.

"Now, instead of having to launch the different systems from the desktop, or the Web interface, or the document management system, we were able to pull all of this information into a one-stop-shop view for the users in our company," says Andrew Kawa, Goodwin Procter's development manager, who leads its system development efforts.

The system increases efficiency for the attorneys because they can find previous matters that they or others have worked on and gain extra information much more quickly than before. They spend less time researching and more time moving a case forward. The initial success of Matter Pages has Lane investigating new SharePoint features, such as wikis and blogs. He expects to deploy these new capabilities widely over the next few months.

For example, each matter has a wiki that is used to track notes, or other unstructured data that relates to it. These notes are open for editing by all users. Blogs tend to be used for discussions that are not case-specific, although when a matter or set of matters apply to the topic of the blog, users can add links to related cases.

"One of the IT goals is to take advantage of the new technology as it becomes available," Lane adds. With that goal in mind, says Lane, the Matter Pages System won't ever truly be completed. Currently, Kawa is looking to integrate Goodwin Procter's patent and trademark information with data about their patent applications from the U.S. Patent and Trademark Office. The integration would allow attorneys to retrieve real-time information on their pending patents and actions they need to take. "I don't think we will ever declare the project done or say we don't have to put any more time or effort in," he says.

SOURCE: Adapted from Jarina D'Auria, "Goodwin Procter Makes Strong Case for Knowledge Management," *CIO.com*, August 1, 2008.



CenterPoint Properties— Reinventing a Company with the Help of IT

CenterPoint Properties is a large real estate company making the transition into a world-class provider of intermodal transportation and logistics solutions. Such a radical transformation in its business model requires major changes in all aspects of the organization, from capital structure and ownership to the underlying technologies needed to run the new business. And that is where IT comes in. The challenge for CenterPoint is how to best deploy new applications and functionality for a business model that is largely unique and innovative, while at the same time keeping the day-to-day aspects of the real estate business chugging along.

Early on, CenterPoint Properties realized that commercial software was not going to cut it, at least not completely. Although there is no shortage of good software on the market, most vendors typically focus on the more streamlined or commoditized part of the business: back-end processes. While those are certainly important, the company started looking for a solution that would provide all the functionality required by the new business model. “To be successful, we were going to have to buy what we could, develop what was unique and strategic, and then integrate it into a single system,” says Scott Zimmerman, Chief Information Officer at CenterPoint. Out of this vision, the CUB System (CenterPoint’s Universal Business System) was born.

Everyday real estate functions—the ones that are neither unique nor strategic—were addressed by implementing a leading real estate ERP package called Yardi. This allowed CenterPoint to benefit from a stable and well-tested platform that was very reliable and cost-efficient for the essential transactions that all real estate companies have to deal with, such as sending rent statements, writing and processing checks, and so on. Because the underlying technology on which Yardi was built (the Microsoft.NET framework) was compatible with CenterPoint’s infrastructure, developers were able to tap into the functionality of Yardi directly from other parts of CUB, thus allowing multiple applications to communicate with each other without human intervention. This was not as straightforward as it sounds; it was necessary to fly back and forth to Yardi’s offices in California, and have a number of distance meetings between developer teams. Nevertheless, the benefits outweighed those costs.

Today, large real estate projects are a team effort. Members of those teams may include CenterPoint employees—in Chicago or elsewhere—plus participants from the client company. Sometimes consultants to either of the two parties are also part of the team, and all of the various team members are likely to be geographically dispersed. In short, enabling collaboration is a key success driver for these efforts. To address this, CenterPoint developed a custom CRM (Customer Relationship Management) system on top of Microsoft’s SharePoint 2007 platform. While SharePoint 2007 takes care of the “plumbing” (hosting Web sites, security and access issues, and storing all data), CenterPoint focuses on creating the tools they need. These include a separate Web site and blog for each different project that team members can use to keep updated about new developments; the Web site and blog also function as a central repository of project information that everyone can access anywhere at any time. Instant Messaging and e-mail are integrated so that all members are kept up-to-date on any new development in the project in their preferred way. The system also handles routing and approval of documents to the proper parties, as well as managing a digital library of all documents in the project—which are thus also available anytime, anywhere.

The old saying that real estate is all about “location, location, location” also holds true for CenterPoint. In order to take advantage of the most recent breakthroughs on GIS (Geographic Information Systems) technology, CUB integrates GIS functionality with Microsoft’s Virtual Earth Web service. Executives can then analyze existing or potential properties by using maps and aerial images that are overlaid with demographic, market, census and economic data. These data can be rearranged to create maps exposing different aspects of the site, which are all color-coded. Examples include vacancy and rent levels, new sales and construction, sale prices in the area, population growth, age and income, and any other relevant market trends.

All of these pieces—and others still under development—are tied together by a common interface based on a mix of ASP.NET, AJAX and JavaScript. Having a single, unified “look and feel” for the application has contributed to greatly reduced training costs, as well as improved employee productivity. Indeed, the underlying goal behind the custom interface was to minimize the amount of searching

and clicking required before users could find what they were looking for. In CUB, 80 percent of the information is within one or fewer clicks of a mouse (fewer meaning that important data will be displayed in a pop-up window when a user hovers the pointer over an object). CUB also integrates RSS feeds so that users can get up-to-date information on important industry and market trends, and it implements enterprise search functionality in a single place: All data stores of the company can be searched with a single keyword search box at the top of the portal.

The key to this effort has been the ability (and willingness) to pick and choose the best technology for each job, and make them all work together. This best-of-breed approach provides CenterPoint with a unique set of applications well suited to their business needs; at the same time, the applications are highly modular and extensible for when those needs change—and they will change, that much is guaranteed. “CUB is less a story about implementing a single technology and more a case study of how to successfully integrate the best parts a given technology has to offer into a cohesive system using progressive design techniques and pragmatic analysis of problem domains to efficiently support a business strategy,” says Zimmerman.

While all of this was going on, CenterPoint Properties went private. In March 2006, the California Public Employees’ Retirement System (CalPers) agreed to purchase CenterPoint Properties. As the details of the deal were ironed out, one of the lead advisers to CalPers was not convinced: A relatively small Chicago firm with only a hundred employees would not be able to execute the vision that the executives had put in place—at least not in the time frame that was necessary for it to be successful. At that time, CenterPoint’s CEO asked the CIO to give a demonstration of CUB. That was all it took.

“Had CenterPoint not had the foresight to invest early in this system to support and drive our new business model, we wouldn’t have been able to go private and we’d be trading at \$25 per share [half of CalPers’ purchase price] like our competition instead of experiencing double-digit growth. It was the straw that broke the camel’s back,” says Mike Mullen, CEO.

CenterPoint has started to reap many of those benefits as CUB went online. The integrated nature of all data provided, as well as the efficient and automated processing of routine transactions in the background, has freed property managers to concentrate on the most value-added aspects of the business. Their productivity has markedly gone up, as well. Today, CenterPoint estimates its property managers are handling twice as much square footage as their counterparts in other real estate companies. Faster and more accurate decision making, coupled with increased deal volume per employee—both of which have been made possible by CUB—have had a major impact on business results. CenterPoint has increased the turnover rate for properties from five or six years to three, which doubled the transaction volume the company can handle from the properties in its portfolio. Since CUB was implemented, CenterPoint has increased its investment volume by 80 percent and grown at an annual rate of 15 to 20 percent without an increase in staff.

It is surprising how many companies have approached CenterPoint about purchasing or licensing CUB for their own internal use. Every time CenterPoint makes a sales pitch to a potential partner, they do a demonstration of CUB—pretty much like the one that convinced CalPers that CenterPoint was ready to make the vision a reality. Often this demonstration becomes the focus of attention, and follow-up calls ensue from other real estate executives. CenterPoint is now considering the possibility of licensing the software or, even further, acting as a service provider to other companies in the industry. None of these were on the radar when CUB was first proposed, but that is what happens when one company has a technology that is so far superior to anything else.

“While many things contributed to our success—the development of our new business plan, and our evolution into a private company—it was CUB that ultimately made our vision a reality,” says Paul Fisher, CenterPoint’s President. “Developing CUB was worth every penny.”

SOURCE: Adapted from “CenterPoint Properties,” *Computerworld Honors Program Case Study*, www.centerpoint-prop.com, accessed May 9, 2011, and “Office Business Application at the Heart of Commercial Real-Estate Company’s Success,” *Microsoft Office System Customer Solution Case Study*.

QUESTIONS TO CONSIDER

1. To build or to buy is one of the central questions when it comes to provisioning technologies. How did CenterPoint choose what to buy and what to develop internally? What lessons can be synthesized from its approach that can be applied to other companies in the future?
2. What is your opinion on whether CenterPoint should possibly license CUB or act as a service provider? Do you think this would dilute CenterPoint’s competitive position? What are the advantages and disadvantages of moving forward with this idea?

- **Strategic Uses of Information Technology.** Information technologies can support many competitive strategies. They can help a business cut costs, differentiate and innovate in its products and services, promote growth, develop alliances, lock in customers and suppliers, create switching costs, raise barriers to entry, and leverage its investment in IT resources. Thus, information technology can help a business gain a competitive advantage in its relationships with customers, suppliers, competitors, new entrants, and producers of substitute products. Refer to Figures 2.3 and 2.5 for summaries of the uses of information technology for strategic advantage.
- **Building a Customer-Focused Business.** A key strategic use of Internet technologies is to build a company that develops its business value by making customer value its strategic focus. Customer-focused companies use Internet, intranet, and extranet e-commerce Web sites and services to keep track of their customers' preferences; to supply products, services, and information anytime or anywhere; and to provide services tailored to the individual needs of the customers.
- **Reengineering Business Processes.** Information technology is a key ingredient in reengineering business operations because it enables radical changes to business processes that dramatically improve their efficiency and effectiveness. Internet technologies can play a major role in supporting innovative changes in the design of work flows, job requirements, and organizational structures in a company.
- **Becoming an Agile Company.** A business can use information technology to help it become an agile company. Then it can prosper in rapidly changing markets with broad product ranges and short model lifetimes in which it must process orders in arbitrary lot sizes; it can also offer its customers customized products while it maintains high volumes of production. An agile company depends heavily on Internet technologies to help it respond to its customers with customized solutions, and to cooperate with its customers, suppliers, and other businesses to bring products to market as rapidly and cost effectively as possible.
- **Creating a Virtual Company.** Forming virtual companies has become an important competitive strategy in today's dynamic global markets. Internet and other information technologies play a key role in providing computing and telecommunications resources to support the communications, coordination, and information flows needed. Managers of a virtual company depend on IT to help them manage a network of people, knowledge, financial, and physical resources provided by many business partners to take advantage of rapidly changing market opportunities.
- **Building a Knowledge-Creating Company.** Lasting competitive advantage today can only come from the innovative use and management of organizational knowledge by knowledge-creating companies and learning organizations. Internet technologies are widely used in knowledge management systems to support the creation and dissemination of business knowledge and its integration into new products, services, and business processes.

These are the key terms and concepts of this chapter. The page number of their first reference appears in parentheses.

- | | | |
|---|--|--|
| 1. Agile company (64) | 8. Knowledge-creating company (67) | 12. Raise barriers to entry (55) |
| 2. Business process reengineering (61) | 9. Knowledge management system (67) | 13. Strategic information systems (49) |
| 3. Competitive forces (49) | 10. Leverage investment in IT (55) | 14. Value chain (59) |
| 4. Competitive strategies (53) | 11. Lock in customers and suppliers (54) | 15. Virtual company (65) |
| 5. Create switching costs (55) | | |
| 6. Customer value (57) | | |
| 7. Interenterprise information systems (65) | | |

review quiz

Match one of the key terms and concepts listed previously with one of the brief examples or definitions that follow. Try to find the best fit for answers that seem to fit more than one term or concept. Defend your choices.

- | | |
|--|---|
| <ul style="list-style-type: none"> _____ 1. A business must deal with customers, suppliers, competitors, new entrants, and substitutes. _____ 2. Cost leadership, differentiation of products, and new product innovation are examples. _____ 3. Using investments in technology to keep firms out of an industry. _____ 4. Making it unattractive for a firm's customers or suppliers to switch to its competitors. _____ 5. Strategies designed to increase the time, money, and effort needed for customers or suppliers to change to a firm's competitors. _____ 6. Information systems that reengineer business processes or promote business innovation are examples. _____ 7. This strategic focus recognizes that quality, rather than price, has become the primary determinant in customers choosing a product or service. _____ 8. Highlights how strategic information systems can be applied to a firm's business processes and can support activities for competitive advantage. | <ul style="list-style-type: none"> _____ 9. A business finding strategic uses for the computing and telecommunications capabilities it has developed to run its operations. _____ 10. Information technology helping a business make radical improvements in business processes. _____ 11. A business can prosper in rapidly changing markets while offering its customers individualized solutions to their needs. _____ 12. A network of business partners formed to take advantage of rapidly changing market opportunities. _____ 13. Learning organizations that focus on creating, disseminating, and managing business knowledge. _____ 14. Information systems that manage the creation and dissemination of organizational knowledge. _____ 15. Using the Internet and extranets to link a company's information systems to those of its customers and suppliers. |
|--|---|

discussion questions

1. Suppose you are a manager being asked to develop computer-based applications to gain a competitive advantage in an important market for your company. What reservations might you have about doing so? Why?
2. How could a business use information technology to increase switching costs and lock in its customers and suppliers? Use business examples to support your answers.
3. How could a business leverage its investment in information technology to build strategic IT capabilities that serve as a barrier to new entrants into its markets?
4. Review the Real World Challenge introduced in the chapter. In such a major transformative project where no one can really envision what the end product (or end company) will look like, how should organizations set out to create these technology-enabled solutions? What kind of approaches would work best? Worst?
5. What strategic role can information play in business process reengineering?
6. How can Internet technologies help a business form strategic alliances with its customers, suppliers, and others?
7. How could a business use Internet technologies to form a virtual company or become an agile competitor?
8. Consider the Real World Solution discussed in the chapter. Do you think CenterPoint Properties' success is the result of the new business model or the new technology deployed to support it (i.e., CUB)? Is it possible to distinguish one from the other? What are the implications for other companies as they seek to reinvent themselves in the future?
9. Information technology can't really give a company a strategic advantage because most competitive advantages don't last more than a few years and soon become strategic necessities that just raise the stakes of the game. Discuss.
10. MIS author and consultant Peter Keen says: "We have learned that it is not technology that creates a competitive edge, but the management process that exploits technology." What does he mean? Do you agree or disagree? Why?

1. End-User Computing

Skills Assessment

Not all programs are written by dedicated programmers. Many knowledge workers write their own software using familiar word processing, spreadsheet, presentation, and database tools. This textbook contains end-user computing exercises representing a real-world programming challenge. This first exercise will allow your course instructor to assess the class. Assess your skills in each of the following areas:

- Word processing:* Approximately how many words per minute can you type? Do you use styles to manage document formatting? Have you ever set up your own mail-merge template and data source? Have you created your own macros to handle repetitive tasks? Have you ever added branching or looping logic in your macro programs?
- Spreadsheets:* Do you know the order of operations your spreadsheet program uses (what does “ $=5*2^2-10$ ” equal)? Do you know how to automatically sort data in a spreadsheet? Do you know how to create graphs and charts from spreadsheet data? Can you build pivot tables from spreadsheet data? Do you know the difference between a relative and a fixed cell reference? Do you know how to use functions in your spreadsheet equations? Do you know how to use the IF function? Have you created your own macros to handle repetitive tasks? Have you ever added branching or looping logic in your macro programs?
- Presentations:* Have you ever used presentation software to create presentation outlines? Have you added your own multimedia content to a presentation? Do you know how to add charts and graphs from spreadsheet software into your presentations so that they automatically update when the spreadsheet data change?
- Database:* Have you ever imported data into a database from a text file? Have you ever written queries to sort or filter data stored in a database table? Have you built reports to format your data for output? Have you built forms to aid in manual data entry? Have you built functions or programs to manipulate data stored in database tables?
- File Management:* Can you store or locate a specific file on a particular storage device? If you receive an attachment on an e-mail, can you store it on your hard drive in a location where you can find it again? Can you create a specific folder for a group of related files, then

navigate to it when necessary, or direct someone else to that location?

- Internet:* Do you know how to navigate your way around the Internet? If someone gives you a specific URL, can you access that location? Do you know what a URL is? Can you modify your home page on your favorite Web browser? Do you know how to use an anti-virus program? Can you use the Status Bar to determine if a link is trying to spoof you to another site? E-mail is arguably the largest use of the Internet today. Can you send and receive e-mail, build a mailing list, and send and receive attachments?

2. Marketing: Competitive Intelligence

Strategic Marketing

Marketing professionals use information systems to gather and analyze information about their competitors. They use this information to assess their product's position relative to the competition and make strategic marketing decisions about their *product*, its *price*, its distribution (*place*), and how to best manage its *promotion*. Michael Bloomberg, founder of Bloomberg (www.bloomberg.com), and others have made their fortunes gathering and selling data about businesses. Marketing professionals find information about a business's industry, location, employees, products, technologies, revenues, and market share useful when planning marketing initiatives.

During your senior year you will find yourself in close competition for jobs. You can take the same intelligence-gathering approach used by professional marketers when planning how to sell your own skills. Use the following questions to help you prepare for your job search.

- Product:* Which business majors are presently in greatest demand by employers? Use entry-level salaries as the primary indicator for demand.
- Product:* Which colleges or universities in your region pose the greatest competitive threat to students with your major?
- Price:* What is the average salary for entry-level employees in your major and geographic region? Is salary your top concern? Why or why not?
- Place:* Which areas of the country are currently experiencing the greatest employment growth?
- Promotion:* What is your marketing plan? Describe how you plan to get your name and qualifications in front of prospective employers. How can the Internet help you get noticed?

3. Competing against Free

Wikipedia Faces Down Encyclopedia Britannica

The record and movie industries are not the only industries to find themselves affected by free access to their products. Encyclopedia Britannica faces challenges by a nonprofit competitor that provides its services without charge or advertising, Wikipedia.org. Wikipedia depends on volunteers to create and edit original content under the condition contributors provide their work without copyright.

Who would work for free? During its creation in the 19th century, the Oxford English Dictionary editors solicited word articles and references from the general public. In the 20th century, AOL.com found thousands of volunteers to monitor its chat rooms. Amazon.com coaxed more than 100,000 readers to post book reviews on its retail Web site. Outdoing them all in the 21st century, Wikipedia published its 1,000,000th English language article in March 2006. Wikipedia includes more than 2,000,000 articles in more than 200 languages, all created and edited by more than 4,800,000 million users.

Can Wikipedia compete on quality? Wikipedia provides its users with both editing and monitoring tools. This allows users to self-police. Wikipedia also uses voluntary administrators who block vandals, temporarily protect articles, and manage arbitration processes when disputes arise. A paper published by *Nature* in December 2005 evaluated 50 Wikipedia articles and found an average of four factual errors per Wikipedia article as compared with an average of three errors per article in the *Encyclopedia Britannica*. More significantly, Wikipedians (as the volunteers call themselves) corrected each error by January 2006. Alexa.com rated Wikipedia.com as the 17th most visited Web site on the Internet, while Britannica.com came in 2,858th place (Yahoo and Google ranked in first and second place).

Wikipedia has already built on its success. In addition to offering foreign language encyclopedias, it also provides a common media archive (commons.wikimedia.org), a multilingual dictionary (www.wiktionary.org), and a news service (www.wikinews.org).

One of the latest Wikipedia projects is Wikiversity, a Web site devoted to free learning, Web education, open educational resources, and collaborative learning communities (www.wikiversity.com).

- How does the Wikimedia Foundation meet the criteria for an agile company?
- How does the Wikimedia Foundation meet the criteria for a virtual company?
- How does the Wikimedia Foundation meet the criteria for a knowledge-creating organization?
- How would you recommend that Encyclopedia Britannica adapt to this new threat?
- How does Wikiversity compare as an educational resource to traditional colleges and schools? How would a degree earned online from wikiversity.com be viewed compared with a degree earned in a traditional learning environment? What learning resources are at Wikiversity that you can use to further your education right now?

4. Knowledge Management

Knowing What You Know

Employees often receive a great deal of unstructured information in the form of e-mails. For example, employees may receive policies, announcements, and daily operational information via e-mail. However, e-mail systems typically make poor enterprise-wide knowledge management systems. New employees don't have access to e-mails predating their start date. Employees typically aren't permitted to search others' e-mail files for needed information. Organizations lose productivity when employees spend time reviewing and organizing their e-mail files. Lastly, the same information might be saved across thousands of different e-mail files, thereby ballooning e-mail file storage space requirements.

Microsoft's Exchange server, IBM's Domino server, and Interwoven's WorkSite, along with a wide variety of open standard Web-based products aim to address an organization's need to share unstructured information. These products provide common repositories for various categories of information. For example, management may use a "Policy" folder in Microsoft Exchange to store all of its policy decisions. Likewise, sales representatives may use a "Competitive Intelligence" database in IBM's Domino server to store information obtained during the sales process about competing products, prices, or marketplace rumors. WorkSite users categorize and store all of their electronic documents in a large, searchable, secured, common repository. Organizations using these systems can secure them, manage them, and make them available to the appropriate personnel. Managers can also appoint a few specific employees requiring little technical experience to manage the content.

However, these systems cannot benefit an organization if its employees fail to contribute their knowledge, if they fail to use the system to retrieve information, or if the system just isn't available

where and when needed. To help managers better understand how employees use these systems, knowledge management systems include usage statistics such as date/time, user name, reads, writes, and even specific document access information.

Research each of these products mentioned above and answer the following questions:

- a. What steps might a manager take to encourage his or her employees to use the organization's knowledge management system?
- b. Should managers set minimum quotas for system usage for each employee? Why or why not?
- c. Aside from setting employee usage quotas, how might an organization benefit from knowledge management system usage statistics?

5. Crowd-Sourcing Ad Reviews

Do You Like This Ad?

Marketers dream of their ads going viral, but what works, what flops, and when is it time to change approaches? Facebook may be on the verge of turning advertising on its head with its automated user feedback system. Read CNNTech's article *How Facebook killed (most) spam* (<http://bit.ly/fE5NMS>), and then answer the questions below:

- a. List each type of user-generated feedback Facebook automatically monitors.
- b. How do the users benefit?
- c. How do advertisers benefit?
- d. How does Facebook benefit?
- e. In your opinion, what obstacles will competitors have to overcome to compete with Facebook's approach to managing advertising?



How to Win Friends and Influence Business People: Quantify IT Risks and Value

CIO Tim Schaefer thinks words do matter.

He looked at the words IT used inside Northwestern Mutual Life, and felt they sent exactly the wrong message about IT's role in meeting business goals. So, over the last 18 months, these words are out: IT costs, internal customers, IT leaders, Alignment, IT systems, and "IT and the business." In are these: IT investments, external customers, business leaders, integration, service levels, IT assets, and "our business."

"We came to realize we ourselves were building the wall. We were distinguishing ourselves from the rest of the company," says Schaefer. "We were somehow different. We had all this special knowledge. So this whole concept of black box, and the gap in the relationship, we came to realize was of our own doing." As part of a broader change of IT strategy and culture, Schaefer has asked the top 150 leaders in IT to commit to being business leaders, not IT leaders.

Symbolic, semantics, and a whole lot of hoo-hah? Sure—if IT continued to behave exactly the same way it always has. At Northwestern Mutual, a life insurance and investment company with more than \$155 billion in assets, IT has not. IT started by working very hard to put a real value on IT assets. Although the process is ongoing, Schaefer says the company now knows it has IT assets worth "somewhere north of \$3 billion." It can talk about service levels in terms business units care about—that causing problems in the underwriting process costs \$11,000 an hour in lost productivity, and problems that keep the field force from using their client management tools costs \$25,000 an hour.

Schaefer's goal is to get IT systems to be viewed as a business asset, with a value every bit as real as the buildings and land the company owns. Getting there requires a portfolio approach to all of its IT assets. That's not a project portfolio approach many IT teams have, but an investment portfolio with the same type of processes the company uses to manage holdings in stocks, bonds, real estate, or private equity. Instead of considering whether to buy, hold, or sell assets, though, the IT asset portfolio assesses IT systems and applications through a framework called TIME: Tolerate, Invest, Migrate, or Eliminate.

Putting a value on an IT asset isn't easy. Northwestern Mutual's IT team does so by working hand-in-hand with

the business units that rely on them. How many more employees would it take to process claims if the software system used for that didn't exist? What's the replacement cost? What's the cost per hour to the business if it goes down? Getting an asset value is only the first step, though. All these factors go into whether and how to invest more into that asset. "If we don't do the right things with these \$3 billion worth of assets, we're not going to optimize the value," Schaefer says.

This asset-and-investment philosophy drives what IT projects the company puts money behind. Lots of companies have a technology strategy committee that helps guide IT spending, and Northwestern Mutual Life does too. "We're transitioning them into an investment management board," Schaefer says. Northwestern Mutual Life has a number of boards to guide its investment into financial asset classes on behalf of policyholders—boards that set broad strategy for where the best opportunities are for return in those categories. Discussions in the technology strategy committee are moving to that same thinking.

From that process, they've targeted specific high-return investment opportunities for technology. For example, technology that reduces barriers of time and space is on that list. Northwestern Mutual's network includes more than 7,000 financial representatives, and those in the Western U.S. states cover massive territory. Yet they're obligated to meet with clients regularly, to make sure they're recommending suitable investments. A video link that lets a Colorado-based representative do live meeting conversations with his three clients in Wyoming in a half-day instead of three days on the road offers a measurable value. There's another word that matters to Schaefer, which fits this financial discussion: partner. Of course, IT wants to be considered a partner with business units on projects, but it has a clear definition for that: IT shares the business risk and benefits, including financial, from IT investments. "We should feel as bad when they aren't meeting their objectives as they do," he says.

Conventional wisdom, decades worth of IT project failures, and less-than-desirable outcomes tell us that every tech-related investment—from a massive SAP ERP rollout to a small CRM deployment—comes with some amount of risk. In fact, according to Forrester Research VP and

principal analyst Chip Gliedman, “of all investments within an organization, investment in IT is generally assumed to have the most risk associated with it. Yet, it is surprising that IT investment has traditionally received the least amount of attention when it comes to risk management.”

Since 2003, when the software and equipment components of the U.S. GDP took their largest fall in 15 years, most CEOs have viewed technology as a cost, not an investment. Although budgets have expanded during the past few years, the growth rates have been modest, and most of the money has gone toward fortifying financial systems, while front-office systems have ranked the lowest. Companies, having neglected the customer far too long in their technology investments, are likely to start feeling the effect as frustrated customers go elsewhere. Customers’ frustration will grow all the more when they deal with clunky corporate systems after years of enjoying tremendous innovation in the consumer technology they use.

The contrast is a direct result of treating technology as a cost. This viewpoint has preserved an older set of technologies that weren’t built for the Internet. Many large enterprises are now realizing that without investment in new systems, no new wave of productivity improvement is possible. How to manage this new wave of investment, and keep costs under control, however, is still baffling to even the best of them.

The process of risk measurement has been “confounding decision makers within IT for some time,” Gliedman asserts. As a result, companies rely on weak qualitative analysis that only loosely ties to enterprise-application project outcomes, he says. Gliedman breaks down IT risk factors into two categories: implementation and impact risks. Implementation-based risks relate to areas such as project size (“the larger the project, the higher the level of uncertainty about the outcome”) and the technology and vendor (will they both deliver on the intended benefits?). Impact-based risks include cultural, training, and managerial factors that can all significantly affect any project’s outcome and benefits.

“While the risk analysis cannot on its own point to the best course of action, it can provide the additional shading

to management so that the eventual decision is an informed one,” Gliedman notes. “Likewise, expectations can be set properly, avoiding overly rosy ROI projections that will lead to inevitable disappointment.”

Most IT departments today could use help in the ongoing struggle to align IT with the business, and vice versa. Business executives are frustrated by application uptime challenges and their significant costs to the company’s bottom line, although IT isn’t fully aware of that. The business side is also not at all excited about long-term enterprise projects. As a consequence of both, business executives are feeling animosity toward IT.

Providing more risk transparency to the Mahogany Row on all IT projects could be a huge win for IT departments right now.

One more thing about the words IT uses. Schaefer and his leadership team made a deliberate choice not to rename the IT department to become the business technology department, even though that’s their mindset. They worried that a name change might sound superficial to the business units. Instead, they focused on how they talk about IT every day. The message alone doesn’t mean a thing if the IT team doesn’t act differently, by valuing IT assets and then optimizing them. But the message does matter, because it very likely reflects how IT thinks about its role in the business and how business units perceive IT. And it’s critical to changing the culture of the organization.

Schaefer has an advantage in getting the company to think and talk about IT as a financial asset. Assets, investments, and returns are the natural language at Northwestern Mutual, as a financial services company. But it is not a stretch for nonfinancial IT organizations to embrace this framework and to put hard values on IT assets.

“Listen to the words you use,” Schaefer advises.

SOURCE: Adapted from Chris Murphy, “Global CIO: What’s IT Worth? Northwestern Mutual Life CIO Knows,” *InformationWeek*, March 8, 2010; Thomas Wailgum, “How to Win CFO Friends and Influence Business People: Quantify IT Investment Risk,” *CIO.com*, April 22, 2009; and Bob Suh, “Gearing Up for Recession: Technology as an Investment, not a Cost,” *Computerworld*, March 14, 2008.

CASE STUDY QUESTIONS

1. By changing the way his group talks about IT investments, CIO Tim Schaefer is trying to change the way the rest of the company sees IT. Why do you think this is necessary? What would be the prevailing mindset about IT in his company, such that he needs to do something about it? Provide some examples of how IT may be regarded in this organization.
2. Chip Gliedman of Forrester Research breaks down IT risks into implementation and impact considerations.

Why do you think these are so difficult to manage? What makes IT investments different from investments in other areas of a company?

3. Do you agree with the notion that IT investments can be treated in the same manner as financial investments, and similarly quantified by putting a dollar value to them? Why or why not? Would your answer change depending on the type of IT investment under consideration?

REAL WORLD ACTIVITIES

1. Do you agree with the approach and metrics employed by Northwestern Mutual to value their IT investments? Can you think of alternative ways, and how those might stack up against those discussed in the case? Break into small groups with your classmates to discuss the pros and cons of alternative approaches to valuing the impacts of IT in a company.
2. Go online and search for examples of IT projects that have been successful, and those that have failed. Make a list of the different factors that seem to influence the outcome of these implementations. Can you group them into the categories discussed in the case? Which seem to be the most important? Prepare a presentation to share your findings.



For Companies Both Big and Small: Running a Business on Smartphones

In early 2006, San-Antonio, Texas-based CPS Energy, the nation's largest municipally owned energy provider, was by all accounts riding the road to riches. The company had the highest bond ratings of any such utility provider. Its workforce and customer base in general expressed satisfaction. And most importantly, it was profitable. In other words, there were no external signs that the company was about to launch a technology program that would redefine the way it did business and reshape its workforce of roughly 4,000.

There weren't external signs, but for those in the know, including Christopher Barron, CPS Energy's vice president and chief information officer, it couldn't have been more clear that a change was imminent—and that the future of the company might depend on it. "We had a much larger workforce than a business our size maybe should have," Barron says.

Barron looked at other companies with large mobile workforces like its own, companies like UPS and FedEx, and saw a huge disparity in the way his business was operating. For instance, specific CPS workers had little or no access to IT systems and resources while away from the office or warehouse. They were often required to visit work sites or customer locations to diagnose issues or suggest fixes before reporting back to the appropriate departments or parties, which would then initiate the next step of the resolution process. That could mean dispatching additional workers, and the whole ordeal could take days.

"If we kept with the amount of manual labor that it took for us to accomplish that work, we would not be in the position to be competitive in the future," Barron says. From this realization, the company's Magellan Program was born.

Barron and his colleagues envisioned the Magellan Program as a way to better mobilize and connect its traditionally siloed workforce to the people and systems they needed to do their jobs. The goals of the program: Extend CPS's networking infrastructure, build its own secure Wi-Fi networks in offices and warehouses, and deploy smartphones and custom mobile applications to all CPS staffers who didn't currently have a laptop or other mobile device. For Barron, the first and most significant challenge in deploying smartphones to such a large user base was getting executive buy-in. "One of our biggest headaches has been, and continues to be, the perception that the technology brings little to the table other than e-mail, and it costs a lot," Barron says.

"For a CIO to try to eliminate all the resistance from a senior executive might take forever," Barron says. "So rather than try to get to the execs and mollify all their fears about cost, usage and safety, we've gone to specific groups, engineers, line workers, office workers, and because it's so cheap we've been able to give the devices out on 'experimental basis.' There's so much value in these handheld devices and two or three applications that they prove themselves," he says. "You just have to get them into the hands of the people that actually need to use them in order to demonstrate that."

Three innovative ways CPS staffers employ their smartphones are as digital cameras at work sites, as GPS tracking mechanisms, and as emergency notification receivers. In the past, CPS might have had to dispatch a small group of "generalist" workers to a service call to make sure the correct person was there. Today, a single worker can visit a site, take a photo of a damaged piece of equipment or infrastructure, and then send it back to headquarters or the office. Then an expert diagnoses the issue and sends along instructions to fix the problem or dispatches the appropriate worker—who's available immediately via voice, e-mail, and SMS text via smartphone.

"The Magellan Program, through the use of smartphones and other technology, has or will empower all employees, no matter what work they perform, to become part of the greater company's 'thought network,'" Barron says. "Each person is now like a node in our network." The company is also seeing significant gains in supply chain efficiency related to Magellan and the smartphone deployment, he says. For instance, smartphones help speed up the purchase order process, because in the past a specific person or group of people needed to be onsite to approve orders. Now the approvers can be practically anywhere with cellular coverage. The company's supply chain buyers can also visit warehouses to work with the people who actually order parts, leading to faster order times, and more proactive supply chain management overall. In just one year, the time it takes to close purchasing and procurement deals decreased by more than 65 percent. Also, inventory levels were reduced by more than \$8 million dollars since the Magellan Program began.

Additionally, both employee and customer satisfaction levels are up, Barron notes, due to the fact that staffers now have more access to corporate systems and information and feel closer to the business. Because CPS can now resolve more customer issues with fewer processes, they've reduced

the time it takes to complete most service calls, leading to happier customers. In fact, the company received the highest score in J.D. Power and Associates 2007 Gas Utility Residential Customer Satisfaction Survey.

The technology, however, is no longer the exclusive purview of large companies with significant IT budgets, at least not anymore. Lloyd's Construction in Eagan, Minnesota, might not seem as though it needs flashy phone software. The \$9-million-a-year demolition and carting company has been run by the same family for the past 24 years. Lloyd's takes down commercial and residential buildings, then hauls them away. What could be more simple?

That is, if wrangling 100 employees, 30 trucks, and more than 400 dumpsters can be called simple. Coordinating those moving parts is crucial to growing the business—and to saving the sanity of Stephanie Lloyd, 41, who has run the company for the past four years. Until recently, Lloyd's used a hodgepodge of spreadsheets, paper ledgers, and accounting software on company PCs to keep track of its workers and equipment. To make matters worse, the company used radios to coordinate with its workers on the job, and the more cell phone towers that came online in Minnesota, the worse Lloyd's radio reception got. It was time, the Lloyds decided, to drag their company into the 21st-century world of smartphones.

Lloyd's considered a half-dozen mobile-productivity software suites before settling on eTrace, which happened to come from a company called GearWorks based just across town. Not only was GearWorks local, but its software worked on Sprint Nextel's i560 and i850 phones, which are aimed at the construction industry. Lloyd's had already started buying these push-to-talk phones to wean workers from their dying radios. Immediately, there were troubles with technophobic staff. Employees had to be guided up a steep learning curve in order to master even basic features on their new phones. For 18 months the two systems ran side by side: eTrace as it was phased in, and the old paper-and-pencil system as it was phased out. Accounting inconsistencies quickly crept in.

And eTrace gave rise to a delicate labor problem. The software featured integrated mapping and travel data that showed the real-time locations of all company assets. To their chagrin, the Lloyds discovered that those assets were spending too much time parked outside the same lunch spots—ones that were not on prescribed routes. Lloyd was sympathetic to workers' needs for breaks—"we've all worked demolition here," she says—but quickly clamped down on unauthorized ones.

GearWorks' CEO says the challenges Lloyd's faced are to be expected. "All these products operate under the ominous pendulum of challenge and opportunity," says Todd Krautkremer, 47. "But our software does a good job of letting the customer control that rate of change in the business."

Once the deployment dust had settled, the savings became clear. The company employs 12 drivers, 22 foremen, and seven office workers who use 41 phones running eTrace. The company buys an unlimited data package for each phone, which totals about \$4,000 a month. Add other networking charges, and Lloyd's spends about \$50,000 a year for a complete business, accounting, and communications solution. Before eTrace, the company paid an accountant 40 hours a week to do the books. Now that person comes in one day a week for six hours, saving roughly \$1,000 a week.

Data entry and job logging by the dispatcher and foremen, Lloyd says, is roughly 1½ times faster than paper and radio. More efficient routing has cut fuel costs by about 30 percent. And employees have stopped making unauthorized stops. Lloyd estimates a net improvement in performance of 10 percent to 12 percent, or roughly \$1 million for 2007—not a bad return on \$50,000.

"It really does work," she says.

SOURCE: Adapted from Jonathan Blum, "Running an Entire Business from Smartphones," *FORTUNE Small Business*, March 12, 2008; and Al Sacco, "How Smartphones Help CPS Energy Innovate and Boost the Bottom Line," *CIO Magazine*, July 11, 2008.

CASE STUDY QUESTIONS

1. In which ways do smartphones help these companies be more profitable? To what extent are improvements in performance coming from revenue increases or cost reductions? Provide several examples from the case.
2. The companies described in the case encountered a fair amount of resistance from employees when introducing smartphone technologies. Why do you think this happened? What could companies do to improve

the reception of these initiatives? Develop two alternative propositions.

3. CPS Energy and Lloyd's Construction used smartphones to make existing processes more efficient. How could they have used the technology to create new products and services for their customers? Include at least one recommendation for each organization.

REAL WORLD ACTIVITIES

1. In addition to the companies featured in the case, others like FedEx and UPS, which have large mobile workforces, heavily use mobile communication technologies. What other companies could benefit from these innovations? Go online and research uses of smartphones in industries different from the

ones reviewed here. Prepare a report to share your findings.

2. Use the Internet to research the latest technological developments in smartphones, and imagine how those could be used by companies to deliver value to customers and shareholders.