

Achieving Competitive Advantage with Information Systems

CHAPTER 3

STUDENT LEARNING OBJECTIVES

After completing this chapter, you will be able to answer the following questions:

1. How does Porter's competitive forces model help companies develop competitive strategies using information systems?
2. How do the value chain and value web models help businesses identify opportunities for strategic information system applications?
3. How do information systems help businesses use synergies, core competencies, and network-based strategies to achieve competitive advantage?
4. How do competing on a global scale and promoting quality enhance competitive advantage?
5. What is the role of business process reengineering (BPR) in enhancing competitiveness?

CHAPTER OUTLINE

Chapter-Opening Case: *Apple's iTunes: Music's New Gatekeeper*

- 3.1 Using Information Systems to Achieve Competitive Advantage
- 3.2 Competing on a Global Scale
- 3.3 Competing on Quality and Design
- 3.4 Competing on Business Processes
- 3.5 Hands-On MIS

Business Problem-Solving Case: *YouTube, the Internet, and the Future of Movies*

APPLE'S ITUNES: MUSIC'S NEW GATEKEEPER

Where do you buy most of the music you listen to? Up until 2003, you would have purchased CDs from a retail store, such as Tower Records or Wal-Mart, and you would have listened to the music on a boom box or portable CD player. Today, you're probably downloading the music from the Internet and playing it on a portable music player. That portable music player is most likely to be an Apple iPod storing songs from Apple's online iTunes Store.

The iPod was launched in 2001 and the iTunes Store in 2003 as the company changed its business strategy to include digital entertainment and consumer devices as well as computers. iTunes was an instant hit, selling 1.4 million songs in its first week. iTunes and iPod became a major revenue stream for the company.

Apple's online music delivery system helped revolutionize the way music is sold and played. CD sales have been declining for the past seven years, but digital music sales are climbing. Over 100 million iPods have been sold worldwide, and iTunes is now one of the largest sellers of music in the United States. It sold 1.2 billion songs in 2006 alone.



Apple nearly monopolizes digital music sales, which are climbing as CD sales continue to fall and is the third-largest music retailer in the United States.

Apple's iTunes and iPod have also emerged as key forces in how hit tunes and hit albums are created. In the past, radio deejays wielded the power to make or break hit songs and hit albums by selecting what played on the air. More recently, it has been MTV. Now iTunes and Apple have supplanted these music gatekeepers.

The iTunes Store home page displays several dozen albums, TV shows, and movie downloads for sale from among the 6 million such goods the Apple site offers. The promotional impact of appearing on the iTunes Store home page viewed by roughly 1 million people each day is equivalent to a CD being displayed at the checkout stands of all 940 Best Buy stores or featured on the front page of Wal-Mart's ad circular.

In other words, the artists and music groups who are chosen to populate the iTunes Store home page get a tremendous boost. Placement on the iTunes Store home page has put an unknown band on the map, generating millions of dollars in sales. Other groups who are not displayed so prominently may remain forever in obscurity.

In exchange for placement on the iTunes Store home page, a music group may be required to give iTunes exclusive access to new songs, special discount pricing, or interviews with band members. Most other retailers seek exclusive offerings, but Apple wields enormous clout, especially with slightly out-of-mainstream music. Although some artists have complained that iTunes "bullies" them into supplying exclusive content, most recording labels are eager to cooperate because of iTunes's ability to drive sales. Dozens of iTunes editors and label-relations staff collaborate each week to determine what selections will populate the iTunes Store home page when it is refreshed every Tuesday.

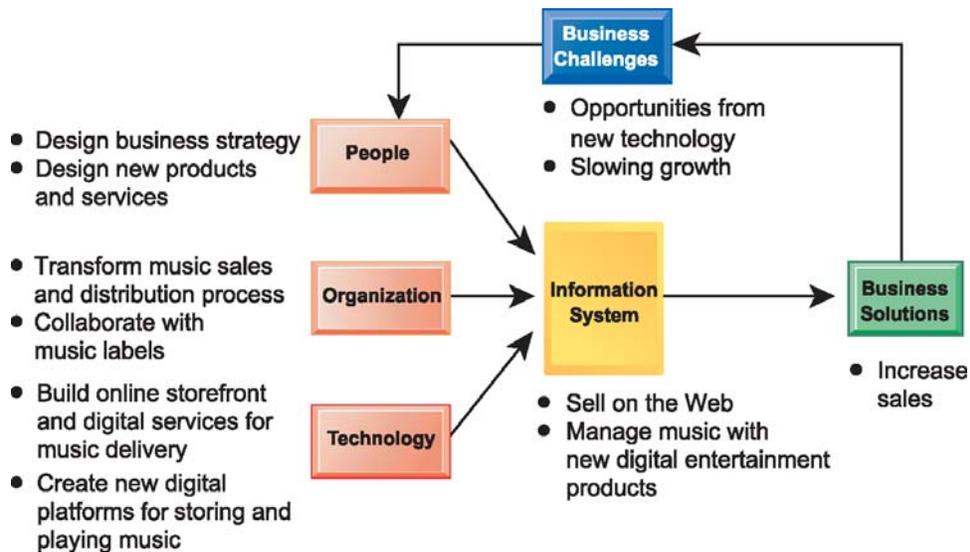
During the week when an album is featured on the iTunes Store home page, it often sells about five times more copies on average at that Web site than it does in the following three to five weeks when the album is no longer featured. For example, when Warner Music Group's Rhino Entertainment was trying to promote a few older Prince titles, it negotiated with Apple to give four albums, including "Purple Rain," prominent placements in the iTunes Store. These albums were priced at \$7.99 each, two dollars less than Apple's standard album price. As a result of the prime display, digital sales of "Purple Rain" rose fivefold and sales of "The Very Best of Prince" more than doubled.

Sources: Nick Wingfield and Ethan Smith, "Music's New Gatekeeper," *The Wall Street Journal*, March 9, 2007 and Greg Sandoval, "Apple's iTunes Overtakes Amazon in Overall Music Sales," CNET News.com, June 22, 2007.

The story of Apple and iTunes illustrates some of the ways that information systems help businesses compete—and also the challenges of sustaining a competitive advantage. Apple was noted for innovative, user-friendly computers and software, but it was always overshadowed by PCs running Microsoft Windows and software products. As long as Apple was an underdog in the PC industry, it could not keep growing. Founder and CEO Steve Jobs recognized that the Internet was a new channel for selling music and entertainment and started developing products and services to tap the emerging digital entertainment market.

The chapter-opening diagram calls attention to important points raised by this case and this chapter. Apple's management saw there was an opportunity to use information technology to expand its product line and sources of revenue. It developed series of new products (the iPod, iPod nano, and iPod video) and software for online music delivery (iTunes) to tap into the growing trend for downloading music from the Internet rather than buying CDs in a physical store. Apple's digital music and video products and services helped the company change its strategic direction so that it derives more of its revenue from digital entertainment. The iPod and iTunes are information system-based products that provide a strategic advantage.

These products have had a much wider impact than just changing Apple's business model—they have helped transform the entire music industry. Nearly 20 percent of all music sold in the United States is downloaded from the Internet, with digital music sales growing at



a rate of 50 percent each year. Apple's iTunes Store has become a major force in determining hit songs, albums, and artists. This has created some problems and tension for the traditional music recording industry, but it has also opened up new promotional opportunities, especially for lesser-known independent labels.

HEADS UP

In the past decade, firms using the Internet and the Web, and other kinds of information systems, have created entirely new products and services, and entire new industries and businesses. Other firms have achieved operational excellence and much closer relationships with customers and suppliers. In so doing, these firms often have achieved competitive advantages over others. Every business student and future manager should know about the strategic uses of information technology.

3.1 Using Information Systems to Achieve Competitive Advantage

In almost every industry you examine, you will find that some firms do better than most others. There's almost always a stand-out firm. In the automotive industry, Toyota is considered a superior performer. In pure online retail, Amazon is the leader; in off-line retail, Wal-Mart, the largest retailer on earth, is the leader. In online music, Apple's iTunes is considered the leader with more than 75 percent of the downloaded music market, and in the related industry of digital music players, the iPod is the leader. In Web search, Google is considered the leader.

Firms that "do better" than others are said to have a competitive advantage over others: They either have access to special resources that others do not, or they are able to use commonly available resources more efficiently—usually because of superior knowledge

and information assets. In any event, they do better in terms of revenue growth, profitability, or productivity growth (efficiency), all of which ultimately in the long run translate into higher stock market valuations than their competitors.

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

PORTER'S COMPETITIVE FORCES MODEL

Arguably, the most widely used model for understanding competitive advantage is Michael Porter's **competitive forces model** (see Figure 3-1). This model provides a general view of the firm, its competitors, and the firm's environment. Recall in Chapter 2 we described the importance of a firm's environment and the dependence of firms on environments. Porter's model is all about the firm's general business environment. In this model, five competitive forces shape the fate of the firm.

Traditional Competitors

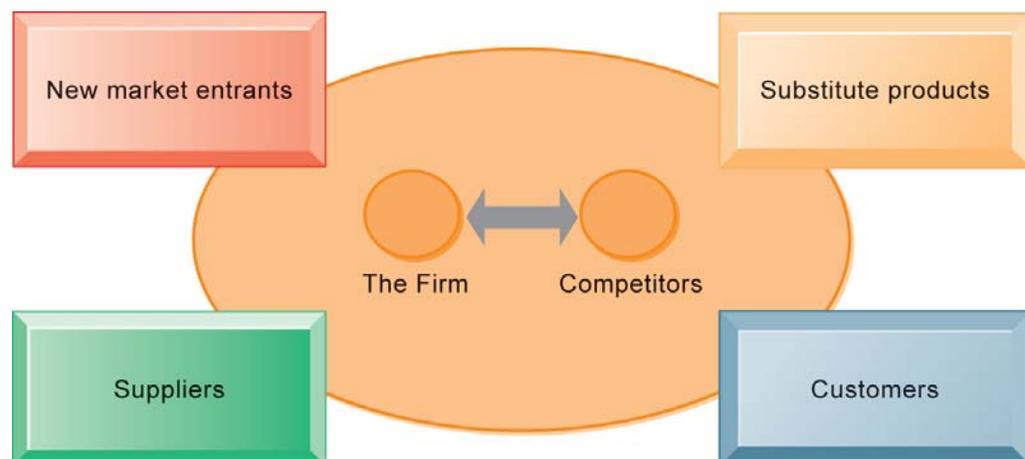
All firms share market space with other competitors who are continuously devising new, more efficient ways to produce by introducing new products and services, and attempting to attract customers by developing their brands and imposing switching costs on their customers.

New Market Entrants

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

Figure 3-1
Porter's Competitive Forces Model

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



weakness: They depend on outside financing for new plants and equipment, which can be expensive; they have a less-experienced workforce; and they have little brand recognition.

Substitute Products and Services

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

Customers

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

Suppliers

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

INFORMATION SYSTEM STRATEGIES FOR DEALING WITH COMPETITIVE FORCES

So what is a firm to do when it is faced with all these competitive forces? And how can the firm use information systems to counteract some of these forces? How do you prevent substitutes and inhibit new market entrants? How do you become the most successful firm in an industry in terms of profit and share price (two measures of success)?

Basic Strategy 101: Align the IT with the Business Objectives

The basic principle of IT strategy for a business is to ensure the technology serves the business, and not the other way around. The research on IT and business performance has found that (a) the more successfully a firm can align its IT with its business goals, the more profitable it will be, and (b) only about one-quarter of firms achieve alignment of IT with business. About half of a business firm's profits can be explained by alignment of IT with business (Luftman, 2003; Henderson, et al., 1996).

Most businesses get it wrong: IT takes on a life of its own and does not serve management and shareholder interests very well. Instead of business people taking an active role in shaping IT to the enterprise, they ignore it, claim to not understand IT, and tolerate failure in the IT area as just a nuisance to work around. Such firms pay a hefty price in poor performance. Successful firms and managers understand what IT can do and how it works, take an active role in shaping its use, and measure its impact on revenues and profits.

So how do you as a manager achieve this alignment of IT with business? In the following sections, we discuss some basic ways to do this, but here's a summary:

- Identify your business strategy and goals.
- Break these strategic goals down into concrete activities and processes.
- Identify how you will measure progress towards the business goals (e.g. metrics).
- Ask yourself "How can information technology help me achieve progress towards our business goals and how it will improve our business processes and activities?"
- Measure actual performance. Let the numbers speak.

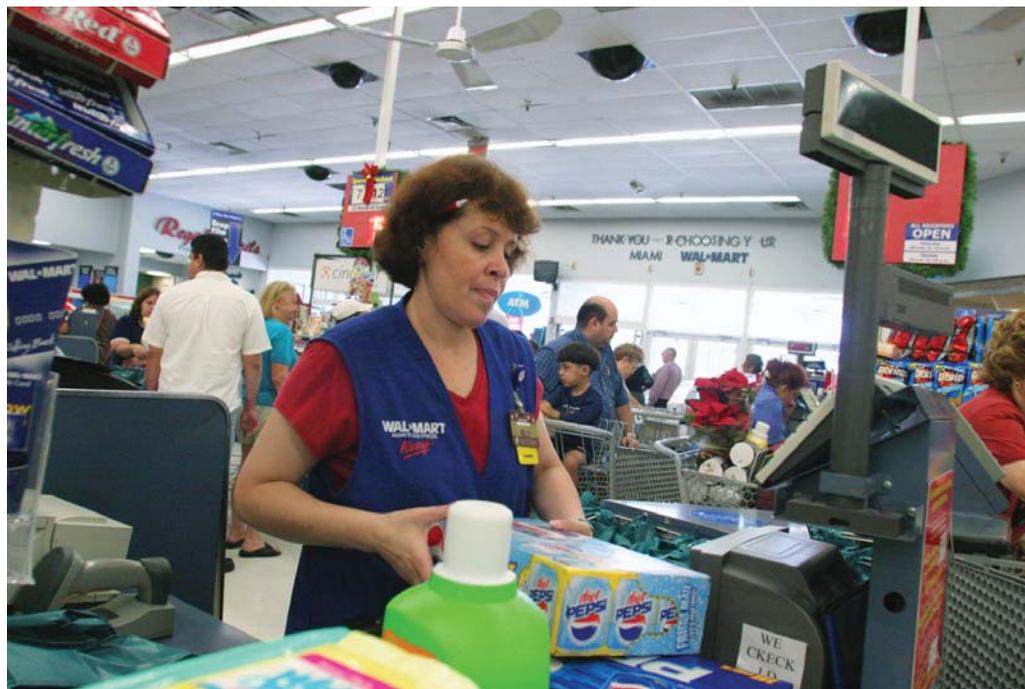
Let's see how this works out in practice. There are four generic strategies, each of which often is enabled by using information technology and systems: low-cost leadership, product differentiation, focus on market niche, and strengthening customer and supplier intimacy.

Low-Cost Leadership

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

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

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



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

Product Differentiation

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

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

Lands' End customers can use its Web site to order jeans, dress pants, chino pants, and shirts custom-tailored to their own specifications. Customers enter their measurements into a form on the Web site, which then transmits each customer's specifications over a network to a computer that develops an electronic made-to-measure pattern for that customer. The individual patterns are used to drive fabric-cutting equipment at a manufacturing plant. Lands' End has almost no extra production costs because the process does not require

The screenshot displays the Dell 'Build Your System' interface for an Inspiron 1520 laptop. The page is titled 'The Dell Online Store: Build Your System - Mozilla Firefox'. The main navigation bar includes 'Products', 'Services', 'Support', and 'Purchase Help'. A search bar and 'Sign In' link are also present. The interface is divided into several sections:

- Build My Dell Progress:** 1. Build My Dell (selected), 2. Add My Software & Accessories, 3. Protect My Investment, 4. Review & Continue.
- SELECT MY SYSTEM COLOR:** A list of color options with radio buttons: Jet Black (subtract \$46), Alpine White (add \$0), Espresso Brown (add \$0), Ruby Red (Included in Price), Midnight Blue (add \$0), Spring Green (add \$0), Flamingo Pink (add \$0), and Sunshine Yellow (add \$0). Each color option includes a note about potential shipping date delays.
- System Components:** A row of icons representing different hardware components: System Color, Processor, Operating System, Display, Video Card, Memory, Hard Drive, and Optical Drive.
- Inspiron 1520 Details:**
 - Price: From \$1,206, currently \$1,215 (As low as \$37/month²).
 - Discount Details and Preliminary Ship Date: 9/6/2007.
 - My Components:**
 - Intel Core™ 2 Duo T5050 (1.50Hz/67MHz FSBCMB cache)
 - Genuine Windows Vista® Home Basic Edition
 - Glossy, widescreen 15.4 inch display (1280x800)
 - Intel Graphics Media Accelerator X3100
 - 1GB Shared Dual Channel DDR2 at 667MHz
 - 60GB SATA Hard Drive (5400RPM)
 - CD writer / DVD player (Combo Drive)
 - Dell Wireless 1390 802.11g Mini-Card
 - No Webcam Option
 - 50Whr Lithium Ion Battery (6 cell)
 - High Definition Audio 2.0

A footer note states: '*Configuration, pricing, and monthly payment information above is estimated and presented for your convenience only. All pricing, shipping & handling and monthly payment information is subject to change without notice. Final order specifications and amounts, including tax and shipping & handling, will be communicated following receipt of your order.'

On the Dell Inc. Web site, customers can select the options they want and order their computer custom built to these specifications. Dell's assemble-to-order system is a major source of competitive advantage.

additional warehousing, production overruns, and inventories, and the cost to the customer is only slightly higher than that of a mass-produced garment. This ability to offer individually tailored products or services using the same production resources as mass production is called **mass customization**.

Table 3.1 lists a number of companies that have developed IS-based products and services that other firms have found difficult to copy.

Focus on Market Niche

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

The data come from a range of sources—credit card transactions, demographic data, purchase data from checkout counter scanners at supermarkets and retail stores, and data collected when people access and interact with Web sites. Sophisticated software tools find patterns in these large pools of data and infer rules from them that can be used to guide decision making. Analysis of such data drives one-to-one marketing where personal messages can be created based on individualized preferences. For example, Hilton Hotels' OnQ system analyzes detailed data collected on active guests in all of its properties to determine the preferences of each guest and each guest's profitability. Hilton uses this information to give its most profitable customers additional privileges, such as late check-outs. Contemporary customer relationship management (CRM) systems feature analytical capabilities for this type of intensive data analysis (see Chapters 2 and 8).

The Interactive Session on Organizations describes how AutoNation is mining customer data to determine which models and options they are most likely to buy and then using that information to make better decisions about stocking inventory. But it is having trouble getting car manufacturers to use their findings from the data to drive production. As you read this case, try to identify the problem this company is facing; what alternative solutions are available to management; and the people, organization, and technology issues that have to be addressed when developing the solution.

Strengthen Customer and Supplier Intimacy

Use information systems to tighten linkages with suppliers and develop intimacy with customers. Chrysler Corporation uses information systems to facilitate direct access from suppliers to production schedules, and even permits suppliers to decide how and when to ship suppliers to Chrysler factories. This allows suppliers more lead time in producing goods. On the customer side, Amazon keeps track of user preferences for book and CD purchases, and can recommend titles purchased by others to its customers. Strong linkages to customers and suppliers increase switching costs, and loyalty to your firm.

TABLE 3.1

IS-Enabled New Products and Services Providing Competitive Advantage

Amazon: One-click shopping	Amazon holds a patent on one-click shopping that it licenses to other online retailers
Online music: Apple iPod and iTunes	An integrated handheld player backed up with an online library of 6 million songs
Golf club customization: Ping	Customers can select from more than 1 million different golf club options; a build-to-order system ships their customized clubs within 48 hours
Online person-to-person payment: PayPal.com	Enables transfer of money between individual bank accounts and between bank accounts and credit card accounts

INTERACTIVE SESSION: ORGANIZATIONS**Can Detroit Make the Cars Customers Want?**

Burger King lets you “have it your way.” Your local car dealer is usually not quite so customer friendly. A typical ready-to-buy car shopper may walk into the dealership with an idea of how much he or she wants to spend and which features the car should include for that price.

Many dealers will order a customized vehicle for a customer, but such an order usually adds six to eight weeks to the transaction. The customer who wants to buy on the spot must choose from cars on the lot that the manufacturer has already configured, priced, and shipped. Despite manufacturer incentives and rebates to entice customers to purchase, dealers often have a glut of new cars sitting in their lots for months at a time that no one wants to buy. The swollen inventory and slow turnaround hurt dealers because they must borrow money to pay for the cars the manufacturers ship.

AutoNation, the largest chain of car dealers in the United States, is no exception. With over \$19 billion in annual revenue, AutoNation is the leading seller of automobiles in the country. The company has 257 dealerships in 16 states and sells four percent of all new cars sold in the United States. But it, too, has excessive inventory that it can't easily sell.

Why don't auto manufacturers try harder to produce the car models and options customers actually want? One reason is that their manufacturing processes are not set up to do so and have been geared toward optimizing the efficiency of the production plant. It has become imperative for the manufacturers to keep their plants running regardless of demand to pay for the rising costs of employee healthcare and pensions. Furthermore, auto workers must be paid most of their salaries regardless of whether they are working, so the manufacturers want them working all the time. Pushing out factory-friendly vehicles keeps revenue streams flowing because the automakers are paid as soon as the cars ship to the dealers.

These days, with so many options available for cars, this manufacturing strategy makes less sense. For example, a dealer in Florida may get stuck with four-wheel drive SUVs that, while in demand in climates that see regular snowfall, have little appeal to drivers in the Sunshine State. Similarly, a mid-priced car that is so loaded with options that it reaches luxury prices will be passed over in favor of the better car.

Historically, dealers have been independent or small chains selling a single brand of car and having little bargaining power. They had to accept whatever the auto manufacturers shipped them even if it was bad for business. With the growth of chains like

AutoNation, the dealers have gained more power in the relationship.

AutoNation's CEO Michael J. Jackson is pressuring the Big Three to cut back on production and focus on building cars that customers actually want. Jackson's intent is not simply to tell automakers what to do. He wants to show them the way. AutoNation already has experience working with data on the habits of car buyers and the most popular configurations of all makes of vehicles. The work started when the company put forth a major effort to consolidate the customer lists from its hundreds of dealerships.

AutoNation used proprietary analytic software as well as assistance from DME, a marketing firm with expertise in creating customized direct mail campaigns. AutoNation no longer sends out the same mailing to every customer who has opted to be on the mailing list. The chain has divided customers into 62 groups that receive mailings that have been customized for each group with relevant sales pitches and service specials. Service revenues in particular have received a boost from this sort of targeted marketing. AutoNation's goal for its data is to offer products and services that its customers want rather than sifting through its data to find customers that might want the products it already has.

AutoNation is now applying these principles of market intelligence to auto manufacturing. By mining consumer data, Jackson wants to pinpoint the few configurations of each vehicle among thousands of possible variations that are most popular with buyers. That way, the manufacturers can focus on building these vehicles in the numbers that the data dictate.

Ford, GM, and Chrysler have all expressed their support for Jackson's attempts to integrate customer data with auto manufacturing processes. Mark LaNeve, head of North American sales and marketing for GM, suggested that his company might collaborate with Jackson on the creation of a predictive modeling system to bring production in line with consumer demand. At the same time, LaNeve is not overly concerned about inventory levels and does not think that the industry is in crisis. Jackson may still have a lot of campaigning to do before market intelligence and auto manufacturing truly co-exist.

Sources: Neal E. Boudette, “Big Dealer to Detroit: Fix How You Make Cars,” *The Wall Street Journal*, February 9, 2007; Rob Preston, “Down to Business: Engage with Customers, Don't Just Humor Them,” *InformationWeek*, February 24, 2007; John Gaffney, “AutoNation Solves Customer Information Gridlock,” CRM News, October 21, 2004; Sharon Silke Carty, “Chrysler Wrestles with High Levels of Inventory as Unsold Vehicles Sit on Lots,” *USA Today*, November 2, 2006; “Chrysler's Inventory Casts Long Shadow on Detroit,” Reuters, November 5, 2006.

CASE STUDY QUESTIONS

1. Why is AutoNation having a problem with its inventory? Why is this also a problem for auto manufacturers such as GM, Ford, and Chrysler? How is this problem impacting the business performance of AutoNation and of the auto manufacturers?
2. What pieces of data does AutoNation need to determine which cars to stock in each of its dealerships? How can it obtain these data?
3. What is AutoNation's solution to its problem? What obstacles must AutoNation overcome to implement its solution? How effective will the solution be?

MIS IN ACTION

Explore AutoNation.com, examining all of its features and capabilities. Then answer the following questions.

1. How does this Web site help AutoNation forge closer ties with customers and potential customers?
2. What information could AutoNation collect from its Web site that would help it determine which makes and models of cars are of most interest to potential buyers?

Table 3.2 summarizes the competitive strategies we have just described. Some companies focus on one of these strategies, but you will often see companies pursuing several of them simultaneously. For example, Dell Inc. has tried to emphasize low cost as well as the ability to customize its personal computers. Parker Hannifin, described in the Interactive Session on People, competes by offering products with unique features, but it also must compete on the basis of cost for products that can be obtained from many other sources. Parker Hannifin's management uses information systems to help it implement this strategy, but it initially had trouble working this strategy out. As you read this case, try to identify the problem this company is facing; what alternative solutions are available to management; and the people, organization, and technology issues that have to be addressed when developing the solution.

Implementing any of these strategies is no simple matter. But it is possible, as evidenced by the many firms that obviously dominate their markets and that have used information systems to enable their strategies. As shown by the Parker Hannifin case and other cases

TABLE 3.2

Four Basic Competitive Strategies

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

INTERACTIVE SESSION: PEOPLE**Parker Hannifin Finds the Right Price**

Parker Hannifin Corporation, headquartered in Cleveland, Ohio, is a \$9.4 billion business that manufactures and sells industrial parts for motion control systems such as fluid power systems and electromechanical controls. Parker Hannifin also produces components and systems for fluid purification, fuel control, air conditioning, refrigeration, and thermal management.

Overall, Parker Hannifin's 57,000 employees manufacture 800,000 parts in 292 plants covering 35 states in the United States and 46 foreign countries. The company has 417,000 customers in nearly every manufacturing, processing, and transportation industry. Parker Hannifin produces tens of thousands of different products, which are often custom-engineered.

When Donald Washkewicz took over as CEO in 2000, he found Parker Hannifin in a profit margin slump. As Washkewicz saw it, the company was holding itself back by using a pricing strategy that severely limited profit margin growth. Management determined the prices of all products by adding a flat percentage to the cost of production and delivery. Generally, the markup for any product was 35 percent. This scheme was popular among managers because of its simplicity.

Under this pricing model, it did not matter how good a product was in comparison to previous versions of the same product or to similar products offered by competitors. Even if the market allowed for an increase in profit margin, Parker Hannifin was not taking advantage of the opportunity. Additionally, if the company refined a production process to manufacture a product for less money, the selling price of the product dropped with the cost.

Washkewicz decided that his company required a strategic pricing system where prices are determined by what the market will bear based on demand or the value as perceived by the customer. Parker Hannifin was selling itself short by not exploring how much customers were willing to pay for specific products. Some industries charge premium prices based on factors such as the calendar or special circumstances. For example, airline tickets to Europe cost more in the summer than they do in the winter because they are in greater demand.

Washkewicz had to approach a change in pricing strategy carefully. With greater competition from a global economy and many customers in heavy cost-cutting modes, manufacturers had to think twice about raising prices. For Parker Hannifin, the pricing issue was complicated by the fact that approximately half of its products were custom-designed for a single customer.

To help tackle the transition to a strategic pricing plan, Washkewicz enlisted consultants and created the position of vice president of corporate strategic pricing. Together, they had to convince the company's managers that making such a significant change at a company known for its conservative culture was the right move. Washkewicz backed up his position with the observations he made on a tour of Parker Hannifin's facilities around the world in 2000. He saw positive signs in many aspects of the business: rising productivity, new accounts, and advantageous acquisitions. Yet, the company consistently came up short in its return on invested capital, as measured against similar manufacturers.

The company's pricing methods were based on an old system adopted in the 1990s that used "a cookbook approach" for calculating prices. Managers input the costs of producing each item into a computer, which then generated a suggested base price. That approach ignored instances in which Parker Hannifin had a unique or superior product for which the company could demand a higher price. But to identify these opportunities, the company needed much more sophisticated software that could analyze many other factors besides costs, with numerous combinations of products, customers, and terms of sale.

The consultants Washkewicz hired conducted a survey of Parker Hannifin's entire catalog of products and assigned each product to a category labeled A, B, C, or D. The A category represented products that the company produced in high volume and that were subject to outside competition. Due to these factors, such products were poor candidates for flexible pricing. Moving down the line of categories toward D, the products became increasingly specialized due to their rarity, their lack of competition, their niche, their quality, or the speed with which Parker Hannifin delivered them. It was with these products that the company could achieve higher returns.

The survey showed that approximately one-third of Parker Hannifin's products were priced too low. The company raised these prices by an average of 5 percent, with some going up by as much as 60 percent. In some cases, the data dictated that products receive reduced prices. Of course, distributors and customers quickly expressed their displeasure with the elevated prices. Parker Hannifin educated the distributors about the advantages of its products, enabling the distributors to convince customers that the products were worth the new prices. Eventually, most customers understood the logic behind the pricing strategy and found Parker Hannifin still to be their best source for purchasing.

The company installed new software from Vanguard's Graphical Performance Series (GPS). The software combines data from multiple sources and uses the rules established by Parker Hannifin's new pricing methodology, taking into account factors such as pricing averages, product volume, and customer type. Initially the company's strategic pricing process used report writer and spreadsheet software but had to be completed manually. Using GPS, the entire process is automated, and the information is distributed automatically to users at all levels of the organization. Parker Hannifin's product management group uses this information in its product development process to determine which products will be the most profitable.

Washkewicz assigned a pricing guru to implement strategic pricing in every one of the company's 115

divisions. Since then, Parker Hannifin's return on investment has increased steadily, up to 21 percent in 2006 from 7 percent in 2002. In that same period, the company's net income jumped from \$130 million to \$673 million. Pricing guru Sheila Konopka summarized Washkewicz's willingness to ask the difficult question and change a culture thusly: "If we could make 35% margin for a big order—that was great. Nobody asked: 'Why not 45%?'"

Sources: Timothy Aepfel, "Seeking Perfect Prices, CEO Tears Up the Rules," *The Wall Street Journal*, March 27, 2007; "Parker-Hannifin Corporation Form 10-K," For the fiscal year ended June 30, 2006, accessed via www.parker.com, April 16, 2007; Carl Howe, "Parker-Hannifin Does Pricing the Right Way," SeekingAlpha.com, March 29, 2007; Joseph Ogando, "Parker's Innovation Strategy," www.designnews.com, March 26, 2007; and Joseph Ogando, "Parker Develops Smarter Seal," www.designnews.com, March 26, 2007.

CASE STUDY QUESTIONS

1. What is strategic pricing? How does it work? What data are required?
2. What role do information systems play in strategic pricing? What role do people play in getting a strategic pricing system to work?
3. What kind of impact does strategic pricing have on a business such as Parker Hannifin?
4. What other kinds of businesses could benefit from strategic pricing?
5. How are value chain and competitive forces analysis related to Parker Hannifin's strategic pricing?

MIS IN ACTION

Briefly explore Parker Hannifin's Web site. Click on the Markets section and select one of its markets to examine in greater detail. Click on Products for the market you have selected and answer the following questions:

1. What products does Parker Hannifin produce for the market you selected?
2. Which of these products are likely to be Category A products? Which are likely to be Category D products? To answer this question, review the product description and also search the Web to see if you can find competing products.

throughout this book, successfully using information systems to achieve a competitive advantage requires a precise coordination of technology, organizations, and people. Indeed, as many have noted with regard to Wal-Mart, Dell, and Amazon, the ability to successfully implement information systems is not equally distributed, and some firms are much better at it than others. It is not simply a matter of purchasing computers and plugging them into the wall socket. We discuss these topics throughout the book.

THE INTERNET'S IMPACT ON COMPETITIVE ADVANTAGE

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

For instance, the printed encyclopedia industry and the travel agency industry have been nearly decimated by the availability of substitutes over the Internet. Likewise, the Internet

has had a significant impact on the retail, music, book, brokerage, and newspaper industries. At the same time, the Internet has enabled new products and services, new business models, and new industries to spring up every day from eBay and Amazon, to iTunes and Google. In this sense, the Internet is “transforming” entire industries, forcing firms to change how they do business.

Because of the Internet, the traditional competitive forces are still at work, but competitive rivalry has become much more intense (Porter, 2001). Internet technology is based on universal standards that any company can use, making it easy for rivals to compete on price alone and for new competitors to enter the market. Because information is available to everyone, the Internet raises the bargaining power of customers, who can quickly find the lowest-cost provider on the Web. Profits have been dampened. Some industries, such as the travel industry and the financial services industry, have been more impacted than others. Table 3.3 summarizes some of the potentially negative impacts of the Internet on business firms identified by Porter.

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

THE BUSINESS VALUE CHAIN MODEL

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

The **value chain model** highlights specific activities in the business where competitive strategies can best be applied (Porter, 1985) and where information systems are most likely to have a strategic impact. This model identifies specific, critical leverage points where a

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

TABLE 3.3

Impact of the Internet on Competitive Forces and Industry Structure

firm can use information technology most effectively to enhance its competitive position. The value chain model views the firm as a series or chain of basic activities that add a margin of value to a firm’s products or services. These activities can be categorized as either primary activities or support activities (see Figure 3-2).

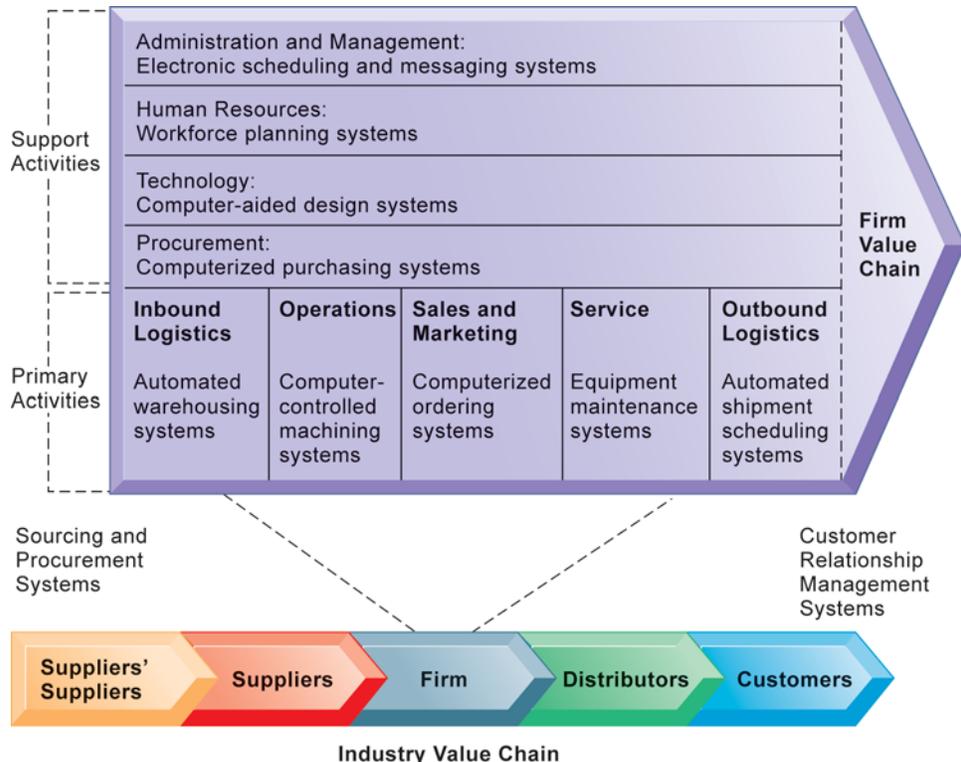
Primary activities are most directly related to the production and distribution of the firm’s products and services, which create value for the customer. Primary activities include inbound logistics, operations, outbound logistics, sales and marketing, and service. Inbound logistics includes receiving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

Support activities make the delivery of the primary activities possible and consist of organization infrastructure (administration and management), human resources (employee recruiting, hiring, and training), technology (improving products and the production process), and procurement (purchasing input).

Now you can ask at each stage of the value chain, “How can we use information systems to improve operational efficiency and improve customer and supplier intimacy?” This will force you to critically examine how you perform value-adding activities at each stage and how the business processes might be improved. For example, value chain analysis would indicate that Parker Hannifin should improve its processes for product pricing and product development. You can also begin to ask how information systems can be used to improve the relationship with customers and with suppliers who lie outside the firm value chain but belong to the firm’s extended value chain where they are absolutely critical to your success. Here, supply chain management systems that coordinate the flow of resources into your firm, and customer relationship management systems that coordinate your sales and support employees with customers are two of the most common system applications that result from a business value chain analysis. We discuss these enterprise applications in detail later in Chapter 8.

Figure 3-2
The Value Chain Model

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



Using the business value chain model will also cause you to consider benchmarking your business processes against your competitors or others in related industries, and identifying industry best practices. **Benchmarking** involves comparing the efficiency and effectiveness of your business processes against strict standards and then measuring performance against those standards. Industry **best practices** are usually identified by consulting companies, research organizations, government agencies, and industry associations as the most successful solutions or problem-solving methods for consistently and effectively achieving a business objective.

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

Extending the Value Chain: The Value Web

Figure 3-2 shows that a firm's value chain is linked to the value chains of its suppliers, distributors, and customers. After all, the performance of most firms depends not only on what goes inside a firm but also on how well the firm coordinates with direct and indirect suppliers, delivery firms (logistics partners, such as FedEx or UPS), and, of course, customers.

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

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

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

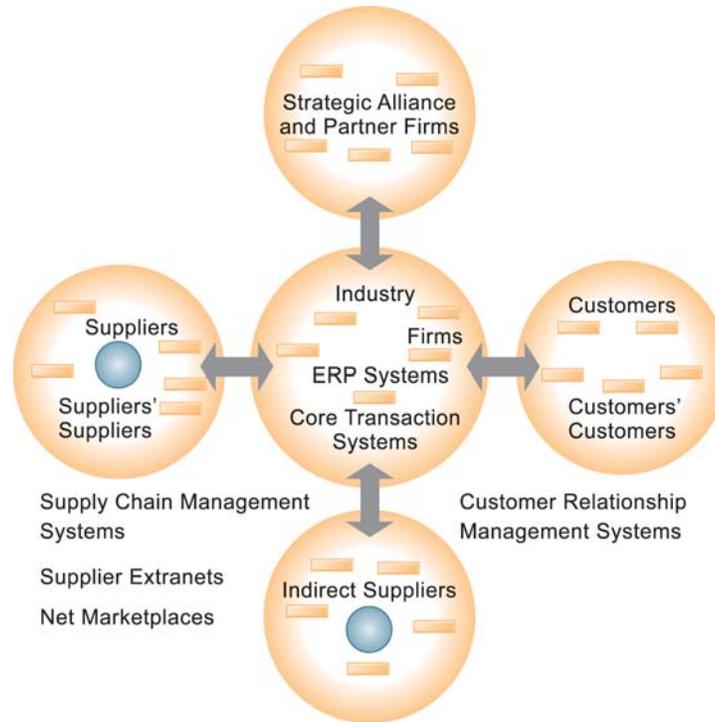
In fact, this is exactly what Amazon has done to make it one of the Web's most satisfying online retail shopping sites.

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

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

Figure 3-3 The Value Web

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



SYNERGIES, CORE COMPETENCIES, AND NETWORK-BASED STRATEGIES

A large corporation is typically a collection of businesses. Often, the firm is organized financially as a collection of strategic business units, and the returns to the firm are directly tied to the performance of all the strategic business units. For instance, General Electric—one of the largest industrial firms in the world—is a collection of aerospace, heavy manufacturing, electrical appliance, medical imaging, electronics, and financial services firms called business units. Information systems can improve the overall performance of these business units by promoting communication, synergies, and core competencies among the units.

Synergies

The idea of synergies is that when the output of some units can be used as inputs to other units, or two organizations can pool markets and expertise, these relationships lower costs and generate profits. Recent bank and financial firm mergers, such as the merger of JPMorgan Chase and Bank One Corporation and Bank of America and FleetBoston Financial Corporation, occurred precisely for this purpose.

One use of information technology in these synergy situations is to tie together the operations of disparate business units so they can act as a whole. For example, merging with Bank One provided JPMorgan Chase with a massive network of retail branches in the Midwest and Southwest. Information systems would help the merged banks lower retailing costs and increase cross-marketing of financial products.

Enhancing Core Competencies

Yet another way to use information systems for competitive advantage is to think about ways that systems can enhance core competencies. The argument is that the performance of all business units can increase insofar as these business units develop, or create, a central core of competencies. A **core competency** is an activity for which a firm is a world-class leader. Core competencies may involve being the world's best miniature parts designer, the best package delivery service, or the best thin-film manufacturer. In general, a core

competency relies on knowledge that is gained over many years of experience and a first-class research organization, or simply key people who follow the literature and stay abreast of new external knowledge.

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

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

Network-Based Strategies

Internet and networking technology have spawned strategies that take advantage of firms' abilities to create networks or network with each other. Network-based strategies include the use of network economics and a virtual company model.

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

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

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

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

vendor or when it needs to move quickly to exploit new market opportunities and lacks the time and resources to respond on its own.

Fashion companies, such as GUESS, Ann Taylor, Levi Strauss, and Reebok, enlist Hong Kong-based Li & Fung to manage production and shipment of their garments. Li & Fung handles product development, raw material sourcing, production planning, quality assurance, and shipping. Li & Fung does not own any fabric, factories, or machines, outsourcing all of its work to a network of more than 7,500 suppliers in 37 countries all over the world. Customers place orders to Li & Fung over its private extranet. Li & Fung then sends instructions to appropriate raw material suppliers and factories where the clothing is produced. The Li & Fung extranet tracks the entire production process for each order. Working as a virtual company keeps Li & Fung flexible and adaptable so that it can design and produce the products ordered by its clients in short order to keep pace with rapidly changing fashion trends.

DISRUPTIVE TECHNOLOGIES: RIDING THE WAVE

Sometimes a new technology comes along like a tsunami and destroys everything in its path. Some firms are able to create these tsunamis and ride the wave to profits; others learn quickly and are able to swim with the current; still others are obliterated because their products, services, and business models are obsolete. They may be very efficient at doing what no longer needs to be done! There are also cases where no firms benefit, and all the gains go to consumers (firms fail to capture any profits). Business history is filled with examples of **disruptive technologies**. Table 3.4 describes just a few disruptive technologies from the past and some from the likely near-term future.

Disruptive technologies are tricky. Firms that invent disruptive technologies as “first movers” do not always benefit if they lack the resources to really exploit the technology or fail to see the opportunity. The MITS Altair 8800 is widely considered the first PC, but its inventors did not take advantage of their first-mover status. Second movers, so-called

TABLE 3.4

Disruptive Technologies: Winners and Losers

Technology	Description	Winners and Losers
Transistor (1947)	Low power, compact, semiconductor switch that destroyed the vacuum tube industry	Transistor manufacturing firms win (Texas Instruments), while vacuum tube manufacturers decline (RCA, Sylvania)
Microprocessor chips (1971)	Thousands and eventually millions of transistors on a silicon chip	Microprocessor firms win (Intel, Texas Instruments), while transistor firms (GE) decline
Personal computers (1975)	Small, inexpensive, but fully functional desktop computers	PC manufacturers (HP, Apple, IBM) and chip manufacturers (Intel) prosper, while mainframe (IBM) and minicomputer (DEC) firms lose
PC word processing software (1979)	Inexpensive, limited but functional text editing and formatting for personal computers	PC and software manufacturers (Microsoft, HP, Apple) prosper, while the typewriter industry disappears
World Wide Web (1989)	A global database of digital files and “pages” instantly available	Owners of online content and news benefit, while traditional publishers (newspapers, magazines, and broadcast television) lose

TABLE 3.4

Continued...

Internet music (1998) services	Repositories of downloadable music on the Web with acceptable fidelity	Owners of online music collections (MP3.com, iTunes), telecommunications providers who own Internet backbone (ATT, Verizon), and local Internet service providers win, while record label firms and music retailers lose (Tower Records)
PageRank algorithm	A method for ranking Web pages in terms of their popularity to supplement Web search by key terms	Google wins (it owns the patent), while traditional key word search engines (Alta Vista) lose
Online video search algorithms	Using a family of techniques from speech recognition to text classification in order to make large video collections easily searchable	Online video search companies (Blinkx) win, while traditional search engines at Yahoo!, Amazon, and even Google are challenged
Software as Web service	Using the Internet to provide remote access to online software	Online software services companies (Salesforce.com) win, while traditional “boxed” software companies (Microsoft, SAP, Oracle) lose
Online print services	Using the Internet to provide remote access to digital printers and online designers	Online print process firms gain (digitalpressonline.com), while traditional printers lose (RR Donnelly)

“fast followers” such as IBM and Microsoft, reaped the rewards. ATMs revolutionized retail banking, but the inventor, Citibank, was copied by other banks, and ultimately all banks used ATMs with the benefits going mostly to the consumers. Google was not a first mover in search but an innovative follower that was able to patent a powerful new search algorithm called PageRank. So far it has been able to hold onto its lead while most other search engines have faded down to small market shares.

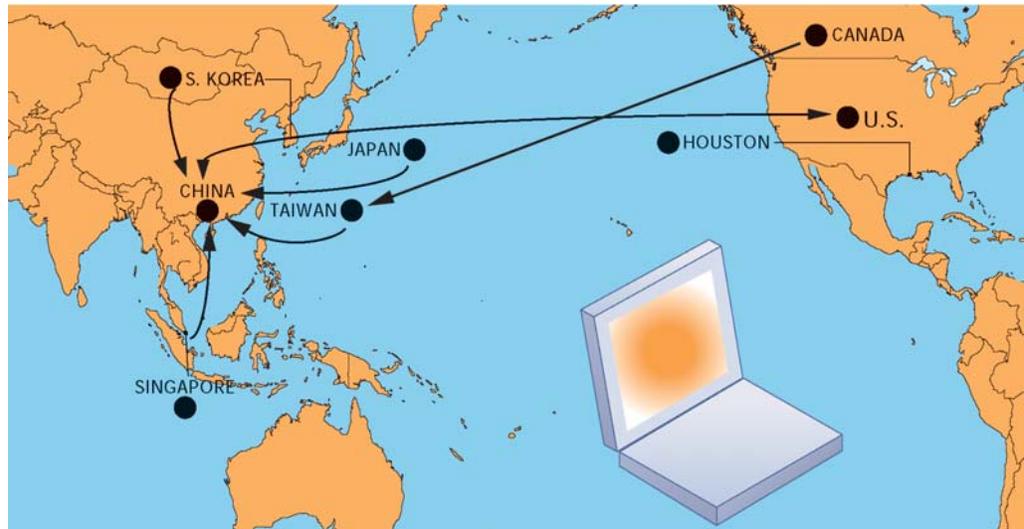
3.2 Competing on a Global Scale

Look closely at your jeans or sneakers. Even if they have a U.S. label, they were probably designed in California and stitched together in Hong Kong or Guatemala using materials from China or India. Call up Microsoft Help, or Verizon Help, and chances are good you will be speaking to a customer service representative located in India.

Consider the path to market for a Hewlett-Packard (HP) laptop computer, which is illustrated in Figure 3-4. The idea for the product and initial design came from HP’s Laptop Design Team in the United States. HP headquarters in Houston approved the concept. Graphics processors were designed in Canada and manufactured in Taiwan. Taiwan and South Korea provided the liquid-crystal display screens and many of the memory chips. The laptop’s hard disk drive came from Japan. Sources in China, Japan, Singapore, South Korea, and the United States supplied other components. Laptop assembly took place in China. Contractors in Taiwan did the machine’s engineering design and collaborated with the Chinese manufacturers.

Figure 3-4
An HP Laptop's Path to Market

Hewlett-Packard and other electronics companies assign distribution and production of their products to a number of different countries.



Firms pursuing a global strategy benefit from economies of scale and resource cost reduction (usually wage cost reduction). HP spread design, sourcing, and production for its laptops over multiple countries overseas to reduce logistics, tariffs, and labor costs. Digital content firms that produce Hollywood movies are able to sell millions more copies of DVDs of popular films by using foreign markets.

THE INTERNET AND GLOBALIZATION

Up until the mid-1990s, competing on a global scale was dominated by huge multinational firms, such as General Electric, General Motors, Toyota, and IBM. These large firms could afford huge investments in factories, warehouses, and distribution centers in foreign countries and proprietary networks and systems that could operate on a global scale. The emergence of the Internet into a full-blown international communications system has drastically reduced the costs of operating on a global scale, deepening the possibilities for large companies but simultaneously creating many opportunities for small and medium-sized firms.

The global Internet, along with internal information systems, puts manufacturing firms in nearly instant contact with their suppliers; Internet telephony permits millions of service calls to U.S. companies to be answered in India and Jamaica, just as easily and cheaply as if the help desk were in New Jersey or California. Likewise, the Internet makes it possible to move very large computer files with hundreds of graphics, or complex industrial designs, across the globe in seconds.

Small and medium-sized firms have created an entirely new class of “micromultinational firms.” For instance, CEO Brad Oberwager runs Sundia, a company which sells watermelon juice and fruit in the United States and Europe, out of his San Francisco home. Oberwager has employees in other parts of the United States as well as in India and the Philippines, and they use Web-based information systems to manage and coordinate. A Sundia employee in the Philippines is able to take orders from a Boston grocery store for watermelon juice made from Mexican fruit. The juice is squeezed in Washington State and payment goes to Oberwager in California (Copeland, 2006).

GLOBAL BUSINESS AND SYSTEM STRATEGIES

There are four main ways of organizing businesses internationally: domestic exporter, multinational, franchiser, and transnational, each with different patterns of organizational structure or governance. In each type of global business organization, business functions

may be centralized (in the home country), decentralized (to local foreign units), and coordinated (all units participate as equals).

The **domestic exporter** strategy is characterized by heavy centralization of corporate activities in the home country of origin. Production, finance/accounting, sales/marketing, human resources, and strategic management are set up to optimize resources in the home country. International sales are sometimes dispersed using agency agreements or subsidiaries, but foreign marketing is still totally reliant on the domestic home base for marketing themes and strategies. Caterpillar Corporation and other heavy capital-equipment manufacturers fall into this category of firm.

A **multinational** strategy concentrates financial management and control out of a central home base while decentralizing production, sales, and marketing operations to units in other countries. The products and services on sale in different countries are adapted to suit local market conditions. The organization becomes a far-flung confederation of production and marketing facilities in different countries. Many financial service firms, along with a host of manufacturers, such as General Motors, Chrysler, and Intel, fit this pattern.

Franchisers have the product created, designed, financed, and initially produced in the home country but rely heavily on foreign personnel for further production, marketing, and human resources. Food franchisers, such as McDonald's and Starbucks, fit this pattern. McDonald's created a new form of fast-food chain in the United States and continues to rely largely on the United States for inspiration of new products, strategic management, and financing. Nevertheless, local production of some items, local marketing, and local recruitment of personnel are required.

Transnational firms have no single national headquarters but instead have many regional headquarters and perhaps a world headquarters. In a **transnational** strategy, nearly all the value-adding activities are managed from a global perspective without reference to national borders, optimizing sources of supply and demand wherever they appear and taking advantage of any local competitive advantages. There is a strong central management core of decision making but considerable dispersal of power and financial muscle throughout the global divisions. Few companies have actually attained transnational status, but Citigroup, Sony, and Nestlé are attempting this transition.

Nestlé, the largest food and beverage company in the world, is one of the world's most globalized companies, with nearly 250,000 employees at 500 facilities in 200 countries. Nestlé launched a \$2.4 billion initiative to adopt a single set of business processes and systems for procurement, distribution, and sales management using mySAP enterprise software. All of Nestlé's worldwide business units use the same processes and systems for making sales commitments, establishing factory production schedules, billing customers, compiling management reports, and reporting financial results. Nestlé has learned how to operate as a single unit on a global scale.

GLOBAL SYSTEM CONFIGURATION

Figure 3-5 depicts four types of systems configuration for global business organizations. *Centralized systems* are those in which systems development and operation occur totally at the domestic home base. *Duplicated systems* are those in which development occurs at the home base but operations are handed over to autonomous units in foreign locations. *Decentralized systems* are those in which each foreign unit designs its own unique solutions and systems. *Networked systems* are those in which systems development and operations occur in an integrated and coordinated fashion across all units.

As can be seen in Figure 3-5, domestic exporters tend to have highly centralized systems in which a single domestic systems development staff develops worldwide applications. Multinationals allow foreign units to devise their own systems solutions based on local needs with few, if any, applications in common with headquarters (the exceptions being financial reporting and some telecommunications applications). Franchisers typically develop a single system, usually at the home base, and then replicate it around the world. Each unit, no matter where it is located, has identical applications. Firms such as Nestlé

Figure 3-5
Global Business Organization and Systems Configurations

The large Xs show the dominant patterns, and the small Xs show the emerging patterns. For instance, domestic exporters rely predominantly on centralized systems, but there is continual pressure and some development of decentralized systems in local marketing regions.

SYSTEM CONFIGURATION	Strategy			
	Domestic Exporter	Multinational	Franchiser	Transnational
Centralized	X			
Duplicated			X	
Decentralized	x	X	x	
Networked		x		X

organized along transnational lines use networked systems that span multiple countries using powerful telecommunications networks and a shared management culture that crosses cultural barriers.

3.3 Competing on Quality and Design

Quality has developed from a business buzzword into a very serious goal for many companies. Quality is a form of differentiation. Companies with reputations for high quality, such as Lexus or Nordstrom, are able to charge premium prices for their products and services. Information systems have a major contribution to make in this drive for quality. In the services industries in particular, quality strategies are generally enabled by superior information systems and services.

WHAT IS QUALITY?

Quality can be defined from both producer and customer perspectives. From the perspective of the producer, quality signifies conformance to specifications or the absence of variation from those specifications. The specifications for a telephone might include one that states the strength of the phone should be such that it will not be dented or otherwise damaged by a drop from a four-foot height onto a wooden floor. A simple test will allow this specification to be measured.

A customer definition of quality is much broader. First, customers are concerned with the quality of the physical product—its durability, safety, ease of use, and installation. Second, customers are concerned with the quality of service, by which they mean the accuracy and truthfulness of advertising, responsiveness to warranties, and ongoing product support. Finally, customer concepts of quality include psychological aspects: the company's knowledge of its products, the courtesy and sensitivity of sales and support staff, and the reputation of the product.

Today, as the quality movement in business progresses, the definition of quality is increasingly from the perspective of the customer. Customers are concerned with getting value for their dollar and product fitness, performance, durability, and support.

Many companies have embraced the concept of **total quality management (TQM)**. Total quality management makes quality the responsibility of all people and functions within an organization. TQM holds that the achievement of quality control is an end in itself. Everyone is expected to contribute to the overall improvement of quality—the engineer who avoids design errors, the production worker who spots defects, the sales representative who presents the product properly to potential customers, and even the secretary who avoids typing mistakes. TQM derives from quality management concepts developed by American quality experts, such as W. Edwards Deming and Joseph Juran, but the Japanese popularized it.

Another quality concept that is being widely implemented today is six sigma, which Amazon.com used to reduce errors in order fulfillment. **Six sigma** is a specific measure of

quality, representing 3.4 defects per million opportunities. Most companies cannot achieve this level of quality but use six sigma as a goal to implement a set of methodologies and techniques for improving quality and reducing costs. Studies have repeatedly shown that the earlier in the business cycle a problem is eliminated, the less it costs the company. Thus, quality improvements not only raise the level of product and service quality but they can also lower costs.

HOW INFORMATION SYSTEMS IMPROVE QUALITY

Let's examine some of the ways companies face the challenge of improving quality to see how information systems can be part of the process.

Reduce Cycle Time and Simplify the Production Process

Studies have shown that probably the best single way to reduce quality problems is to reduce **cycle time**, which refers to the total elapsed time from the beginning of a process to its end. Shorter cycle times mean that problems are caught earlier in the process, often before the production of a defective product is completed, saving some of the hidden costs of producing it. Finally, finding ways to reduce cycle time often means finding ways to simplify production steps. The fewer steps in a process, the less time and opportunity for an error to occur. Information systems help eliminate steps in a process and critical time delays.

800-Flowers, a multimillion-dollar company selling flowers by telephone or over the Web, used to be a much smaller company that had difficulty retaining its customers. It had poor service, inconsistent quality, and a cumbersome manual order-taking process. Telephone representatives had to write each order, obtain credit card approval, determine which participating florist was closest to the delivery location, select a floral arrangement, and forward the order to the florist. Each step in the manual process increased the chance of human error, and the whole process took at least a half hour. Owners Jim and Chris McCann installed a new information system that downloads orders taken in telecenters or over the Web to a central computer and electronically transmits them to local florists. Orders are more accurate and arrive at the florist within two minutes.

Benchmark

Companies achieve quality by using benchmarking to set strict standards for products, services, and other activities, and then measuring performance against those standards. Companies may use external industry standards, standards set by other companies; internally developed high standards; or some combination of the three. L.L.Bean, the Freeport, Maine, outdoor clothing company, used benchmarking to achieve an order-shipping accuracy of 99.9 percent. Its old batch order fulfillment system could not handle the surging volume and variety of items to be shipped. After studying German and Scandinavian companies with leading-edge order fulfillment operations, L.L.Bean carefully redesigned its order fulfillment process and information systems so that orders could be processed as soon as they were received and shipped within 24 hours.

Use Customer Demands to Improve Products and Services

Improving customer service, making customer service the number one priority, will improve the quality of the product itself. Delta Airlines decided to focus on its customers, installing a customer care system at its airport gates. For each flight, the airplane seating chart, reservations, check-in information, and boarding data are linked in a central database. Airline personnel can track which passengers are on board regardless of where they checked in and use this information to help passengers reach their destination quickly, even if delays cause them to miss connecting flights.

Improve Design Quality and Precision

Computer-aided design (CAD) software has made a major contribution to quality improvements in many companies, from producers of automobiles to producers of razor blades.

A **computer-aided design (CAD) system** automates the creation and revision of designs, using computers and sophisticated graphics software. The software enables users to create a digital model of a part, a product, or a structure and make changes to the design on the computer without having to build physical prototypes.

Clarion Malaysia, a manufacturer of sound and car audio electronics, used a CAD system to reduce the amount of time to design its products while creating new designs and improving their quality. Clarion implemented Catia V5 CAD software from Dassault Systems and IBM. Before implementing this software, Clarion Malaysia's designers needed 14 months to complete a new design model for a product. The software enables the company's design teams to complete a model in less than nine months. The time savings allow the company to be more competitive and to make more design revisions, which has improved product quality. Catia V5 has three-dimensional modeling capabilities that helped Clarion users grasp the nuances of design and see errors that would have been expensive if not detected until production.

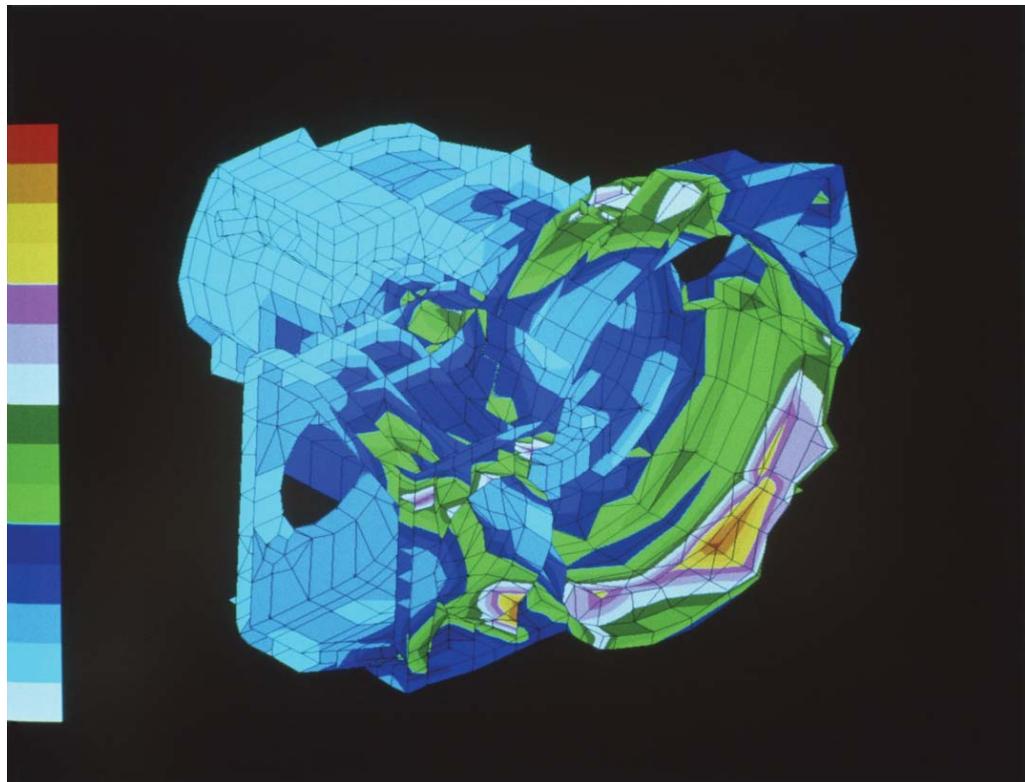
Improve Production Precision and Tighten Production Tolerances

For many products, quality can be enhanced by making the production process more precise, thereby decreasing the amount of variation from one part to another. CAD software often produces design specifications for tooling and manufacturing processes, saving additional time and money while producing a manufacturing process with far fewer problems. The user of this software is able to design a more precise production system, a system with tighter tolerances, than could ever be done manually. Clarion Malaysia's Catia software provided product data to tooling suppliers, which enabled them to cut tooling preparation time by 60 percent

3.4 Competing on Business Processes

Technology alone is often not enough to make organizations more competitive, efficient, or quality-oriented. The organization itself may need to be changed to take advantage of the

Computer-aided design (CAD) systems improve the quality and precision of product design by performing much of the design and testing work on the computer.



power of information technology. Sometimes these changes require minor adjustments in work activities, but, often, entire business processes may need to be redesigned. This radical rethinking and redesign of business processes to take advantage of information systems is called **business process reengineering (BPR)**.

BUSINESS PROCESS REENGINEERING

In business process reengineering, the steps required to accomplish a particular task are combined and streamlined to eliminate repetitive and redundant work. To reengineer successfully, the business must ask some basic questions: Why do we do what we do? Why do we do it the way we do? If we could start from scratch, what would we do now and how would we do it? Then the business needs to reinvent these processes anew, without regard to traditional responsibilities of workgroups, departments, or divisions.

Here's how reengineering worked for banks engaged in mortgage processing: The application process for a home mortgage used to take about six to eight weeks and cost about \$3,000. The goal of mortgage banks, such as Wells Fargo, Washington Mutual, and JPMorgan Chase, has been to reduce that cost to \$1,000 and the time to obtain a mortgage to about one week (see Figure 3-6).

In the past, a mortgage applicant filled out a paper loan application. The bank entered the application into its computer system. Specialists, such as credit analysts and underwriters from perhaps eight different departments, accessed and evaluated the application individually. If the loan application was approved, the closing was scheduled. After the closing, bank specialists dealing with insurance or funds in escrow serviced the loan. This "desk-to-desk" assembly-line approach might take up to 17 days.

The banks replaced the sequential desk-to-desk approach with a speedier "work cell" or team approach. Now, loan originators in the field enter the mortgage application directly into laptop computers. Software checks the application transaction to make sure that all of the information is correct and complete. The loan originators transmit the loan applications over a network to regional production centers. Instead of working on the application individually, the credit analysts, loan underwriters, and other specialists convene electronically, working as a team to approve the mortgage.

After closing, another team of specialists sets up the loan for servicing. The entire loan application process can take as little as two days. Loan information is easier to access than before, when the loan application could be in eight or nine different departments. Loan originators also can dial into the bank's network to obtain information on mortgage loan costs or to check the status of a loan for the customer.

By radically rethinking their approaches to mortgage processing, mortgage banks have achieved remarkable efficiencies. They have not focused on redesigning a single business process but instead they have reexamined the entire set of logically connected processes required to obtain a mortgage.

To support the new mortgage application process, the banks have implemented workflow and document management software. **Workflow management** is the process of streamlining business procedures so that documents can be moved easily and efficiently. Workflow and document management software automates processes, such as routing documents to different locations, securing approvals, scheduling, and generating reports. Two or more people can work simultaneously on the same document, allowing much quicker completion time. Work need not be delayed because a file is out or a document is in transit. And with a properly designed indexing system, users will be able to retrieve files in many different ways, based on the content of the document.

STEPS IN EFFECTIVE REENGINEERING

One of the most important strategic decisions that a firm can make is not deciding how to use computers to improve business processes but rather understanding what business processes need improvement. When systems are used to strengthen the wrong business

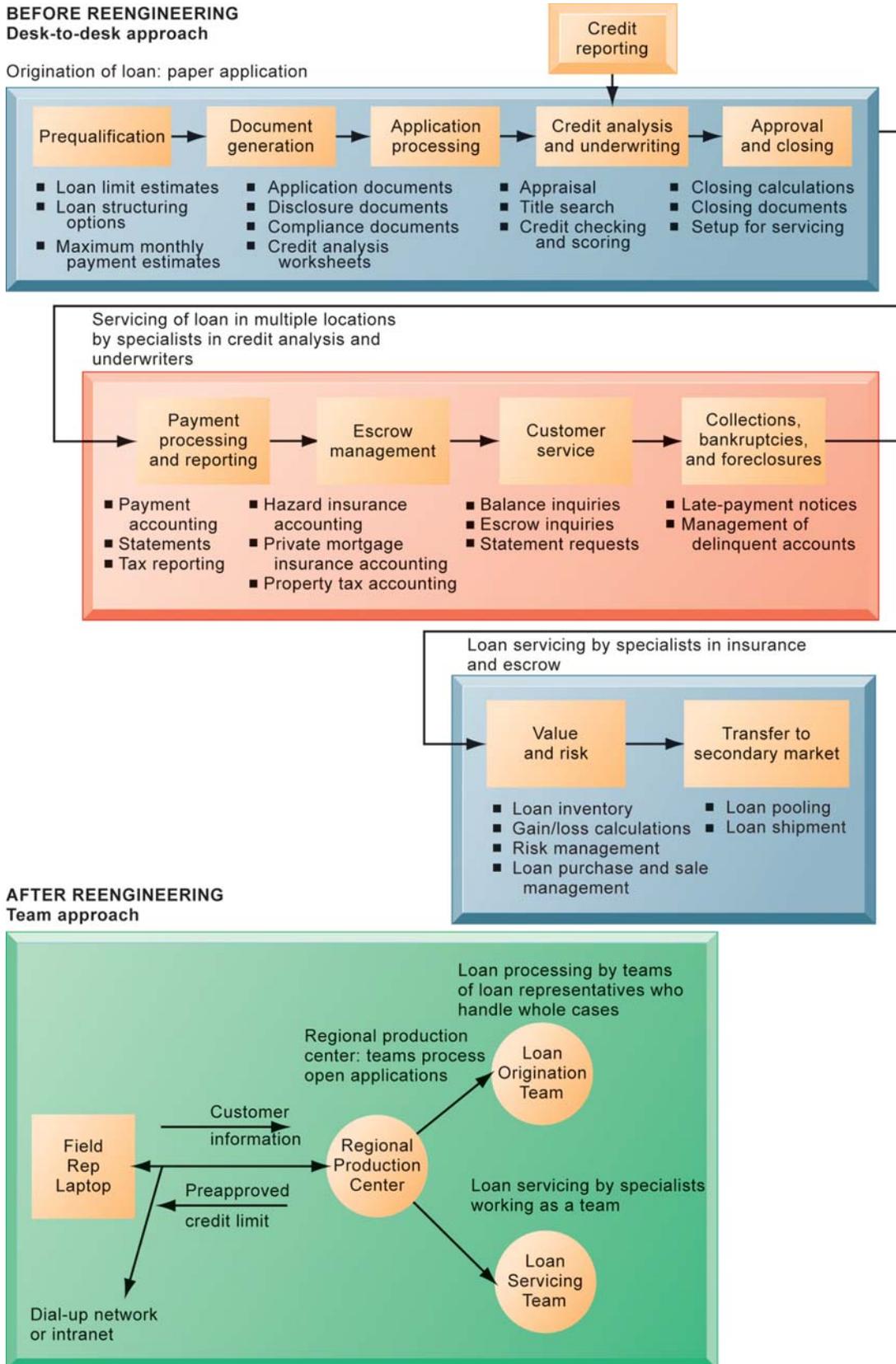


Figure 3-6
Redesigning Mortgage Processing in the United States

By redesigning their mortgage processing systems and the mortgage application process, mortgage banks are able to reduce the costs of processing the average mortgage from \$3,000 to \$1,000 and reduce the time of approval from six weeks to one week or less. Some banks are even preapproving mortgages and locking interest rates on the same day the customer applies.

model or business processes, the business can become more efficient at doing what it should not do. As a result, the firm becomes vulnerable to competitors who may have discovered the right business model. Considerable time and cost may also be spent improving business processes that have little impact on overall firm performance and revenue. Managers need to determine what business processes are the most important to focus on when applying new information technology and how improving these processes will help the firm execute its strategy.

Management must also understand and measure the performance of existing processes as baselines. If, for example, the objective of reengineering is to reduce time and cost in developing a new product or filling an order, the business needs to measure the time and cost consumed by the unchanged process. For instance, before reengineering, Cemex, the international provider of cement and ready-mix concrete, required an average time of three hours to make a delivery. After Cemex's processes were reengineered, average delivery time dropped to 20 minutes.

Following these steps does not automatically guarantee that reengineering will always be successful. Many reengineering projects do not achieve breakthrough gains in business performance because the organizational changes are often very difficult to manage. Managing change is neither simple nor intuitive, and companies committed to reengineering need a good change-management strategy (see Chapter 11).

3.5 Hands-On MIS

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

IMPROVING DECISION MAKING: ANALYZING COMPETITIVE STRATEGY

Software skills: Web browser software and presentation software

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



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

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

- Which activities at Dirt Bikes create the most value?
- How does Dirt Bikes provide value to its customers?
- What other companies are Dirt Bikes's major competitors? How do their products compare in price to those of Dirt Bikes? What are some of the product features they emphasize?
- What are the competitive forces that can affect the industry?
- What competitive strategy should Dirt Bikes pursue?
- What information systems best support that strategy?
- (Optional) Use electronic presentation software to summarize your findings for management.

IMPROVING DECISION MAKING: USING A DATABASE TO CLARIFY BUSINESS STRATEGY

Software skills: Database querying and reporting; database design

Business skills: Reservation systems; customer analysis

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

The Presidents' Inn is a small three-story hotel on the Atlantic Ocean in Cape May, New Jersey, a popular northeastern U.S. resort. Ten rooms overlook side streets, 10 rooms have bay windows that offer limited views of the ocean, and the remaining 10 rooms in the front of the hotel face the ocean. Room rates are based on room choice, length of stay, and number of guests per room. Room rates are the same for one to four guests. Fifth and sixth guests must pay an additional \$20 charge each per day. Guests staying for seven days or more receive a 10 percent discount on their daily room rates.

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

ID	Guest First Name	Guest Last Name	Room	Room Type	Arrival Date	Departure Date	No of Guests	Daily Rate
1	Barry	Lloyd	Hayes	Bay-window	12/1/2007	12/4/2007	2	\$150.00
2	Michael	Lunsford	Cleveland	Ocean	12/1/2007	12/9/2007	3	\$112.50
3	Kim	Kyuong	Coolidge	Bay-window	12/4/2007	12/7/2007	1	\$150.00
4	Edward	Holt	Washington	Ocean	12/1/2007	12/3/2007	4	\$325.00
5	Thomas	Collins	Lincoln	Ocean	12/9/2007	12/13/2007	2	\$300.00
6	Paul	Bodkin	Coolidge	Bay-window	12/1/2007	12/3/2007	2	\$150.00
7	Randall	Battenburg	Washington	Ocean	12/4/2007	12/12/2007	2	\$292.50
8	Calvin	Nowotney	Lincoln	Ocean	12/2/2007	12/4/2007	1	\$300.00
9	Homer	Gonzalez	Lincoln	Ocean	12/5/2007	12/7/2007	5	\$320.00
10	David	Sanchez	Jefferson	Bay-window	12/5/2007	12/7/2007	2	\$175.00

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

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

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

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

IMPROVING DECISION MAKING: USING WEB TOOLS TO CONFIGURE AND PRICE AN AUTOMOBILE

Software skills: Internet-based software

Business skills: Researching product information and pricing

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

You are interested in purchasing a new Ford Escape (if you are personally interested in another car, domestic or foreign, investigate that one instead). Go to the Web site of CarsDirect (www.carsdirect.com) and begin your investigation. Locate the Ford Escape. Research the various specific automobiles available in that model and determine which you prefer. Explore the full details about the specific car, including pricing, standard features, and options. Locate and read at least two reviews if possible. Investigate the safety of that model based on the U.S. government crash tests performed by the National Highway Traffic Safety Administration if those test results are available. Explore the features for locating a vehicle in inventory and purchasing directly. Finally, explore the other capabilities of the CarsDirect site for financing.

Having recorded or printed the information you need from CarsDirect for your purchase decision, surf the Web site of the manufacturer, in this case Ford (www.ford.com). Compare the information available on Ford's Web site with that of CarsDirect for the Ford Escape. Be sure to check the price and any incentives being offered (which may not agree with what you found at CarsDirect). Next, find a dealer on the Ford site so that you can view the car before making your purchase decision. Explore the other features of Ford's Web site.

LEARNING TRACKS

The following Learning Tracks provide content relevant to topics covered in this chapter:

1. Challenges of Information Systems for Competitive Advantage

Try to locate the lowest price for the car you want in a local dealer's inventory. Which site would you use to purchase your car? Why? Suggest improvements for the sites of CarsDirect and Ford.

Review Summary

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

2 How do the value chain and value web models help businesses identify opportunities for strategic information system applications? The value chain model highlights specific activities in the business where competitive strategies and information systems will have the greatest impact. The model views the firm as a series of primary and support activities that add value to a firm's products or services. Primary activities are directly related

to production and distribution, whereas support activities make the delivery of primary activities possible. A firm's value chain can be linked to the value chains of its suppliers, distributors, and customers. A value web consists of information systems that enhance competitiveness at the industry level by promoting the use of standards and industry-wide consortia, and by enabling businesses to work more efficiently with their value partners.

3 How do information systems help businesses use synergies, core competences, and network-based strategies to achieve competitive advantage? Because firms consist of multiple business units, information systems achieve additional efficiencies or enhanced services by tying together the operations of disparate business units. Information systems help businesses leverage their core competencies by promoting the sharing of knowledge across business units. Information systems facilitate business models based on large networks of users or subscribers that take advantage of network economics. A virtual company strategy uses networks to link to other firms so that a company can use the capabilities of other companies to build, market, and distribute products and services. Disruptive technologies provide strategic opportunities, although “first movers” do not necessarily obtain long-term benefit.

4 How do competing on a global scale and promoting quality enhance competitive advantage? Information systems and the Internet can help companies operate internationally by facilitating coordination of geographically dispersed units of the company and communication with faraway customers and suppliers. Information systems can enhance quality by simplifying a product or service, facilitating benchmarking, reducing product development cycle time, and improving quality and precision in design and production.

5 What is the role of business process reengineering (BPR) in enhancing competitiveness? Organizations often have to change their business processes in order

Key Terms

Benchmarking, 93	Domestic exporter, 99	Strategic transitions, 00
Best practices, 93	Efficient customer response system, 85	Support activities, 92
Business process reengineering (BPR), 103	Franchiser, 99	Total quality management (TQM), 100
Competitive forces model, 82	Mass customization, 86	Transnational, 99
Computer-aided design (CAD) system, 102	Multinational, 99	Value chain model, 91
Core competency, 94	Network economics, 95	Value web, 93
Cycle time, 101	Primary activities, 92	Virtual company, 95
Disruptive technologies, 96	Quality, 100	Workflow management, 103
	Six sigma, 101	

Review Questions

- How does Porter's competitive forces model help companies develop competitive strategies using information systems?
 - Define Porter's competitive forces model and explain how it works.
 - List and describe four competitive strategies enabled by information systems that firms can pursue.

- Describe how information systems can support each of these competitive strategies and give examples.
 - Explain why aligning IT with business objectives is essential for strategic use of systems.
- 2.** How do the value chain and value web models help businesses identify opportunities for strategic information system applications?
- Define and describe the value chain model.
 - Explain how the value chain model can be used to identify opportunities for information systems.
 - Define the value web and show how it is related to the value chain.
 - Explain how the value web helps businesses identify opportunities for strategic information systems.
 - Describe how the Internet has changed competitive forces and competitive advantage.
- 3.** How do information systems help businesses use synergies, core competencies, and network-based strategies to achieve competitive advantage?
- Explain how information systems promote synergies and core competencies.
 - Describe how promoting synergies and core competencies enhances competitive advantage.
 - Explain how businesses benefit by using network economics.
 - Define and describe a virtual company and the benefits of pursuing a virtual company strategy.
 - Explain how disruptive technologies create strategic opportunities.
- 4.** How do competing on a global scale and promoting quality enhance competitive advantage?
- Describe how globalization has increased opportunities for businesses.
 - List and describe the four main ways of organizing a business internationally and the types of systems configuration for global business organizations.
 - Define quality and compare the producer and consumer definitions of quality.
 - Describe the various ways in which information systems can improve quality.
- 5.** What is the role of business process reengineering (BPR) in enhancing competitiveness?
- Define business process reengineering (BPR) and explain how it helps firms become more competitive.
 - Define workflow management and explain how it is related to BPR.
 - List and describe the steps companies should take to make sure BPR is successful.

Discussion Questions

- 1.** It has been said that there is no such thing as a sustainable competitive advantage. Do you agree? Why or why not?
- 2.** What are some of the issues to consider in determining whether the Internet would provide your business with a competitive advantage?

Video Case

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

Teamwork

Identifying Opportunities for Strategic Information Systems

With a group of three or four students, select a company described in *The Wall Street Journal*, *Fortune*, *Forbes*, or another business publication. Visit the company's Web site to find additional information about that company and to see how the firm is using the Web. On the basis of this information, identify important business processes and the firm's business strategy. Suggest information systems that might give that particular business a competitive advantage, including those based on Internet technology, if appropriate. If possible, use electronic presentation software to present your findings to the class.

BUSINESS PROBLEM-SOLVING CASE

YouTube, the Internet, and the Future of Movies

The Internet has transformed the music industry. Sales of CDs in retail music stores have been declining while sales of songs downloaded through the Internet to iPods and other portable music players are skyrocketing. And the music industry is still contending with millions of people illegally downloading songs for free. Will the motion picture industry have a similar fate?

Increased levels of high-speed Internet access, powerful PCs with DVD readers and writers, portable video devices, and leading-edge file sharing services have made downloading of video content faster and easier than ever. Free and often illegal video downloads are currently outpacing paid video downloads by four to one. But the Internet is also providing new ways for movie and television studios to distribute and sell their content, and they are trying to take advantage of that opportunity.

In April 2006, six movie studios, including Warner Brothers, Sony Pictures, Universal, MGM, and Paramount, reached an agreement with Web site Movielink to sell movies online via download. Until that time, Movielink had offered movie downloads as rentals, which, like the video-on-demand model, the customer could watch for only 24 hours. Sony, MGM, and Lions Gate also reached agreements with a Movielink competitor, CinemaNow, which is partially owned by Lions Gate. Warner Brothers also expanded its presence by entering into relationships with video downloading services Guba.com and BitTorrent. The studios moved to build on the momentum created by the success of the iTunes music store, which demonstrated that consumers were very willing to pay for legal digital downloads of copyrighted material. At the same time, they hoped that entering the download sales market would enable them

to confront the piracy issue in their industry earlier in its development than the music industry was able to do.

What remained a question was whether the studios could replicate the success of iTunes. The initial pricing schemes certainly did not offer the same appeal as Apple's \$0.99 per song or \$9.99 per CD. Movielink set the price for new movies at \$20 to \$30. Older movies were discounted to \$10. Movielink was counting on the fact that customers would pay more for the immediacy of downloading a movie in their homes, as opposed to visiting a bricks-and-mortar store such as Circuit City or an online store such as Amazon.com, both of which sell new DVDs for less than \$15.

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

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

Right around the time that the studios were making their foray into Web distribution, a new challenge emerged. YouTube, which started up in February 2005, quickly became the most popular video-sharing Web site in the world. Even though YouTube's original mission was to provide an outlet for amateur filmmakers, digital rights management issues immediately emerged.

Sure enough, video clips of copyrighted Hollywood movies and television shows soon proliferated on YouTube right alongside the video diaries created by teenagers with webcams and the amateur films created by film students. YouTube measures to discourage its users from posting illegal clips included limiting the length of videos to 10 minutes and removing videos at the request of the copyright owner. It was, however, a losing battle. Clips from popular movies and shows were often posted by multiple users, and they could be reposted as quickly as they were removed. And watching a two-hour movie in twelve 10-minute pieces proved to be a small price to pay to view the movie for free.

No one knows how much Hollywood-derived content is submitted to YouTube without the studios' permission. Academics and media executives estimate it ranges from 30 to 70 percent.

When Google purchased YouTube in 2006 for \$1.65 billion, the site gained considerable clout in the media world. With YouTube reporting 100 million video views per day and becoming one of the most visited Web sites on the entire Web, the major production studios were not going to stand idly by while someone else profited off of movies that cost them an average of \$95 million to make. NBC Universal, for example, assigned three employees to search YouTube every day for property that had been posted without permission. NBC Universal makes over 1,000 requests per month to remove its material from YouTube.

Of course, in the end, the chase probably is not worthwhile. Rick Cotton, NBC Universal's general counsel, admitted, "There is only so much we can do." Rather than pursue an unachievable goal, some of the major studios, including NBC Universal, Time Warner's Warner Brothers Entertainment, and News Corporation's Twentieth Century Fox, sought more constructive solutions. They entered into negotiations with YouTube to establish licensing agreements that would make copyrighted content available legally. The licensing model was already in place between YouTube and several major music companies. Furthermore, YouTube had already engineered successful arrangements with major studios to market movies on the site.

The studios clearly recognize the value of getting exposure for their movies on such a heavily trafficked Web site. Marc Shmuger, chairman of Universal Pictures, noted that his company's marketing team distributed promotional video clips of all its new films to

Web sites such as YouTube. Of course, the studios could not expect users to voluntarily ignore illegal clips in favor of the approved ones, or even discern the difference between them. So, it made sense for the movie industry to follow the lead of the music industry, where the focus shifted from killing off illegal uploads to taking advantage of digital music as a new source of revenue.

What happens when the two sides can't agree on terms? In some cases, the studios have to tread lightly because of their diverse interests in the media. For example, News Corporation also owns MySpace, which itself houses untold numbers of unauthorized music and video clips that are posted by users. The delicate balance between vigilance and public relations surfaced in January 2007 when News Corporation filed a subpoena in a U.S. District Court to compel Google to turn over the identity of a user who uploaded episodes of the Fox Television programs *24* and *The Simpsons* to YouTube. Fox was simply looking to protect its copyrights, but the network risked angering fans of the shows, as well as fans of YouTube, if it pursued the individual too aggressively. Moreover, News Corporation could come across as hypocritical for seeking to punish a YouTube user while so many of users of MySpace were permitted to engage in the same behavior.

In early 2007, YouTube revealed its intention to explore a revenue-sharing model. By sharing revenue with content creators, YouTube might be able to return the focus of the site to its original purpose, and steer users away from the practice of uploading their favorite copyrighted material. Metacafe and Revver, two other video-sharing sites, already had such models in place. Metacafe's producer rewards program pays users \$5 for every 1,000 views once their original creations surpass a threshold of 20,000 views. Revver attaches pay-per-click advertisements to the end of videos and then splits evenly the revenue generated by ad clicks with the video creator.

Sharing revenue would improve YouTube's image in the eyes of both advertisers and users. Advertisers would know that they weren't sponsoring stolen material and tacitly approving of YouTube's profiting from content it had no right to possess. Users would be more motivated to produce and upload high-quality original videos knowing that YouTube wasn't getting all of the financial reward. One possible danger is the temptation for users to steal high-quality content and pass it off as their own in order to reap the rewards. Therefore, it is critical for YouTube to continue developing the filtering and digital fingerprinting technology that it has promised.

Whatever the motion picture studios' relationship to YouTube, it remains to be seen whether streaming video can actually be profitable. Screen Digest, a London research firm, forecasts that 55 percent of the video

content watched in the United States in 2010 will be in the form of video streams—44 billion of them. However, that 55 percent of the video content will only account for 15 percent of the revenues produced by video content. A large part of the problem is that the videos that are most popular online are the least attractive to advertisers due to inappropriate or objectionable material, or because they are simply dull.

For all of the players in the movie game—studios, video-sharing sites, rental companies—partnerships and revenue sharing seem the best choice for maximizing the revenue streams made possible by new technology. However, that hasn't stopped the various players from continuing to seek the next competitive edge in order to get a bigger piece of the pie. Netflix introduced a streaming video service that enables subscribers to watch movies on their PCs instantaneously with no fees beyond what a subscriber is already paying for a membership. The membership level determines how many hours of streaming video the subscriber receives per month. Blockbuster launched its Total Access program to give online movie renters additional convenience. In addition to returning their movies through the mail, subscribers may return them to a Blockbuster store and receive a free movie or game rental.

The studios continue to seek out more partners for movie downloads. The six major studios reached an agreement with Wal-Mart to allow the discount-shopping giant to sell movie downloads from its Web site. Wal-Mart joined iTunes, CinemaNow, Amazon, and others who already had such deals. All will now compete on pricing and ease-of-use of their Web sites. Two things are certain: technology will continue to advance—Apple, AOL, and others planned devices to broadcast video from computers directly to televisions; and lawyers will continue to argue concepts such as liability and fair use.

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Case Study Questions

1. What competitive forces have challenged the movie industry? What problems have these forces created? What changes have these problems caused the movie and television studios to make?
2. Describe the impact of disruptive technology on the motion picture industry.
3. How have the movie studios responded to YouTube? What is the goal of the response? What can the movie studios learn from the music industry's dealings with online digital music and copyright infringement?
4. Should motion picture companies continue to use YouTube to promote their new films? Why or why not?
5. Go to YouTube.com and search for videos from your favorite movie or television show. What do you find on the site? To whom do you assign more responsibility for unauthorized copyrighted material appearing on the site, the users who uploaded it or YouTube? If you wrote or produced a television show or movie, what would be a fair arrangement for your work to appear on YouTube? Would you allow your work to circulate freely on the Internet? If not, how should you be compensated? What measures would you be willing to take to enforce your copyright?