

2

Gaining Competitive Advantage Through Information Systems

Preview

This chapter examines how organizations can use information systems (IS) strategically, enabling them to gain or sustain competitive advantage over their rivals. As described in Chapter 1, “Managing in the Digital World,” a firm has competitive advantage over rival firms when it can do something better, faster, more economically, or uniquely. In this chapter, we begin by examining the role of information systems at different levels of the organization. We then examine how information systems support various business models and introduce innovative business models enabled by information systems. Finally, we talk about the continual need to find innovative ways to succeed with and through information systems.

Over 10 million students improved their results using the Pearson MyLabs. Visit **mymlab.com** for simulations, tutorials, and end-of-chapter problems.

MyLab MIS™

MANAGING IN THE DIGITAL WORLD:

Startups and New Business Models

In addition to enabling new products and services, rapid advances in the capabilities of information technology enable entirely new business models. Some are refinements to existing approaches, others can be highly disruptive. Just because technology enables an innovative business model, however, does not mean that it can be easily or successfully implemented.

Examples of technology-enabled business models include operating a platform, cutting out the middleman, selling subscriptions, and providing on-demand services. Companies building a platform enable others—both other businesses and users—to co-create value. In this business model, companies like Airbnb use technology to facilitate information gathering, identify willing participants, and simplify transactions. Cutting out the middleman (or disintermediation) means bypassing traditional retail channels and interacting directly with customers (Figure 2.1). Using this business model, eyeglass vendor Warby Parker and mattress seller Casper use technology to disrupt traditional distribution channels and directly connect with buyers. Subscription-based services are facilitated by technology through the removal of friction from the transaction—the initial sign-up is greatly simplified through online forms, parameters of the subscription can easily be adjusted,

After reading this chapter, you will be able to do the following:

1. Discuss how information systems can be used for automation, organizational learning, and strategic advantage.
2. Describe how information systems support business models used by companies operating in the digital world.
3. Explain why and how companies are continually looking for innovative ways to use information systems for competitive advantage.

and payment is made easy through digital transactions. All this adds up to a great opportunity to gain sustained revenue for startups and hassle-free experiences for customers. Netflix, Spotify, and Dollar Shave Club are examples of businesses that have recently been very successful with the subscription model. Lastly, on-demand services have grown tremendously. Mobile and location-based technologies have allowed substantial new opportunities on both the supply and demand side to enable on-demand services. The most widely cited example is the car-hailing service Uber, with countless others who are trying to replicate Uber's success.

A technology-enabled business model is not a guarantee of success. Many businesses trying to replicate Uber's success in the on-demand arena have struggled, as not all goods and services are well suited to this approach. There are certain aspects of transportation and other services that make them well suited for on-demand delivery. In contrast, markets where there are high and varied standards for customer satisfaction such as house cleaning and dining, with an abundance of ready substitutes such as local cleaners and restaurants, may face particular challenges. However, with the rise in innovative business models, it might be only a matter of time until a startup will come up with a suitable business model.

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

1. What is the role of information systems and strategy in identifying a business model?

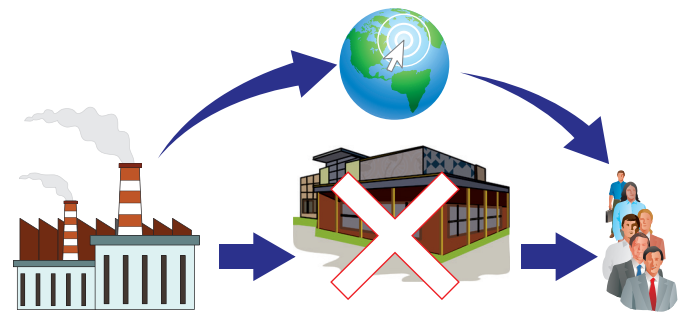


FIGURE 2.1

Technology enables new business models, such as cutting out the middleman and bypassing traditional retail channels to interact directly with customers.

2. How have information systems enabled new, interesting business models like that of Uber, Spotify, and Airbnb?
3. How can organizations identify innovative technologies that form the basis for innovative business models?

Based on:

Kessler, S. (2016, March 29). Why a new generation of on-demand businesses rejected the Uber model. *Fast Company*. Retrieved May 29, 2016, from <http://www.fastcompany.com/3058299/why-a-new-generation-of-on-demand-businesses-rejected-the-uber-model>

Tomaro, N. (2015, August 6). 9 proven business models to consider for your startup. *Huffington Post*. Retrieved May 29, 2016, from http://www.huffingtonpost.com/nina-tomaro/9-proven-business-models-_b_7949932.html

Enabling Organizational Strategy through Information Systems

In Chapter 1, we introduced the notion that information systems can have strategic value to an organization. Because organizations are composed of different levels and functions, a broad range of information is needed to support an organization's business processes. **Business processes** are the activities organizations perform in order to reach their business goals, including core activities that transform inputs and produce outputs, and supporting activities that enable the core activities to take place. As a review, we briefly describe how organizations are generally structured as well as the common functional areas of most modern organizations. Understanding how organizations are structured helps to illustrate how different types of information systems can support various business processes and provide different levels of value to the organization.

Organizational Decision-Making Levels

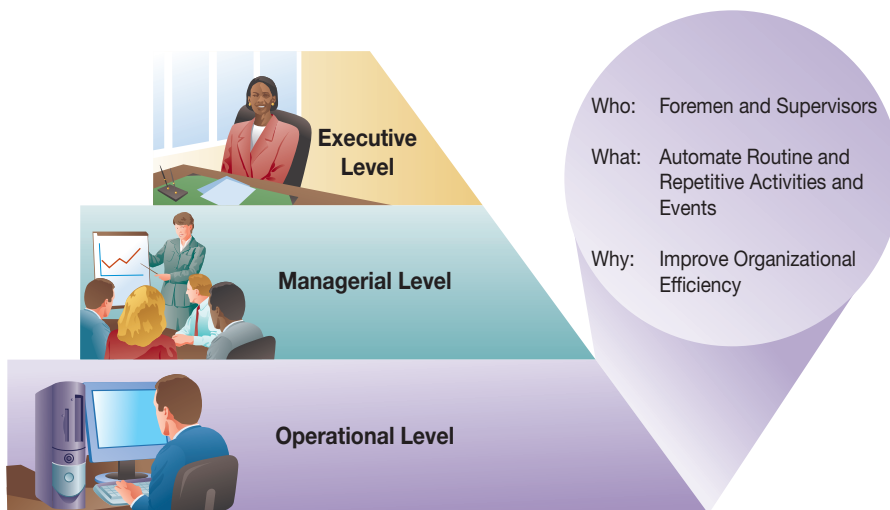
Every organization is composed of different decision-making levels, as illustrated in Figure 2.2. Each level of an organization has different responsibilities and, therefore, different informational needs.

OPERATIONAL LEVEL. At the **operational level** of a firm, the routine, day-to-day business processes and interactions with customers occur. Information systems at this level are designed to automate repetitive activities, such as processing sales transactions, and to improve the efficiency of business processes at the customer interface. A **transaction** refers to anything that occurs as part of a firm's daily business of which it must keep a record. Operational planning typically has a time frame of a few hours or days, and the managers at the operational level, such as foremen or supervisors, make day-to-day decisions that are highly structured and recurring. **Structured decisions** are those in which the procedures to follow for a given situation can be specified in advance. Because structured decisions are relatively straightforward, they can be programmed directly into operational information systems so that they can be made with little or no human intervention. For example, an inventory management system for a shoe store in the mall could keep track of inventory and issue an order for additional inventory when levels drop below a specified level. Operational managers within the store would simply need to confirm with the inventory management system that the order for additional shoes was needed. At the operational level, information systems are typically used to increase **efficiency** (i.e., the extent to which goals are accomplished faster, at lower cost, or with relatively little time and effort) by optimizing processes and better understanding the underlying causes of any performance problems. Using information systems to optimize processes at the operational level can offer quick returns on the IS investment, as activities at this level are clearly delineated and well-focused. Figure 2.3 summarizes the general characteristics of the operational level.

FIGURE 2.2

Organizations are composed of different decision-making levels.

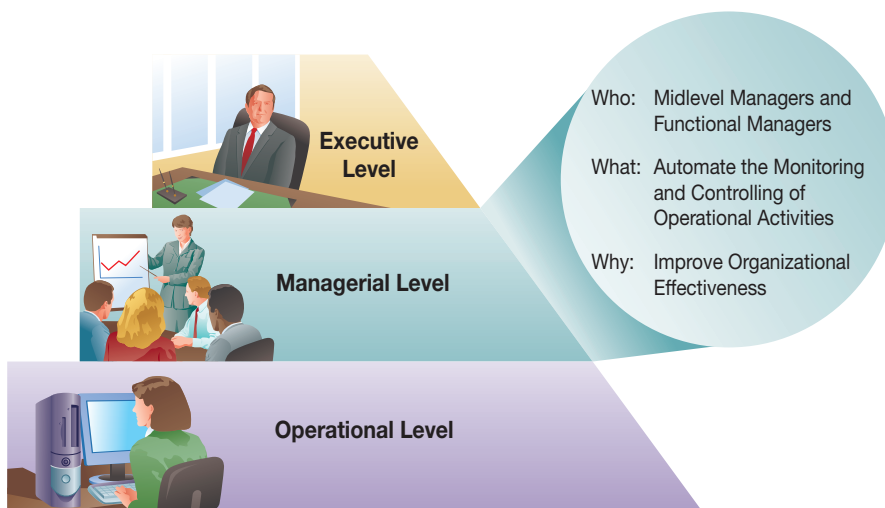


**FIGURE 2.3**

Information systems at the operational level of an organization help to improve efficiency by automating routine and repetitive activities.

MANAGERIAL/TACTICAL LEVEL. At the **managerial level** (or tactical level) of the organization, functional managers (e.g., marketing managers, finance managers, manufacturing managers, human resource managers) focus on monitoring and controlling operational-level activities and providing information to higher levels of the organization (Figure 2.4). Managers at this level, referred to as midlevel managers, focus on effectively utilizing and deploying organizational resources to increase **effectiveness** (i.e., the extent to which goals or tasks are accomplished well) to achieve the strategic objectives of the organization. Midlevel managers typically focus on problems within a specific business function, such as marketing or finance. Here, the scope of the decision usually is contained within the business function, is moderately complex, and has a time horizon of a few days to a few months (also referred to as tactical planning). For example, a marketing manager at Nike may decide how to allocate the advertising budget for the next business quarter or some other fixed time period.

Managerial-level decision making is not nearly as structured or routine as operational-level decision making. Managerial-level decision making is referred to as semistructured decision making because solutions and problems are not clear-cut and often require judgment and expertise. For **semistructured decisions**, some procedures to follow for a given situation can be specified in advance, but not to the extent where a specific recommendation can be made. For example, a business intelligence system could provide a production manager at Nike with performance analytics and forecasts about sales for multiple product lines, inventory levels, and overall production capacity. The metrics deemed most critical to assessing progress toward a

**FIGURE 2.4**

Information systems at the managerial level of an organization help to improve effectiveness by automating the monitoring and controlling of operational activities.

certain goal (referred to as **key performance indicators [KPIs]**) are displayed on *digital dashboards* (see Chapter 6, “Enhancing Business Intelligence Using Big Data and Analytics”). The manager could use this information to create multiple hypothetical production schedules. With these schedules, the manager could then perform predictive analyses to examine inventory levels and potential sales profitability, depending on the order in which manufacturing resources were used to produce each type of product.

EXECUTIVE/STRATEGIC LEVEL. At the **executive level** (or strategic level) of the organization, managers focus on long-term strategic questions facing the organization, such as which products to produce, which countries to compete in, and what organizational strategy to follow (Figure 2.5). Managers at this level include the president and chief executive officer, chief information officer, vice presidents, and possibly the board of directors; they are referred to as “executives.” Executive-level decisions deal with complex problems with broad and long-term ramifications for the organization. Executive-level decisions are referred to as unstructured decisions because the problems are relatively complex and nonroutine. In addition, executives must consider the ramifications of their decisions in terms of the overall organization. For **unstructured decisions**, few or no procedures to follow for a given situation can be specified in advance. For example, top managers may decide to develop a new product or discontinue an existing one. Such a decision may have vast, long-term effects on the organization’s levels of employment and profitability. To assist executive-level decision making, information systems are used to obtain aggregate summaries of trends and projections of the future. At the executive level, information systems provide KPIs that are focused on balancing performance across the organization, such that, for example, product launches are staggered to smooth out the effects of spikes in demand on the supply chain. Other KPIs are used to benchmark the organization’s performance against its competitors. Likewise, information systems used for executive-level decisions need to take into account various types of unstructured data, such as data related to global economic factors, demographic changes, or changing customer tastes and preferences.

In summary, most organizations have three general decision-making levels: operational, managerial, and executive. Each level has unique activities and business processes, each requiring different types of information. In other words, it is common that each decision-making level is supported by different types of information systems.

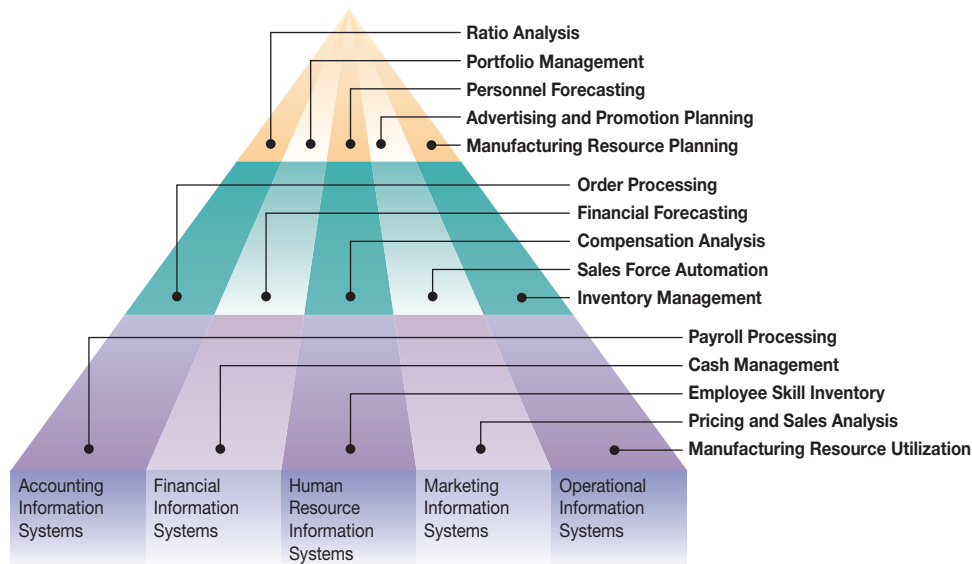
Organizational Functional Areas

In addition to different decision-making levels within an organization, there are also different functional areas. A functional area represents a discrete area of an organization that focuses on a specific set of activities. For example, people in the marketing function focus on the activities that promote the organization and its products in a way that attracts and retains customers; people in the accounting and finance functions focus on managing and controlling capital assets and

FIGURE 2.5

Information systems at the executive level of an organization help to improve strategy and planning by providing summaries of past data and projections of the future.



**FIGURE 2.6**

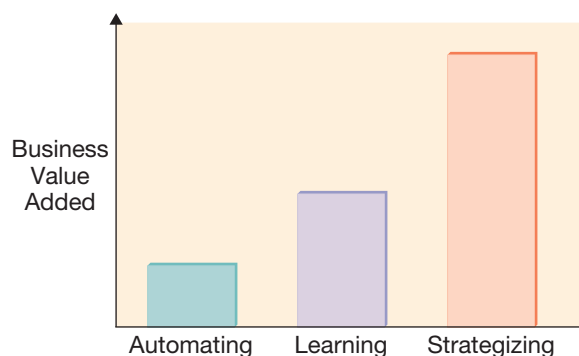
Business processes supported by various functional area information systems.

financial resources of the organization. Table 2.1 lists various organizational functions and lists examples of the types of information systems that are commonly used. These **functional area information systems** are designed to support the unique business processes of specific functional areas (Figure 2.6).

When deploying information systems across organizational levels and functions, there are three general ways the information system can provide value: to enable automating activities, to enable learning, and to enable the execution of organizational strategy (Figure 2.7). These three ways are not necessarily mutually exclusive, but we believe that each is progressively more useful to the firm and thus adds more value to the business. This is examined next.

Information Systems for Automating: Doing Things Faster

Someone with an **automating** perspective thinks of technology as a way to help complete a task within an organization faster, more cheaply, and perhaps with greater accuracy and/or consistency. Let us look at a typical example. A person with an automating mentality would take a loan application screening process and automate it by inputting the loan applications into a computer database so that those involved in decision making for the loans could process the applications faster, more easily, and with fewer errors. Such a system might also enable customers to complete the loan application online. A transition from a manual to an automated loan application process might enable the organization to deploy employees more efficiently, leading to even more cost savings (Table 2.2). Likewise, advances in Internet of Things technologies can help automate business process in various sectors; for example, the Industrial Internet of Things can tremendously improve the performance of companies in the manufacturing sector. Information systems at the operational level of an organization often help in automating repetitive activities,

**FIGURE 2.7**

The business value added from automating, learning, and strategizing with information systems.

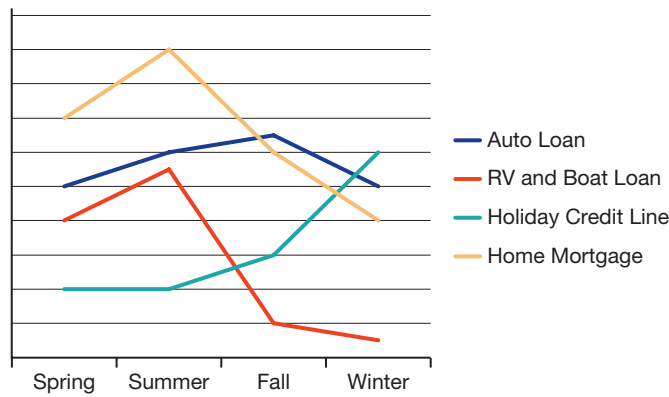
TABLE 2.1 Organizational Functions and Representative Information Systems

Functional Area	Information System	Sample Applications
Accounting and finance	Systems used for managing, controlling, and auditing the financial resources of the organization	<ul style="list-style-type: none"> ■ Accounts payable ■ Expense accounts ■ Cash management ■ Payroll processing
Human resources	Systems used for managing, controlling, and auditing the human resources of the organization	<ul style="list-style-type: none"> ■ Recruiting and hiring ■ Education and training ■ Benefits management ■ Employee termination ■ Workforce planning
Marketing	Systems used for managing new product development, distribution, pricing, promotional effectiveness, and sales forecasting of the products and services offered by the organization	<ul style="list-style-type: none"> ■ Market research and analysis ■ New product development ■ Promotion and advertising ■ Pricing and sales analysis ■ Product location analysis
Production and operations	Systems used for managing, controlling, and auditing the production and operations resources of the organization	<ul style="list-style-type: none"> ■ Inventory management ■ Cost and quality tracking ■ Materials and resource planning ■ Job costing ■ Resource utilization

TABLE 2.2 Activities Involved Under Three Different Loan Application Processes and the Average Time for Each Activity

Primary Activity	Manual Loan Process (Time)	Technology-Supported Process (Time)	Fully Automated Process (Time)
1. Complete and submit loan application	Customer takes the application home, completes it, and returns it (1.5 days)	Customer takes the application home, completes it, and returns it (1.5 days)	Customer fills out application from home via the web (15 minutes)
2. Check application for errors	Employee does this in batches (2.5 days)	Employee does this in batches (2.5 days)	Computer does this as it is being completed (1 second)
3. Input data from application into the information system	Applications are kept in paper form, although there is handling time involved (1 hour)	Employee does this in batches (2.5 days)	Done as part of the online application process (no extra time needed)
4. Assess loan applications under \$250,000 to determine whether to fund them	Employee does this completely by hand (15 days)	Employee does this with the help of the computer (1 hour)	Computer does this automatically (1 second)
5. Committee decides on any loan over \$250,000	(15 days)	(15 days)	(15 days)
6. Applicant notified	Employee generates letters manually in batches (1 week)	Employee generates letters with the help of a computer (1 day)	System notifies applicant via e-mail (1 second)
Total time	Anywhere from 25–40 days, depending on size of loan	Anywhere from 5–20 days, depending on size of loan	Anywhere from 15 minutes to 15 days, depending on size of loan

Note: Many online loan application services can now give you instant “tentative” approval pending verification of data you report in your online application. Also, only some of the activities within the manual and technology-supported processes can occur in parallel.

**FIGURE 2.8**

A computer-based loan processing system enables the bank manager to identify trends in loan applications.

but they can also help to gather valuable data for higher decision-making levels within the organization.

Information Systems for Organizational Learning: Doing Things Better

We can also use information systems to learn and improve. By analyzing data created when automating a process, improved understanding about the underlying work processes can be developed. The learning mentality builds on the automating mentality because it recognizes that information systems can be used as a vehicle for **organizational learning**—the ability of an organization to use past behavior and data to improve its business processes—and for change as well as for automation.

To illustrate a learning mentality, let us think again about our loan processing example. Figure 2.8 shows how a computer-based loan processing system can track types of loan applications by date, month, or season. The manager can easily see the trends and plan for the timely staffing and training of personnel in the loan department. The manager can also more efficiently manage the funds used to fulfill loans. This computer-based loan processing system, focusing on learning, is an example of an information system used at the managerial level of an organization.

A learning approach allows managers to track and learn about the types of applications filed by certain types of people at certain times of the year (e.g., more auto loan applications in the fall, mostly from men in their 20s and 30s), the patterns of the loan decisions made, or the subsequent performance of those loans. This new system creates data about the underlying business process that can be used to better monitor, control, and change that process. In other words, you *learn* from this information system about loan applications and approvals; as a result, you can do a better job at evaluating loan applications.

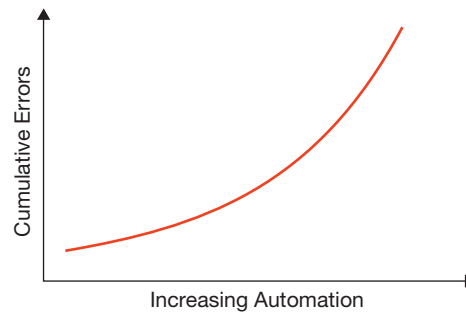
A combined automating and learning approach, in the long run, is more effective than an automating approach alone. If the underlying business process supported by technology is inherently flawed, a learning use of the technology might help you detect problems with the process and change it. For instance, in our loan processing example, a learning use of technology may help us uncover a pattern among the accepted loans that enables us to distinguish between low- and high-performing loans over their lives and subsequently to change the criteria for loan acceptance.

If, however, the underlying business process is bad and you are using technology only for automating (i.e., you would not uncover the data that would tell you this process is bad), you are more likely to continue with a flawed or less-than-optimal business process. In fact, such an automating use of technology may mask the process problems.

With a bad underlying set of loan acceptance criteria (e.g., rules that would allow you to approve a loan for someone who had a high level of debt as long as he or she had not been late on any payments recently), a person might manually review four applications in a day and, because of the problematic criteria used, inadvertently accept on average two “bad” applications per week. If you automated the same faulty process, with no learning aspects built in, the system might help a person review 12 applications per day, resulting in up to six “bad” applications accepted per week on average. The technology would serve only to magnify the existing

FIGURE 2.9

Automating a loan processing system requires sound underlying business processes, or errors will rapidly increase.



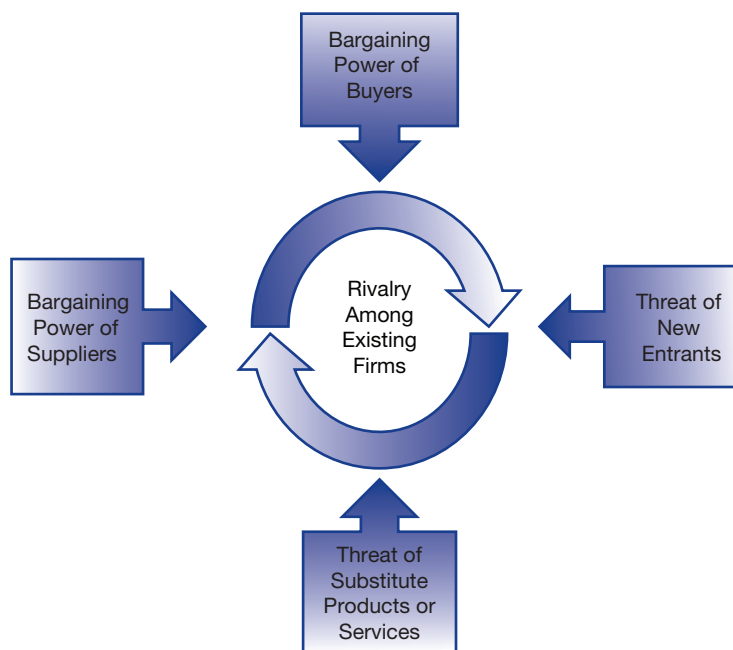
business problems (Figure 2.9). Without learning, it is more difficult to uncover bad business processes underlying the information system.

Information Systems for Supporting Strategy: Doing Things Smarter

Using information systems to automate or improve processes has advantages, as described previously. In most cases, however, the best way to use an information system is to support the organization's strategy. To understand why, think about **organizational strategy**—a firm's plan to accomplish its mission and goals as well as to gain or sustain competitive advantage over rivals—and how it relates to information systems. When senior managers—at the executive level of the organization—conduct **strategic planning**, they form a vision of where the organization needs to head, convert that vision into measurable objectives and performance targets, and craft a strategy to achieve the desired results. A person with a strategic mentality toward information systems goes beyond mere automating and learning and instead tries to find ways to use information systems to achieve the organization's chosen strategy, such as by innovating, streamlining operations, optimizing the supply chain, or better understanding customers. This person wants the benefits of automating and learning but also looks for some strategic, competitive advantage from the system. In fact, in today's business environment, if a proposed information system isn't going to clearly deliver some strategic value (i.e., help to improve the business so that it can compete better) while also helping people to work smarter and save money in the process, then it isn't likely to be funded. Returning to our loan example, a person with a strategic view of information systems would choose a computer-based loan application process because it can help achieve the organization's strategic plan to process loan applications faster and better than rivals and to improve the selection criteria for loans. This process and the supporting information system add value to the organization and match the organization's strategy. The system is, therefore, essential to the long-term survival of the organization. If, on the other hand, managers determine that the organization's strategy is to grow and generate new products and services, the computer-based loan application process and the underlying system might not be an efficient, effective use of resources, even though the system could provide automating and learning benefits.

Identifying Where to Compete: Analyzing Competitive Forces

Organizations struggle with identifying the best uses of their resources to execute their strategy. Whereas some companies have a competitive advantage by being the first to enter a market (i.e., having a **first-mover advantage**), most organizations have to compete within established industries. Given that every industry is different, organizations need to analyze the competitive forces within their industry to better understand where to focus their resources. One framework often used to analyze an industry is Porter's (1979) notion of the five primary competitive forces: (1) the rivalry among competing sellers in your industry, (2) the threat of potential new entrants into your industry, (3) the bargaining power that customers have within your industry, (4) the bargaining power that suppliers have within your industry, and (5) the potential for substitute products or services from other industries (Figure 2.10). Table 2.3 provides examples of how the Internet has influenced the various competitive forces in an industry. Porter's five-forces model of competition can help you determine which forces may be most important and which specific technologies could be used to address these forces. You can then use this knowledge as the basis for identifying particular investments.

**FIGURE 2.10**

Five forces influence the profit potential of an industry.

Identifying How to Compete: Choosing a Generic Strategy

In order to achieve superior returns, a company needs to position itself within the industry it operates in so as to be able to counter the effects of the five forces and gain a competitive advantage (Porter, 1985, 2001). In Figure 2.11, we show some common organizational strategies organizations use to position themselves within the industry. An organization might decide to pursue a **low-cost leadership strategy**, as does Walmart, by which it offers the best prices in its industry on its goods and/or services. Alternatively, an organization might decide to pursue a **differentiation strategy**, as do Porsche, Nordstrom, and IBM, by which it tries to provide better products or services than its competitors. A company might aim that differentiation broadly at many different types of consumers, or it might focus on a particular segment of consumers, as Apple did for many years with its focus on high-quality computers for home and educational markets. Still other organizations might pursue a middle-of-the-road strategy, following a **best-cost provider strategy**, offering products or services of reasonably good quality at competitive prices, as does Dell.

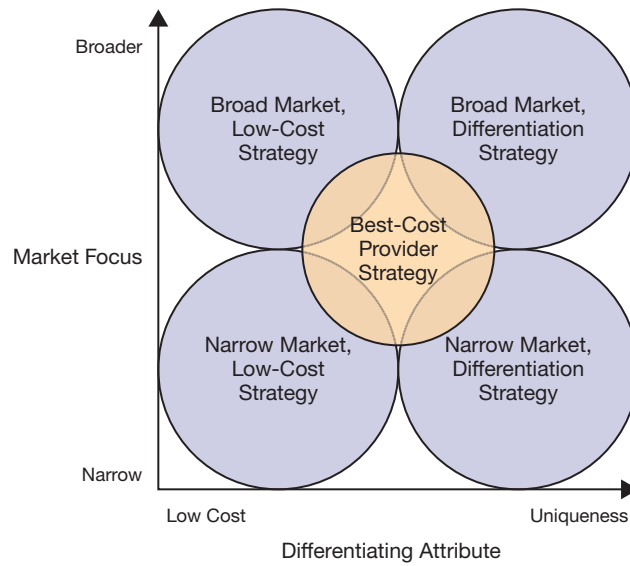
TABLE 2.3 The Influence of the Internet on the Competitive Forces

Competitive Force	Implication for Firm	Influence of the Internet
Traditional rivals within your industry	Competition in price, product distribution, and service	Increase of competitors due to wider geographic reach; customers can more easily compare products, so competition focuses more on price.
Threat of new entrants into your market	Increased capacity in the industry, reduced prices, and decreased market share	Reduced barriers to entry, as the Internet reduces the difficulty of obtaining critical resources or entering new markets.
Customers' bargaining power	Reduced prices, need for increased quality, and demand for more services	Wider choices for customers lead to lower switching costs and higher bargaining power of customers.
Suppliers' bargaining power	Increased costs and reduced quality	Companies have equal access to suppliers; easier to find new suppliers; suppliers have access to more potential buyers.
Threat of substitute products or services from other industries	Product returns from customers, decreased market share, and losing customers for life	New substitutes are created by the Internet and other information technologies.

Source: Based on *Corporate Information Strategy and Management*, 8e by Lynda Applegate, Robert Austin, F. Warren McFarlan, published by McGraw-Hill, 2008.

FIGURE 2.11

Five general types of organizational strategy: broad differentiation, focused differentiation, focused low-cost leadership, overall low-cost leadership, and best-cost provider.



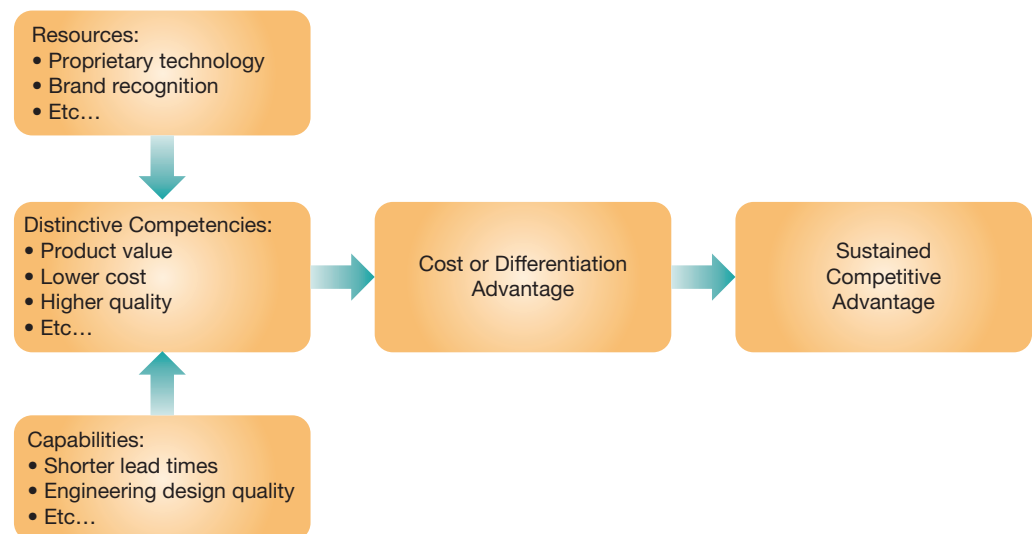
Identifying How to Compete: Resources and Capabilities

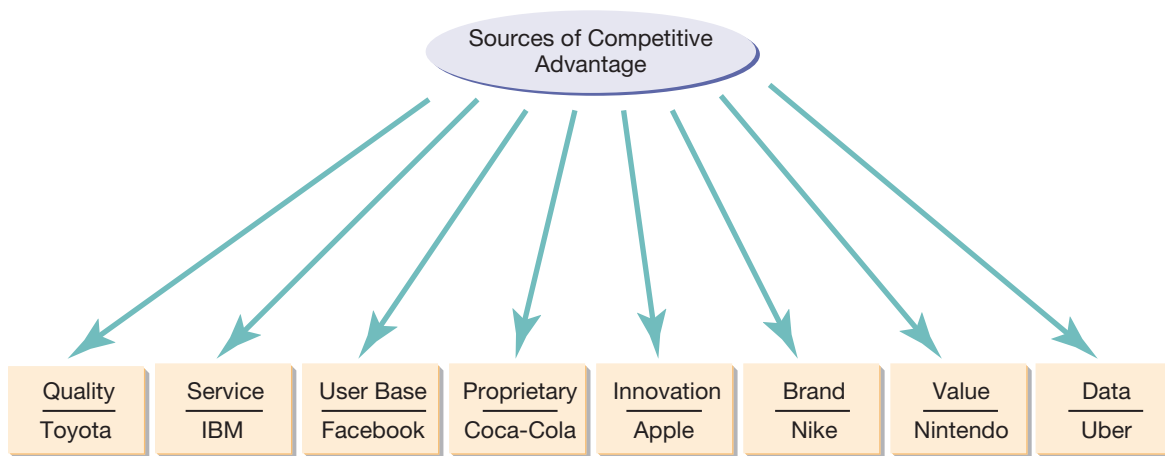
Choosing the right position not only helps a company attract customers but also helps focus investments in resources such as information systems and technologies to help gain a competitive advantage. In other words, no matter what generic strategy an organization chooses to pursue, it must have resources and/or capabilities that are superior to those of its competitors so as to gain or sustain a competitive advantage. **Resources** reflect the organization’s specific assets that are utilized to achieve cost or product differentiation from its competitors. Examples of resources might include proprietary technology, brand equity, or a loyal and established customer base. **Capabilities** reflect the organization’s ability to leverage these resources in the marketplace. For example, design quality or efficient operations could be capabilities that help a firm effectively utilize its resources. Together, the resources and capabilities provide the organization with **distinctive competencies**—such as innovation, agility, quality, or low cost—in the marketplace. These competencies help to pursue the organizational strategy (low-cost leadership, differentiation, etc.) and make the organization’s product valuable to its customers relative to its competitors; superior **value creation** occurs when an organization can provide products at a lower cost or with superior (differentiated) benefits to the customer (Figure 2.12). This is how organizations gain a competitive advantage. For many organizations, information systems are at the heart of the different resources, capabilities, or distinctive competencies. Figure 2.13 provides examples of resources, capabilities, and distinctive competencies used by companies to sustain competitive advantage.

FIGURE 2.12

Distinctive competencies lead to value creation and a sustained competitive advantage.

Source: Based on Competitive Advantage, published by Quick MBA.com.



**FIGURE 2.13**

Sources of competitive advantage.



GREEN IT

The Electric Navy

To effectively execute its mission, the U.S. Navy is constantly testing and developing new technology. On common feature of these new technologies is an increased thirst for electric power. With geopolitical instability threatening access to traditional fuels and environmental concerns ever increasing, the Navy is seeking newer, greener options for powering the next generation of ships.

Modern naval combat can be as much about technological prowess as it is about brute force. The U.S. Navy's new Zumwalt-class destroyers are intended to up the technological ante. Designed with stealth features, the ship has the radar cross-section of a small fishing boat. However, introducing state-of-the-art technologies also introduces new challenges. The ship's radar, sonar, and command and control systems draw tremendous amounts of power that on previous generations of ships would have had to come from generators. Next-generation weapons like rail guns, lasers, and particle weapons that are currently under development will increase the need for electric power even more. To help address this challenge, the USS Zumwalt, the first ship of the class, is the first Navy ship with a hybrid propulsion system. Just like a hybrid automobile, the ship has fuel-burning motors that power generators to fill storage batteries. Power from the batteries is then used to run both electric propulsion motors and the ship's systems. This arrangement allows for more efficient generation and flexible distribution of power between propulsion, sensors, and weapons systems.

Given the ever-increasing need for power and fuel, the Navy is also looking for alternatives to fossil fuels. Because technologies like nuclear power generation are too large and complex for smaller ships, the Navy is investigating biofuels as a greener, more available solution. In 2016, the Navy purchased 77 million gallons of biofuel made from beef fat to launch a fleet tour partially powered by green fuel. The fuel only constitutes 10 percent of the fleet's needs, however. The use of biofuels has also been criticized by politicians and environmentalists for not being particularly green—the amount of energy and petrochemicals that goes into growing the biomass used to produce the biofuel can be more than what would be used with traditional fossil fuels. Unfortunately, the use of renewable sources of power like solar and wind has its own challenges, such as requiring great leaps in energy storage technology. Until a better solution is found, the Navy will keep steaming ahead.

Based on:

Anonymous. (2016, February 16). Navy to launch carrier group powered partly by biofuels. *CBS8.com*. Retrieved May 29, 2016, from <http://www.cbs8.com/story/31016171/navy-to-launch-carrier-group-powered-partly-by-biofuels>

Biomass. (2016, May 20). In *Wikipedia, The Free Encyclopedia*. Retrieved May 29, 2016, from <https://en.wikipedia.org/w/index.php?title=Biomass&oldid=721248424>

Zumwalt-class destroyer. (2016, May 18). In *Wikipedia, The Free Encyclopedia*. Retrieved May 29, 2016, from https://en.wikipedia.org/w/index.php?title=Zumwalt-class_destroyer&oldid=720944689

Identifying How to Compete: Analyzing the Value Chain

Managers use value chain analysis to identify opportunities where information systems can be used to gain a competitive advantage (Porter, 1985, 2001; Shank & Govindarajan, 1993). Think of an organization as a big input/output process. At one end, supplies are purchased and brought into the organization. The organization integrates those supplies to create products and services that it markets, sells, and then distributes to customers. The organization also provides customer service after the sale of these products and services. Throughout this process, opportunities arise for employees to use information systems to add value to the product or service by acquiring supplies in a more effective manner, improving products, and selling more products. This set of activities that add value throughout the organization is known as the **value chain** within an organization.

Whereas the value chain model was initially created to focus on manufacturing, it can also be applied to service industries (sometimes with different activities being performed). For example, in a hotel, inbound logistics activities may include the receiving of supplies as well as handling reservations, and operations would include the day-to-day activities of checking guests in or out, cleaning rooms, preparing breakfast, and so on. Sales and marketing activities include promoting the hotel or attracting business meetings and conventions. Finally, customer service activities performed after the guest has left may include registering or resolving guest complaints. A typical hotel may, however, not perform any activities related to outbound logistics. Nevertheless, the supporting activities are likely to resemble those of other organizations. Other organizations may even lack both inbound and outbound logistics activities, and different activities may be classified differently. In the end, however, you should note that the value chain should serve as a tool to identify and analyze the different activities performed.

Value chain analysis is the process of analyzing an organization's activities to determine where value is added to products and/or services and what costs are incurred for doing so. In value chain analysis, you first draw the value chain for your organization by fleshing out each of the activities, functions, and processes where value is or should be added and where performance can be improved. Next, you determine the costs—and the factors that drive costs or cause them to fluctuate—within each of the areas in your value chain diagram. You then determine which activities need to be optimized so as to improve performance, cut costs, and ultimately gain or sustain competitive advantage.

The Role of Information Systems in Value Chain Analysis

Because information systems can automate and optimize many activities along the value chain, the use of information systems has become one of the primary ways that organizations improve their value chains. In Figure 2.14, we show a sample value chain and some ways that information systems can improve productivity within it. For example, many organizations use the

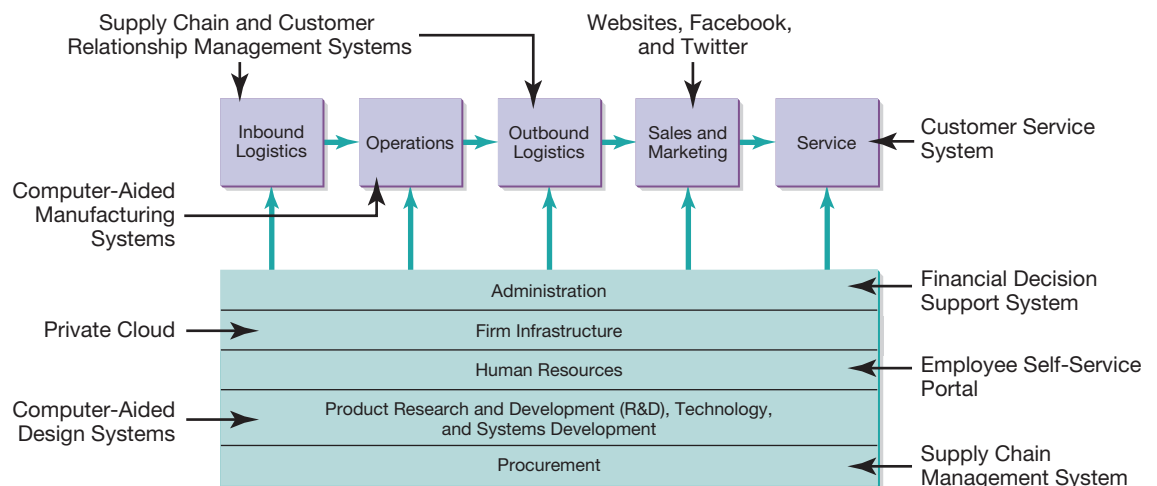


FIGURE 2.14

Information systems can improve an organization's value chain.

Internet to connect businesses with one another electronically so that they can exchange orders, invoices, and receipts online in real time. Likewise, organizations use various social media such as blogs, Twitter, or Facebook to connect with their customers.

The Technology/Strategy Fit

You might be asking, if any information system helps do things faster and better and helps save money, who cares whether it matches the company's strategy? Good question. If money grew on trees, you probably would build and use just about every information system you could imagine. Organizations could build or acquire many different valuable systems, but they are constrained by time and money to build or acquire only those that add the most value: those that help automate and learn as well as have strategic value. The old way for managers to think about information systems was that they were a necessary service, a necessary evil, and a necessary, distasteful expense that was to be minimized. Managers cannot afford to think this way anymore. Successful managers now think of information systems as a competitive asset to be nurtured and invested in and think of them as an enabler of opportunities and mechanism for supporting or executing their business model. In other words, organizations are trying to maximize **business/IT alignment**, and in most cases, they do not want systems that do not match the strategy, even if they offer automating and learning benefits. Further, while spending on information systems is rising, most companies are willing to spend money on projects only when they can see clear, significant value. Often, however, organizations have no choice in making some types of investments that may or may not coincide with their overall strategy. Such investments are called a **strategic necessity**—something the organization must do in order to survive.

Given this focus on the value that the system will add, an organization probably does not want a system that helps differentiate its products based on high quality when the organizational strategy is to be the overall industry low-cost leader. In other words, if a firm were pursuing a strategy for low-cost leadership, investments to help drive costs down would be valued over those that didn't. Throughout this book, we introduce various technologies, infrastructures, and services that can help to support an organization's competitive strategy.

We should also caution that merely choosing and implementing new or innovative information systems is not sufficient to gain or sustain competitive advantage. In any significant IS implementation, there must be commensurate, significant organizational change. This typically comes in the form of *business process management* and other similar methods of improving the functioning of the organization as opposed to merely dropping in an information system with no attempts at changing and improving the organization. We will talk more in Chapter 7, "Enhancing Business Processes Using Enterprise Information Systems," about the role of business process management for transforming organizational business processes. Further, an information system can be only as effective as the business model that it serves, and bad business models can't be overcome by good information systems. Next, we will discuss different business models in the digital world.

Business Models in the Digital World

We have examined how organizations can leverage technology investments to accomplish things faster, smarter, and more strategically. We also examined how to focus technology investments toward activities that provide competitive advantage and improve the performance of the organization's value chain. Taken together, organizations need to align their technology investments with their business model. A **business model** is a summary of a business's strategic direction that outlines how the objectives will be achieved; a business model specifies the **value proposition** as well as how a company will create, deliver, and capture value (Osterwalder & Pigneur, 2010) and identifies its customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partners, and cost structure. In other words, a business model reflects the following:

1. What does a company do?
2. How does a company uniquely do it?
3. In what way (or ways) does the company get paid for doing it?
4. What are the key resources and activities needed?
5. What are the costs involved?



WHO'S GOING MOBILE

Digital Nomads

The widespread availability of the Internet and the ever-increasing performance and capabilities of mobile technology have changed the way we work even while we're traveling. E-mail can be checked from the beach and documents edited from the airport. One side effect of these changes has been the opportunity to work in a location-independent way. If you can stay connected from wherever you are, why does it matter where you are when you work? This new approach has enabled the lifestyle of the "digital nomads." Digital nomads are people who live and work wherever they feel like, using the Internet and mobile technologies to connect with their customers or employers.

Popular locations for digital nomads share a few important criteria. The location must be an appealing place to live. As low cost of living and good weather are key drivers for many, digital nomads often choose places like Thailand, Indonesia, and Morocco. Those who seek more urban activities have located in cities like Bangkok, while beaches and resort towns are a draw for those looking to escape urban life. Next is good network connectivity. For digital nomads to be able to function effectively, they need to be able to connect to the Internet via Wi-Fi or cellular networks or otherwise in a reliable manner. Finally, community is important. The types of enterprises and business activities that are conducive to the digital nomad lifestyle often require collaboration. For example, entrepreneurial activities are more successful when you

have access to like-minded individuals to share and develop ideas.

While the digital nomad lifestyle may seem like a dream come true, there are many challenges. For a digital nomad, it can be hard to earn as much money as a traditional employee, even with the same skill set—nomads often are challenged to maintain the kinds of relationships with their customers and employers that lead to lucrative contracts and more interesting assignments. There can also be a degree of resentment when customers and employers see pictures of nomads working in a hammock on the beach—whether or not this affects the quality of their work.

To be a successful digital nomad, it is not enough to just live location free through technology. The job you do must be conducive to the work style, and the skills you need will be different from those of a traditional employee. More emphasis is placed on building and retaining networks in order to keep the pipeline of opportunities full. However, with the right skill set, the right opportunities, and some careful planning, a digital nomad lifestyle may be right for you.

Based on:

Altringer, B. (2015, December 22). Globetrotting digital nomads: The future of work or too good to be true? *Forbes*. Retrieved May 29, 2016, from <http://www.forbes.com/sites/forbesleadershipforum/2015/12/22/globetrotting-digital-nomads-the-future-of-work-or-too-good-to-be-true>

How a company answers these questions dictates how and where information systems investments can be utilized to execute a competitive strategy and sustain an advantage over competitors. There are several components of a proper business model (Table 2.4). Each component plays a critical role in shaping all aspects of the business, including such factors as the expenses, revenues, operating strategies, corporate structure, and sales and marketing procedures. Generally speaking, anything that has to do with the day-to-day functioning of the organization is part of its business model, and information systems can be utilized to support and execute many aspects of the business model.

Revenue Models in the Digital World

Perhaps the most important ingredient for any organization is determining how to generate revenue. A **revenue model** describes how the firm will earn revenue, generate profits, and produce a superior return on invested capital (even nonprofit organizations need a revenue model). In addition to sales, transaction fees, and advertising-based business models common in the offline world, the Internet has enabled or enhanced other revenue models, such as **affiliate marketing** (see Table 2.5). Many companies selling products or services (such as Amazon.com) use the web as an economic medium to reach a large customer base; large numbers of customers allow these companies to turn over their inventory quickly, thus enabling the company to offer low prices while still making a profit. Other companies (such as Netflix.com) generate revenue using a subscription model where customers pay a monthly or annual fee for using the product or service. In addition, the *freemium* model has become a popular way of providing digital products or services in the digital world. This is discussed next.

TABLE 2.4 Components of a Business Model

Component	Description	Questions to Ask
Customer segments	The customers targeted with the product/service offering	Who will be our target customers? Who are the most important customers?
Value proposition	The utility that the product/service has to offer to customers	Why do customers need our product/service? What problems will our product/service solve? Why would customers choose our product/service over our competitors' products/services?
Channels	The ways in which the product/service offerings reach the target customers	How will our customers be reached? Which channels are best in terms of cost and convenience for the customers?
Customer relationships	The relationships formed with the target customers	What types of relationships do we build with our customers (e.g., one-off vs. long-term)? How do we maintain these relationships?
Revenue streams	The way a firm generates income	How do we generate income? What are we selling? What are customers willing to pay for?
Key resources	The most important assets needed to make the business model work	What key resources are needed to enable our value proposition, channels, customer relationships, and revenue streams?
Key activities	The most important activities needed to make the business model work	What key activities are needed to enable our value proposition, channels, customer relationships, and revenue streams?
Key partners	The network of partners and suppliers needed to make the business model work	Who are our key partners and suppliers? What resources do they offer, and what activities do they perform?
Cost structure	The costs incurred when operating the business model	What are the costs incurred when operating the business model? Which resources and activities are most expensive?

Source: Based on *Business Model Generation* by Alexander Osterwalder, Yves Pigneur, published by Wiley, 2010.

TABLE 2.5 Typical Revenue Models in the Digital World

Revenue Type	Description	Who Is Doing This?
Affiliate marketing	Paying businesses that bring or refer customers to another business. Revenue sharing is typically used.	Amazon's Associates program
Advertising	Free services are provided to customers and paid for by a third party.	Yahoo!, Google, Facebook, Twitter
Subscription	Users pay a monthly or yearly recurring fee for the use of the product/service.	Netflix, World of Warcraft, Spotify
Licensing	Users pay a fee for using protected intellectual property (e.g., software).	Symantec, Norton
Transaction fees/Brokerage	A commission is paid to the business for aiding in the transaction.	PayPal, eBay, Groupon, Scottrade, Airbnb, Uber
Traditional sales	A consumer buys a product/service from the website.	Amazon, Zappos, Nordstrom.com, iTunes
Freemium	Basic services are offered for free, but a premium is charged for special features.	Flickr, Skype, Dropbox.com

FREEMIUM. According to basic economics within a competitive marketplace, the price of something is set by its marginal cost—the cost of producing an additional unit of output. In recent years, the prices of computer processing, storage, and bandwidth—the fundamental building blocks for providing digital products or services—have been in a free fall, and cloud computing has turned many of these costs into variable costs. As the marginal costs of providing digital products or services continues to decrease, organizations are able to use a **freemium** (“free” + “premium”) approach; using a freemium approach, an organization gives away limited versions of a product or service for free in order to build a large customer base and charges a premium for unrestricted versions (typically on a subscription basis). For example, the online photo-sharing application Flickr (owned by Yahoo!) allows users to store, share, organize, and tag a limited number of pictures for free, and users can upgrade to a paid “pro account,” providing additional features, such as unlimited storage and advertisement-free browsing. Likewise, the cloud storage provider Dropbox offers free accounts with limited storage capacity and allows users to subscribe to accounts with larger storage space. Depending on the product or service offered, the restrictions of free versions can include limitations of features, bandwidth, storage, or number of users, or the product or service can be restricted to a certain class of users, such as educational users (see Figure 2.15).

Internet startups and app developers alike benefit from the ability to scale up quickly under the freemium approach; further, companies benefit from the paying subscribers as well as the free users, many of whom are likely to refer the product or service to their friends. However, a company choosing to use a freemium model has to carefully choose which features to offer for free. On the one hand, the free offerings have to be compelling enough to attract new users; on the other hand, if too many features are offered in the free versions, few people will be willing to pay for the more feature-rich versions. Often, a process of fine tuning and adjustments is needed to strike this balance; this is especially difficult if it involves reducing service levels of the free offering (as was the case when Microsoft reduced the free storage space of its OneDrive service from 15GB to 5GB in 2016).

The freemium business model has become extremely popular with mobile apps and, in particular, games. Mobile games such as Candy Crush Saga or Clash of Clans are free to download but offer players the option to make **in-app purchases**, allowing them to purchase access to extra features, content, or in-game currency. This allows the games to quickly build a huge user base in addition to generating continuous revenue streams. For example, in 2015, the free

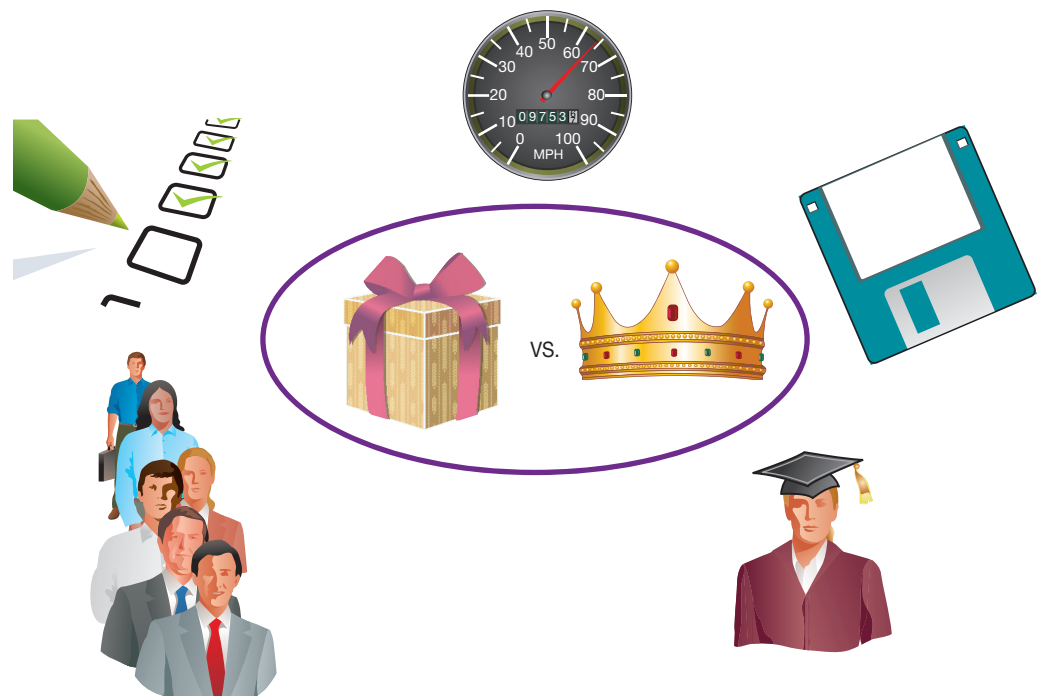


FIGURE 2.15

Under the freemium approach, typical restrictions of free versions include limitations of features, bandwidth, storage, type of user, or number of users.



WHEN THINGS GO WRONG

The Pains of Uber in China

Using a combination of social, mobile, and Big Data, the car hailing service Uber has built a successful business in many locations around the world by disrupting the local transportation industry. Entrenched, protected taxi monopolies have a hard time reacting and competing. What happens when the local transportation industry is willing to be just as disruptive? Many locales have attempted to protect their existing taxi systems legislatively or through the courts—Uber has been sued countless times. In China a competitor has taken a different tact—“out-disrupt” Uber.

Didi Kuaidi was formed by the merger of rival taxi-hailing services from Alibaba and Tencent—two of China’s Internet giants. The service competed directly with Uber in the private car ride-sharing market but also went much further. Later renamed Didi Chuxing, the service let users select between a taxi, private car, shared car, shuttle van, or even bus. This gave Didi Chuxing enormous reach and market potential. In 2015, it arranged more than 1.4 billion rides—more than Uber has done worldwide since it was founded in 2009. In China’s private car ride-sharing market, it was estimated that Uber had captured about a third while Didi Chuxing had the entire remaining two-thirds. However, as Uber first launched in China in 2014 and as of early 2016 only operated in the country’s four largest cities, the question remained as to whether Uber would be able to recapture market share from Didi Chuxing as it expanded throughout the country.

At the same time, Didi Chuxing was not just sitting still and waiting for Uber to catch up. In addition to transportation services, Didi Chuxing planned to take advantage of the information it collected about users and usage, and even planned to start offering car loans to drivers and potentially even passengers. Further, Didi Chuxing let passengers book test drives of

new cars from a variety of manufacturers—nearly 1.4 million test drives had taken place in less than a year. Lastly, Didi Chuxing was exploring the matchmaking business. The service let drivers and passengers select each other based on shared interests; started in partnership with LinkedIn, it allowed people to join their accounts across the two networks. Didi Chuxing has also invested in and forged partnerships with Uber’s rivals in other markets like India and the United States. While Uber has been successful by following a strategy to disrupt traditional markets and power structures and to compete ruthlessly, it learned—as companies from Amazon to Google did before—that the regulatory environment in China often tends to favor local businesses. Facing an increasingly hostile regulatory environment, Uber was unable to compete with the powerful state-backed rival, and in mid-2016, decided to withdraw from the Chinese market, selling all its assets to its Chinese competitor in return for a minority stake in the company.

Based on:

Anonymous. (2016, January 30). More than mobility. *The Economist*. Retrieved May 29, 2016, from <http://www.economist.com/news/business-and-finance/21689487-companys-ambitions-go-far-beyond-taxi-hailing-didi-kuaidi-dominating-uber-chinas>

Kirby, W. C. (2016, August 2). The real reason Uber is giving up in China. *Harvard Business Review*. Retrieved August 9, 2016, from <https://hbr.org/2016/08/the-real-reason-uber-is-giving-up-in-china>

Naughton, J. (2016, August 7). Why Uber has been taken for a ride in China. *The Guardian*. Retrieved August 8, 2016, from <https://www.theguardian.com/commentisfree/2016/aug/07/uber-china-free-trade-brexit>

Uber (company). (2016, May 28). In *Wikipedia, The Free Encyclopedia*. Retrieved May 29, 2016, from [https://en.wikipedia.org/w/index.php?title=Uber_\(company\)&oldid=722506162](https://en.wikipedia.org/w/index.php?title=Uber_(company)&oldid=722506162)

game Clash of Clans raked in more than US\$1.3 billion, merely through in-app purchases. This, in turn, is beneficial for the players as well, as the game’s developers depend on the revenue stream and are therefore incentivized to continuously update and upgrade the game experience.

Platform-Based Business Models and the Sharing Economy

Traditionally, many business models functioned like pipes, where products were produced and pushed to the customers (Choudary, 2013). The advent of the Internet, together with the megatrends mobile, social, and cloud computing, has enabled new business models, which are built around the concept of a platform. Rather than providing a product or service, a digital **platform** enables others—both other businesses and users—to co-create value (see Table 2.6). In essence, these business models are creating digital ecosystems where some users create value and other users consume. For example, users uploading content to Flickr or Wikipedia are producers of value that is consumed by others. Likewise, Uber and Airbnb are successful platforms that do not offer services themselves but depend on users to offer and consume services. As a result, the success of a platform is dependent on the network effect, and a platform only has value if users participate in the production or consumption; thus, any platform-based business model has to be

TABLE 2.6 Examples of Platform-Based Business Models

Value Created/Exchanged	Examples
Products	Amazon Marketplace, eBay
Services	Airbnb, Uber
Payments	Square, PayPal
Investments and funding	Kickstarter, Lending Club
Content	Wikipedia, Twitter, YouTube
Communication	WhatsApp, Skype
Collaboration	Dropbox
Social relationships	Facebook, LinkedIn

Source: Based on *What is a Platform?* by Alex Moazed, May 1, 2016, <http://www.applicoinc.com/blog/what-is-a-platform-business-model/>. Published by APPLICO INC.

attractive to both producers and consumers. Whereas platforms tend to be attractive as they often have negligible (or zero) marginal costs, they carefully have to think about how to monetize their services. For instance, Airbnb uses a transaction fee–based revenue model (charging both parties), whereas YouTube charges neither the producers nor the consumers but a third party (advertisers). Today, many pipe-based businesses include platform elements, such as reviews created by users. As we move further into the digital future, every business has to consider in how far its business model will include platform elements and how these will influence its business strategy.

Many of these platforms match producers and consumers directly without the need for traditional middlemen, a concept referred to as *disintermediation* (see Chapter 4, “Enabling Business-to-Consumer Electronic Commerce”). As increasingly, individuals are sharing not only content (such as opinions or media) but physical goods or services on dedicated platforms, many believe that we are moving toward a sharing economy. A **sharing economy** (sometimes referred to as **collaborative economy**) has been defined as “an economic system in which assets or services are shared between private individuals, either free or for a fee, typically by means of the Internet” (Oxford Dictionary, 2016). As ownership is shared, assets can often be used more effectively. For example, increasing population density makes individual car ownership increasingly infeasible but enables efficient car sharing. At the same time, shared ownership, facilitated by technological platforms, can help to utilize the car during (otherwise) idle times. In other words, it is not ownership that counts but being able to access the asset or resource. While initially, the concept of a sharing economy included social goals, such as waste reduction or increasing human interaction, this is now of lesser importance. Yet many companies within the sharing economy contribute to achieving greater social welfare. For example, research has shown that a vehicle used by a car-sharing platform such as car2go (a subsidiary of German automaker Daimler) can replace up to 13 privately owned vehicles, and for some, Uber replaces the need for owning a vehicle (see Figure 2.16). Likewise, platforms such as Craigslist or eBay encourage the selling of used goods, extending the usable life of many products.

Platform-based business models and the sharing economy are touted as offering many promises. In addition to benefits such as reduced car ownership or the reuse of otherwise-discarded goods, often-cited benefits include increasingly flexible work arrangements or people’s ability to earn extra income by renting out their apartments to strangers using Airbnb or working as drivers for Uber. These business models, however, are not without criticism. For example, whereas the business models used by Uber or Airbnb disrupt traditional business models, often promising greater choices for end customers, they do so at a cost for humans and society. In this “**gig economy**,” workers are not employed by the company, but are only hired for short-term, temporary jobs. In many cases, worker’s rights—which people have fought for since the industrial revolution—are neglected, with workers having no protection against discrimination, no social security, little job security, and so on; likewise, income opportunities as well as social interactions

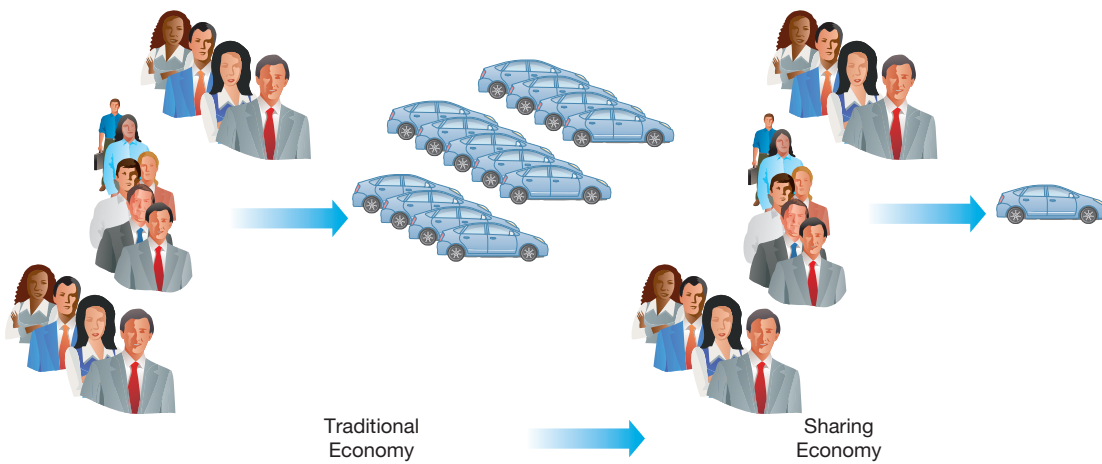


FIGURE 2.16

In the sharing economy, shared ownership reduces the need for individual ownership of cars and other goods.

with coworkers are often severely limited. Further, in their endeavor to disrupt traditional business models (such as hotels or limousine services), companies such as Uber and Airbnb try to gain a competitive advantage over traditional businesses by breaking (or at least bypassing) existing laws and regulations. While arguably, laws and regulations will (have to) adapt to new technologies in the short or long term, such behavior can often be regarded as unfair competition.

Service-Based Business Models

The Internet of Things, the rise in mobile devices, Big Data, and cloud computing have enabled another type of business models, centered around not selling products but providing these as services (sometimes referred to as **XaaS**, or “X as a service”). Many traditional manufacturers use pipe-based business models to produce goods which are then sold to the end users. Under a service-based business model, a manufacturer can offer equipment services, such as offering the product itself as a service or offering operations and optimization services, or information services, such as selling data or insights generated by the customer’s usage of the product (see Figure 2.17). For example, manufacturers of jet engines, such as Rolls-Royce or GE, traditionally would sell engines to the owners of aircraft (such as airlines); however, as the bargaining power of buyers is high in the industry, the market for new engines is competitive, so much of the manufacturers’ revenue typically comes from performing maintenance and selling spare parts. Under a service-based business model, in contrast, a manufacturer such as GE is being paid for guaranteeing continuous uptime, essentially

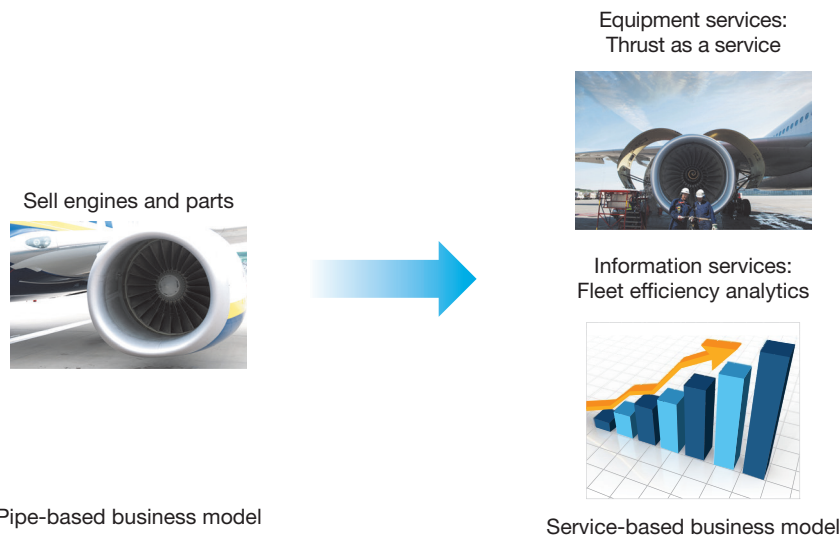


FIGURE 2.17

Under a service-based business model, a manufacturer can offer equipment services or information services.

Source: SergioBoccardo/Shutterstock; Christian42/Fotolia.

providing “thrust as a service.” The customer thus does not have to purchase the engine or spare parts but pays for hours of usage, transforming fixed costs into variable costs; the engine manufacturer only earns money for operating engines and thus has an incentive to improve the engine’s design and perform preventive maintenance. Obviously, such business models are only possible through rapid advances in Internet of Things technology; using a multitude of sensors integrated throughout the engines and connected to the Internet, GE can continuously monitor and analyze engine performance and use advanced analytics to predict potential engine failure and better schedule maintenance events. Similarly, Philips provides lighting as a service for 25 parking garages of the Washington Metropolitan Area Transit Authority; the transit authority needs no upfront capital for the lighting, and Philips installs and maintains the lighting and earns revenue through continuous energy-cost savings. These business models, however, require new thinking by the players involved. First of all, rather than focusing on minimizing manufacturing costs so as to increase profit margins, the manufacturers have to focus on life span and ease of maintenance/repair. Likewise, in order to maximize revenues, the manufacturers have to be able to monitor performance, predict outages, and schedule



ETHICAL DILEMMA

The Ethics of the Sharing Economy

The sharing economy is taking off. Two standouts have been Uber and Airbnb. Uber is a service that connects people in need of rides with drivers willing to give one. As of early 2016, Uber was available in more than 60 countries and 400 cities worldwide. Airbnb is a service that connects people looking for a place to stay with people who have a room or a house available to rent. As of early 2016, Airbnb had more than 1.5 million listings in 34,000 cities in 190 countries. As with any successful new business, many people are looking to duplicate successful business models and try to understand the secrets of success. Since both Uber and Airbnb have thrived on disrupting existing markets that are heavily regulated (i.e., taxi services and hotels), the question that comes to many people’s mind is: Are Uber and Airbnb breaking any laws or regulations to drive their success?

Taxi services are heavily regulated. To provide for rider safety, drivers must undergo extensive screening and background checks, and vehicles are regularly inspected. In addition, to control markets and limit the number of taxis in the street, the economics of taxi systems are often regulated at the city level. A medallion (taxi permit) is required to provide taxi services, and there are a limited number of them available. To own a medallion, a driver (or taxi company) must comply with all of the regulations and pay an often-substantial fee. To drive for Uber, no such fees or inspections are required—though the service has added background checks in certain jurisdictions. Likewise, hotels and other forms of lodging are regulated as well. In addition to the properties themselves being regulated for safety and security, many jurisdictions are interested in maintaining consistency in their zoning laws and ensuring the proper collection of tax revenue. Those renting out their apartment or house via Airbnb are not affected (or ignore) such regulations; further, as Airbnb hosts typically do not collect lodging (or occupancy)

taxes from the guests, municipalities typically lose out on considerable tax revenues. Another criticism is the reduction of long-term housing associated with the unregulated renting of properties in residential neighborhoods.

Both Uber and Airbnb would argue that they are simply removing transactional friction from markets for services that are already permissible under existing laws. Others argue that Uber and Airbnb are simply shifting costs to others involved in the value chain for these services, such as drivers and homeowners. The challenge remains that the existing laws and regulatory frameworks provide for and protect existing economic stakeholders and interests. Whether new sharing economy entities like Uber and Airbnb are playing fair or not, these stakeholders will not take such challenges lying down. Expect more challenges and highly public disputes to come.

Questions

1. Should services like Uber and Airbnb have to follow the same rules and regulations as a taxi company or hotel? Why or why not? Explain.
2. Imagine creating a platform for individuals to connect and sell meals out of their home or apartment to paying customers in a way similar to Uber. What concerns could this raise?

Based on:

Airbnb. (2016, May 22). In *Wikipedia, The Free Encyclopedia*. Retrieved May 29, 2016, from <https://en.wikipedia.org/w/index.php?title=Airbnb&oldid=721592341>

Millard, D. (2015, February 11). The sharing economy is not your friend. *Vice*. Retrieved May 29, 2016, from <http://www.vice.com/read/the-case-against-airbnb-and-uber>

Uber (company). (2016, May 28). In *Wikipedia, The Free Encyclopedia*. Retrieved May 29, 2016, from [https://en.wikipedia.org/w/index.php?title=Uber_\(company\)&oldid=722506162](https://en.wikipedia.org/w/index.php?title=Uber_(company)&oldid=722506162)

maintenance; all of this would not be possible without sensors connected to the Internet that provide continuous data streams and advanced Big Data analytics.

Making the transition from a product-oriented toward a service-based business model, however, is not without challenges. For example, whereas selling a product typically involves negotiating price and features, selling services involves not only developing new pricing models and implementing new business processes but also negotiating service level agreements with the customers (see Chapter 3, “Managing the Information Systems Infrastructure and Services”). Likewise, managing inventories and capacities is more challenging due to fluctuations in demand for services. Finally, the targeted customer segment for products is often different from that for services, which necessitates changes to marketing and communication with customers.

Valuing Innovations

Innovation is key for organizations attempting to gain or sustain a competitive advantage, be it through cost or differentiation. Companies that are leaders in their respective markets or have strong brands often tend to find it difficult to react appropriately to new trends, and Cisco’s former CEO John Chambers predicted that almost half of today’s leading businesses might not see the next decade (EY, 2016a). For organizations, **innovation** involves creating new products, processes, or services that return value to the organization (note that in contrast to merely inventing new products, services, or processes, innovation involves *realizing* the value). The most common form of innovation is incremental innovation, which involves enhancing or upgrading existing products, services, or processes. In contrast, **radical innovations** (sometimes called **disruptive innovations**) use a markedly new or different technology to access new customer segments and/or provide significantly greater benefits to existing customers and eventually marginalize or replace existing products or services (Chandy & Tellis, 1998) (see Table 2.7). When hearing *innovation*, people often only think about innovative products or services. Innovative products or services (even radical innovations), however, can easily be copied, and only focusing on these can be a dangerous path; in fact, many leading companies, ranging from Apple to Dyson, all too frequently have to engage in lawsuits to protect their innovations from copycats. Successful organizations thus go beyond product and service innovation and introduce other innovations such as new ways of earning revenue or entirely new business models. In their book *Ten Types of Innovation*, Keeley et al. (2013) outline how different types of innovations can help organizations gain or sustain competitive advantage (see Table 2.8).

Given that product performance innovations can often be easily copied, companies often combine multiple types of innovations to sustain competitive advantage. For example, Apple is typically known for its product innovations; yet, while the design and functionality of Apple’s innovative products have been widely imitated, other companies find it difficult to copy Apple’s product system innovations or customer engagement innovations. Likewise, computer manufacturer Dell combined profit model innovations (collecting money before building the product), process innovations (the built-to-order model), and channel innovations (selling computers online rather than in stores) as well as other types of innovation to challenge established computer manufacturers.

Most (if not all) of these innovations are enabled by or would not even be possible without information systems. For example, platform-based business models, such as used by Airbnb, would not be possible without the Internet; likewise, Uber’s business model could not exist without mobile devices used by riders and drivers, and Uber would not be able to implement its dynamic pricing feature (called “surge pricing”) without real-time analysis and prediction of traffic conditions and demand for services. For companies manufacturing physical products, process innovations enabled by robotics and the Industrial Internet of Things offer tremendous improvements in efficiency, product quality, agility, and flexibility, allowing companies to mass-produce customized products (see Chapter 4). Thus, an organization often must deploy new, state-of-the-art technologies to gain or sustain a competitive advantage. Although firms can choose to continually upgrade older systems rather than investing in new systems, these improvements can often at best give only a short-lived competitive edge.

To gain and sustain significant competitive advantage, firms must often deploy the latest technologies or redeploy and reinvest in existing technologies in clever, new ways. For example, architects and interior designers use **virtual reality (VR) headsets**—head-mounted devices

TABLE 2.7 Examples of Radical Innovations and Their Associated Displaced or Marginalized Technology

Radical Innovation	Displaced or Marginalized Technology
Digital photography	Chemical photography
Desktop publishing	Traditional publishing
Online stock brokerage	Full-service stock brokerage
Online retailing	Brick-and-mortar retailing
Free, downloadable greeting cards	Printed greeting cards
Distance education	Classroom education
Unmanned aircraft	Manned aircraft
Nurse practitioners	Medical doctors
Semiconductors	Vacuum tubes
Automobiles	Horses
Airplanes	Trains
Compact discs	Cassettes and records
MP3 players, music downloading, streaming	Compact discs and music stores
Smartphones	MP3 players, dedicated GPS navigation
Mobile telephony	Wire-line telephony
Tablets	Notebook computers
Xbox, PlayStation, smartphones	Desktop computers
3D printing	CNC milling
Camera drones	Helicopters for aerial filming/photography

enabling immersive three-dimensional experiences—such as Oculus Rift to allow customers to virtually explore planned buildings or offices before construction has started; likewise, Marriott used the Oculus Rift headset to “teleport” users to vacation destinations, and the tourism board of British Columbia produced 360-degree tours of the province. Virtual reality headsets are quickly becoming mainstream, with companies such as Samsung offering virtual reality cameras that allow capturing 360-degree videos that can be edited and viewed using Samsung’s own “Gear 360” virtual reality headset. Similar to virtual reality, **augmented reality** uses information systems to enhance a person’s perception of reality by providing relevant information about the user’s surroundings; typically, special glasses or other devices are used to augment the user’s view of the real-world environment with computer-generated content. An early application of augmented reality was Google Glass, eyeglasses with a tiny embedded screen, which augmented reality by displaying information about the wearer’s surroundings, including weather information, public transportation schedules, reviews about a restaurant the wearer is looking at, and other useful information. Microsoft’s HoloLens takes this concept a step further by enabling mixed reality, where the user’s view of the real-world environment is augmented with 3D holographic content. While as of 2016, Google Glass was on hold, Microsoft’s HoloLens was shipped to developers. No matter which products will eventually succeed in the marketplace, exciting new technologies are on the horizon.

But with the plethora of new information technologies and systems available, how can you possibly choose winners? Indeed, how can you even keep track of all the new breakthroughs,

TABLE 2.8 Ten Types of Innovation

Innovation	Description	Examples
Profit model innovation	Finding novel ways of generating revenues from offerings	Dropbox using a freemium approach; Microsoft offering Office 365 on a subscription basis; GE selling “thrust as a service”
Network innovation	Harnessing the capabilities and strengths of others	GlaxoSmithKline or Marriott using open innovation for new product or service ideas; Netflix running contests for improving movie recommendation algorithm; luxury hotels partnering with fashion designers
Structure innovations	Using the company’s talent and assets in innovative ways	Southwest Airlines focusing on one aircraft type; Google allowing employees to use of 20 percent of their time for own projects
Process innovations	Changing primary processes used to produce product or service	Toyota pioneering lean production; Zara moving fashion from initial design to stores in 3 weeks
Product performance innovations	Creating novel products or improving existing products through differentiation	Dyson’s Airblade hand dryers; Corning’s “unbreakable” Gorilla Glass; Coke’s customizable Coke bottles
Product system innovations	Creating bundles of complementary offerings	Microsoft bundling individual office programs into Office suite; Apple offering developer tools and app store to enable developers to create novel apps; Marriott letting users test drive GoPro HERO action cams
Service innovations	Supporting and enhancing value of offering	Zappos’s WOW philosophy of delivering excellent customer service; Men’s Wearhouse offering its customers to purchase free lifetime pressing
Channel innovations	Using innovative ways to connect offerings with customers	Niketown offering immersive experiences; Nespresso partnering with hotels and airlines
Brand innovations	Positioning the brand in innovative ways	Virgin family of brands; German discount grocer Aldi’s Trader Joe’s markets
Customer engagement innovations	Developing meaningful connections with customers	Swarm encouraging users to frequently “check in” to places; Apple tying customers to its ecosystem

Source: Based on *Ten Types of Innovation: The Discipline of Building Breakthroughs* by Larry Keeley, Helen Walters, Ryan Pikkell, Brian Quinn, published by John Wiley & Sons, 2013.

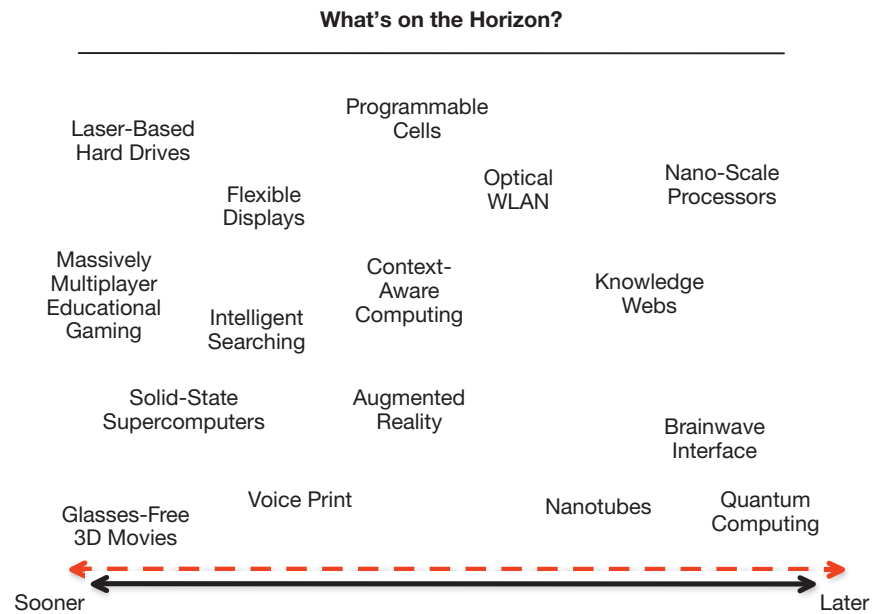
new products, new versions, and new ways of using technologies? For example, in Figure 2.18 we present a small subset of some new information technologies and systems, ranging from some that are here now and currently being used to some that are easily a decade away from being a reality. Which one is important for you? Which one will make or break your business? Does this list even include the ones that you need to be concerned about?

The Need for Constant IS Innovation

Sir John Maddox, a physicist and the editor of the influential scientific journal *Nature* for 22 years, was quoted in *Scientific American* in 1999 as saying, “The most important discoveries of the next 50 years are likely to be ones of which we cannot now even conceive.” Think about that for a moment. Most of the important discoveries of the next 50 years are likely to be things that, at present, we have no clue about. To illustrate that point, think back to the state of the Internet back in 1999. Then the Internet was not on the radar screens of many business organizations. Those that had websites were mostly providing an electronic brochure to customers and weren’t exploiting the technology to streamline business processes as is the norm today. Look now at how the Internet has transformed modern business. How could something so transformational not have been easier for businesses to imagine or predict a decade earlier? It is difficult to see these things coming. Next, we examine how you can improve your ability to spot and exploit new innovations.

FIGURE 2.18

Some enabling technologies on the horizon.



Successful Innovation Is Difficult

As we hinted at previously, there are limits to using emerging information systems to innovate and gain or sustain a competitive advantage. Information systems are often bought from or built by someone else. They are often either purchased from a vendor or developed by a consultant or outsourcing partner. In these situations, the information systems are usually not proprietary technologies owned by the organization. For example, although a soft-drink company can patent the formula of a cola or a pharmaceutical company can patent a new drug, an organization typically cannot patent its use of an information system, particularly if someone else developed it. The data in the system may be proprietary, but the information system typically is not.

INNOVATION IS OFTEN FLEETING. Given the pace of change in the digital world, advantages gained by innovations often have a limited life span. For example, even in situations where an organization has developed an innovative information system in-house, it usually did so with hardware, software, and networking components that others can also purchase. In other words, rivals can copy innovative information systems, so this form of competitive advantage can be short-lived. Indeed, if use of the new system causes one organization to gain a significant advantage over others, smart rivals are quick to duplicate or improve on that use of the system. Likewise, rivals can copy innovative products, services, or processes. One classic counterexample, however, is Amazon.com's patented "one-click" ordering process that has been successfully defended in the courts.

INNOVATION IS OFTEN RISKY. Choosing among innovative IS-related investments or potential product, service, or process innovations always entails risk. The classic example from consumer electronics is the choice of a videocassette recorder (VCR) in the early days of that technology and the competing Betamax (developed by Sony) and VHS (developed by JVC) formats. Most experts agreed that the Betamax had superior recording and playback quality, but VHS ultimately won the battle in the marketplace. People who made the "smart" choice at the time probably would have chosen a VCR with the Betamax format. Ultimately, however, that turned out to be an unfortunate choice. Recently, consumers again had to choose between two competing formats, namely, for high-definition (HD) DVD players, where the Blu-ray and HD DVD formats competed to become the industry standard. In this battle, Microsoft, Toshiba, and many others backed the HD DVD format, while Sony led the fight for Blu-ray (and even incorporated it into its PlayStation 3 gaming console). This time around, Sony (and the Blu-ray format) won the "format war," with the dissolution of the HD DVD Promotion Group in early 2008, effectively making Blu-ray the dominant format for HD video discs (Figure 2.19). Choosing among innovative IS-related investments is just as risky as choosing consumer electronics. In fact, for organizations, choosing among the plethora of available innovative technologies is far

**FIGURE 2.19**

Blu-ray has become the industry standard for high-definition DVD players.

Source: Matthew Jacques/Shutterstock.

riskier, given the size and often mission-critical nature of the investment. Choosing a suboptimal DVD player, although disappointing, is usually not devastating.

INNOVATION CHOICES ARE OFTEN DIFFICULT. Choosing new technologies in the IS area to develop innovative products, services, or processes is like trying to hit one of several equally attractive fast-moving targets. You can find examples of the difficulty of forecasting emerging technologies in the experiences that many organizations have had in forecasting the growth, use, and importance of the Internet. The 1994 Technology Forecast prepared by the major consulting firm Price Waterhouse (now PwC) mentioned the word *Internet* on only five pages of the 750-page document. The next year, more than 75 pages addressed the Internet. Only 3 years later, in the 1997 briefing, the Internet was a pervasive topic throughout. Back in 1994, it would have been difficult, perhaps even foolish, to forecast such pervasive, rapidly growing business use of the Internet today. Table 2.9 illustrates how many people and organizations have had difficulty making technology-related predictions.

Given the pace of research and development in the IS and components area, staying current has been nearly impossible. Probably one of the most famous metrics of computer evolution has been “Moore’s law.” Intel founder Gordon Moore predicted that the number of transistors that could be squeezed onto a silicon chip would double every 24 months (this number is now often reduced to 18 months), and this prediction has proven itself over the past 40 years (see Chapter 3). In fact, some computer hardware and software firms roll out new versions of their products every 3 months. Keeping up with this pace of change can be difficult for any organization.

Open Innovation

Given the difficulties associated with innovation, organizations increasingly realize that potential for innovation often exists outside of their boundaries and try to harness the creativity of external stakeholders. **Open innovation**, or the process of integrating external stakeholders into the innovation process, can thus prove very beneficial. For example, pharmaceutical giant Eli Lilly created a site called InnoCentive, where companies can post scientific problems and everybody can take a shot at solving the problem. Usually, a reward is paid to a successful solver. This way, an ad hoc research-and-development network is created, and companies have to rely less on a dedicated research-and-development department or on hiring specialists to solve a certain problem. At the same time, people can use their spare time and expertise to solve problems and earn rewards for their contributions. Other companies, such as P&G (Connect + Develop), Starbucks (My Starbucks Idea), Lego (Lego Ideas), Heineken (Innovators Brewhouse), and Marriott (Travel Brilliantly), successfully use open innovation to solicit ideas for novel products, services, or processes. Integrating external stakeholders into the innovation process, however, often involves making organizational data and knowledge accessible to the external stakeholders, so companies have to carefully balance the benefits and potential drawbacks of engaging in such initiatives.

TABLE 2.9 Some Predictions About Technology That Were Not Quite Correct

Year	Source	Quote
1876	Western Union, internal memo	“This ‘telephone’ has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us.”
1895	Lord Kelvin, president, British Royal Society	“Radio has no future. Heavier-than-air flying machines are impossible. X-rays will prove to be a hoax.”
1899	C. H. Duell, commissioner, U.S. Office of Patents	“Everything that can be invented has been invented.”
1927	H. M. Warner, Warner Brothers	“Who the hell wants to hear actors talk?”
1943	Thomas Watson, chairman, IBM	“I think there is a world market for maybe five computers.”
1949	<i>Popular Mechanics</i>	“Where a calculator on the ENIAC is equipped with 18,000 vacuum tubes and weighs 30 tons, computers in the future may have only 1,000 vacuum tubes and weigh only 1.5 tons.”
1957	Editor, business books, Prentice Hall	“I have traveled the length and breadth of this country and talked with the best people, and I can assure you that data processing is a fad that won’t last out the year.”
1968	<i>BusinessWeek</i>	“With over 50 foreign cars already on sale here, the Japanese auto industry isn’t likely to carve out a big slice of the U.S. market.”
1977	Ken Olsen, president, Digital Equipment Corporation	“There is no reason anyone would want a computer in their home.”
1989	Bill Gates, Microsoft	“We will never make a 32-bit operating system.”
2004	Bill Gates, Microsoft	“Spam will be a thing of the past in two years’ time.”
2005	Sir Alan Sugar	“Next Christmas the iPod will be dead, finished, gone, kaput.”
2007	Steve Ballmer, Microsoft	“There’s no chance that the iPhone is going to get any significant market share.”
2010	Steve Jobs, Apple	“This size is useless unless you include sandpaper so users can sand their fingers down to a quarter of their size.” (speaking about 7-inch tablets)

Organizational Requirements for Innovation

Certain types of competitive environments require that organizations remain at the cutting edge in their use of information systems. For example, consider an organization that operates within an environment with strong competitive forces (Porter, 1979). The organization has competitive pressures coming from existing rival firms or from the threat of entry of new rivals. It is critical for these organizations to do things better, faster, and more cheaply than rivals. These organizations are driven to use information systems to develop innovative products, services, or processes.

These environmental characteristics alone, however, are not enough to determine whether an organization should deploy a particular information system. Before an organization can deploy any new system well, its processes, resources, and risk tolerance must be capable of adapting to and sustaining the development and implementation processes.

PROCESS REQUIREMENTS. To sustain competitive advantage through innovation, people in the organization must be willing to do whatever they can to bypass and eliminate internal bureaucracy, set aside political squabbles, and pull together for the common good. Can you imagine, for example, a firm trying to deploy a web-based order entry system that enables customers to access inventory information directly when people in that firm do not even share such information with each other?

RESOURCE REQUIREMENTS. Organizations focusing on innovation must also have the human capital necessary to implement innovative systems or to develop innovative products, services,



COMING ATTRACTIONS

The CITE Project

Smart technology is popping up in more and more places. Everything from our watches to our toasters to our cars can communicate on the Internet. However, not every smart tech idea will integrate well with the real world. How can manufacturers and innovators test their technologies prior to bringing them to market to avoid risking complete failure? The CITE Project may be the answer.

When an innovative technology is released into the real world, it is not always used the way the inventor originally envisioned. The so-called “law of unintended consequences” can yield some interesting side effects based on how people actually use technologies. Texting while driving, for example, has only recently been realized to be a substantial safety issue. New and innovative approaches are needed to mitigate these types of risks. In order to get a better handle on what some of these potential issues may be before technologies are widely deployed, the telecommunications and tech firm Pegasus Global Holdings is working with a variety of partners to build a complete city in the desert.

The Center for Innovation, Testing, and Evaluation (CITE) will be a full-scale city designed to represent a broad swath of environments from across the United States. There will be a city center with civic buildings and parks, office space, industrial parks, and a variety of residential areas. The goal is to be as realistic as possible, with the exception of actual residents. The plan is to build CITE in the desert of southern New Mexico,

between the White Sands Missile Test Range (where the atomic bombs were tested) and the Mexico border.

CITE will allow new innovations to be tested at scale with minimal risk to the public. Everything from self-driving cars to smart homes to advanced thorium-based power supplies can be tried out in a controlled environment. This will give inventors the opportunity to see how their inventions actually behave in a real environment and make adjustments and improvements prior to bringing the technology to market. If successful, then maybe some of the pitfalls of widespread deployment of new technologies can be avoided. The challenge however, is that many of the unintended consequences of technologies are not realized until real people are allowed to use, misuse, and abuse them. Without actual residents and a real-world social context, critics doubt that CITE will be able to do more than serve as a glorified playground. As with any technology, though, the proof is in the doing—CITE could be operational as soon as 2018.

Based on:

Monks, K. (2015, October 6). CITE: The \$1 billion city that nobody calls home. *CNN*. Retrieved May 29, 2016, from <http://edition.cnn.com/2015/10/06/business/test-city/index.html>

The Center, New Mexico. (2016, March 12). In *Wikipedia, The Free Encyclopedia*. Retrieved May 29, 2016, from https://en.wikipedia.org/w/index.php?title=The_Center,_New_Mexico&oldid=709651961

or processes. The organization must have enough employees available with the proper systems knowledge, skills, time, and other resources to deploy these systems. Alternatively, the organization must have resources and able systems partners available to outsource the development of such systems if necessary.

RISK TOLERANCE REQUIREMENTS. The last characteristic of an organization focusing on innovation is that its members must have the appropriate tolerance for risk and uncertainty as well as the willingness to deploy and use new systems that may not be as proven and pervasive as more traditional technologies. If people within the organization desire low risk in their use of information systems, then gambling on cutting-edge systems will probably not be desirable or tolerable for them. Likewise, open innovation initiatives typically require sharing organizational knowledge with outside partners, and organizations trying to leverage outsiders in their innovation process have to be willing to accept the potential risks involved.

The Innovation Process

As you can see, using innovation to gain and sustain competitive advantage is difficult. For example, if you are using information systems to gain a competitive advantage in the area of operating efficiencies, it is likely that your rivals can just as easily adopt the same types of information systems and achieve the same gains. There are certainly ways to use information systems to create innovative products, services, or processes to gain a longer-lasting, sustainable competitive advantage; if you can use information systems to make your products or services unique or to cause your customers to invest so heavily in you that their switching costs are high (i.e., if switching to a competitor’s product involves significant investment in terms of time and/or

money for the customer), then you are better able to develop a competitive advantage that is sustainable over the long haul. For example, you might combine heavy investments in computer-aided design systems with very bright engineers in order to perfect your product and make it unique and something relatively difficult to copy. Alternatively, you might use a customer relationship management system to build an extensive database containing the entire history of your interaction with each of your customers and then use that system to provide very high-quality, intimate, rapid, and customized service that would convince customers that if they switched to a rival, it would take them years to build up that kind of relationship with the other firm.

ORGANIZING TO MAKE INNOVATION CHOICES. Given the need for constant innovation, how do organizations make decisions on which innovations to embrace and which to ignore? In the book *The Innovator's Solution*, Christensen and Raynor (2003) outline a process called the *disruptive growth engine*, which all organizations can follow to more effectively respond to radical innovations in their industry. This process has the following steps:

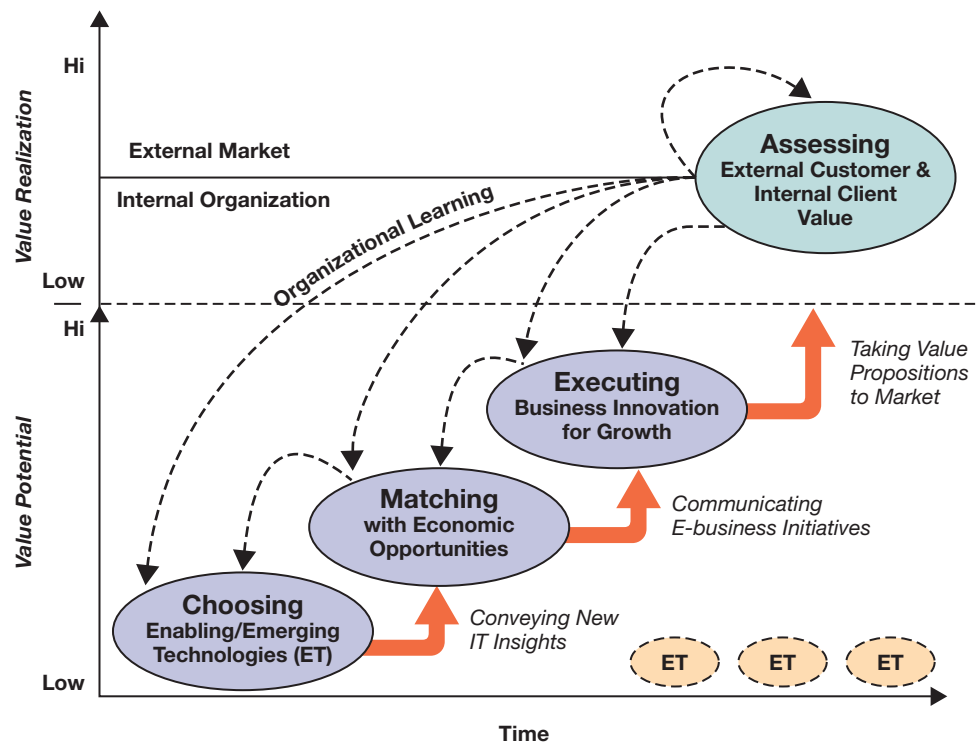
1. **Start Early.** To gain the greatest opportunities, become a leader in identifying, tracking, and adopting radical innovations by making these processes a formal part of the organization (budgets, personnel, and so on).
2. **Display Executive Leadership.** To gain credibility as well as to bridge sustaining and radical product development, visible and credible leadership is required.
3. **Build a Team of Expert Innovators.** To most effectively identify and evaluate potential radical innovations, build a competent team of expert innovators.
4. **Educate the Organization.** To see opportunities, those closest to customers and competitors (e.g., marketing, customer support, and engineering) need to understand how to identify radical innovations.

In addition to formalizing the identification of innovations within the organization, shifts in business processes and fundamental thinking about radical innovations are needed. Next, we examine how to implement the innovation identification process.

IMPLEMENTING THE INNOVATION PROCESS. Executives today who are serious about using information technology in innovative ways have made it a point to have their people be continually on the lookout for new radical innovations that will have a significant impact on their business. Wheeler (2002) has summarized this process nicely as the **disruptive innovation cycle** (Figure 2.20). The model essentially holds that the key to success for modern organizations is the

FIGURE 2.20

The disruptive innovation cycle.
 Source: Based on *Information Systems Research*, Vol. 13, No. 2, pp. 125–146, 2002.



extent to which they use information technologies and systems in timely, innovative ways. The vertical dimension of the disruptive innovation cycle shows the extent to which an organization derives value from a particular information technology, and the horizontal dimension shows time. Next, we examine the cycle.

Choosing Enabling/Emerging Technologies The first bubble (lower-left) shows that successful organizations first create jobs, groups, and processes that are all devoted to scanning the environment for new emerging and **enabling technologies** (i.e., information technologies that enable a firm to accomplish a task or goal or to gain or sustain competitive advantage in some way) that appear to be relevant for the organization. For example, an organization might designate a small group within the IS department as the “Emerging Technologies” unit and charge the group with looking for new technologies that will have an impact on the business. As part of its job, this group will pore over current technology magazines, participate in Internet discussion forums on technology topics, go to technology conferences and conventions, and have strong, active relationships with technology researchers at universities and technology companies.

Matching Technologies to Opportunities Next, in the second bubble, the organization matches the most promising new technologies with current **economic opportunities**. For example, the Emerging Technologies group might have identified advances in 3D printing as a key enabling technology that now makes faster and cheaper prototyping feasible. In addition, managers within the marketing function of the firm have recognized that competitors have not released new models recently, and reducing product development cycle times can provide an opportunity to gain customers and market share.

Executing Business Innovation for Growth The third bubble represents the process of selecting—among myriad opportunities to take advantage of—those emerging technologies that have the biggest potential to address the current opportunities. The organization decides to acquire 3D printers that enable it to create prototypes much faster, helping the company to release new product models at shorter intervals, in order to attract new customers.

Assessing Value The fourth bubble represents the process of assessing the value of that use of technology, not only to customers but also to internal clients (sales representatives, marketing managers, the chief operating officer, and so on).

THINKING ABOUT INVESTMENTS IN RADICAL INNOVATIONS. The disruptive innovation cycle suggests three new ways to think about investments in radical innovations:

1. **Put Technology Ahead of Strategy.** This approach says that technology is so important to strategy and to success that you have to begin with technology. Notice that the first bubble involves understanding, identifying, and choosing technologies that are important. The first bubble does not begin with strategy, as a traditional approach to running a business organization would suggest. In fact, many would argue that given how important technology is today and how fast it changes, if you start with a strategy and then try to retrofit technology into your aging strategy, you are doomed. This approach argues that you begin by understanding technology and develop a strategy from there. This approach is admittedly very uncomfortable for people who think in traditional ways and/or who are not comfortable with technology. We believe, however, that for many modern organizations, thinking about technology in this way is key.
2. **Put Technology Ahead of Marketing.** The second way that this approach turns conventional wisdom on its head is that, like strategy, marketing also takes a backseat to technology. Think about it carefully, and you will see that marketing does not come into play until later in this model. A very traditional marketing-oriented approach would be to go first to your customers and find out from them what their needs are and what you ought to be doing with technology. The trouble with this approach is that, given the rapid evolution of technology, your customers are not likely to know about new technologies and their capabilities. In some sense, they are the last place you ought to be looking for ideas about new technologies and their impact on your business. Indeed, if they know about the new technology, then chances are your competitors already do too, meaning that this technology



SECURITY MATTERS

The Bangladesh SWIFT Theft

Information systems have made business faster and more efficient in almost any industry, from agriculture to banking. This has widely benefitted our society, but the flip side is that crime and theft can be faster and more efficient as well. Two banks in Southeast Asia recently learned the hard way that cybertheft can be massive and quick, with nearly US\$81 million disappearing almost instantly and without a trace.

The Society for Worldwide Interbank Financial Telecommunication (SWIFT) is an organization that enables banks to rapidly clear financial transactions on a global basis. The society is owned by its members, who pay fees to provide for the technological infrastructure that enables quick and seamless financial transactions, such as clearing international money orders or settling very large transactions between governments and large financial services entities. The system has been in place since the 1970s and, as of September 2010, linked more than 9,000 financial institutions in 209 countries and territories, which were exchanging an average of more than 15 million messages per day.

In February 2016, attackers successfully penetrated the central banking system of Bangladesh and used the SWIFT system to initiate the transfer of nearly a billion dollars out of the country's accounts. US\$81 million worth of these transactions cleared before a spelling error caught the attention of a recipient institution and the transfers were halted. The hackers not only gained access to the system and initiated the transfers, but they used malware to cover up their activity as well—as all transactions were logged to a hard-copy printer, the hackers intercepted the print jobs, effectively making the transactions invisible. This type of combined social-engineering and malware-based attack is very difficult to defend against and

serves to illustrate the disparity in the level of sophistication between the attackers and the bank employees charged with protecting their systems. A few months later, the attackers struck again and moved an undisclosed amount of money in the Philippines.

One of the more disturbing aspects of these crimes is the fact that the SWIFT system itself was not compromised. However, attackers were able to exploit the weaknesses in security at a member organization bank and use that organization as a stepping-off point to the broader network. Once they were inside the system, they were assumed to be trusted actors executing legitimate transactions. SWIFT is investigating the implementation of additional network level security protocols and procedures but is simultaneously reminding member banks of the pressing need to secure their own houses as well. Still, the issues continue; in mid-2016, attackers had stolen large sums not only in Bangladesh but also from banks in Ecuador and the Ukraine.

Based on:

Corkery, M. (2016, May 12). Once again, thieves enter Swift financial network and steal. *The New York Times*. Retrieved May 29, 2016, from <http://www.nytimes.com/2016/05/13/business/dealbook/swift-global-bank-network-attack.html>

Gladstone, R. (2016, March 15). Bangladesh bank chief resigns after cyber theft of \$81 million. *The New York Times*. Retrieved May 29, 2016, from <http://www.nytimes.com/2016/03/16/world/asia/bangladesh-bank-chief-resigns-after-cyber-theft-of-81-million.html>

Society for Worldwide Interbank Financial Telecommunication. (2016, May 27). In *Wikipedia, The Free Encyclopedia*. Retrieved May 29, 2016, from https://en.wikipedia.org/w/index.php?title=Society_for_Worldwide_Interbank_Financial_Telecommunication&oldid=722327785

is not the one to rest your competitive advantage on. As Steve Jobs of Apple put it, “You can’t just ask people what they want and then try to give that to them. By the time you get it built, they’ll want something new.”

3. **Innovation Is Continuous.** The third way that this approach is interesting—and potentially troubling—is that the process has to be ongoing. As shown along the time dimension at the bottom of the graph, the first bubble repeats over and over again as the Emerging Technologies group is constantly on the lookout for the “next new thing” that will revolutionize the business. The rate of information technology evolution is not likely to slow down, and innovative organizations truly cannot—and do not—ever rest.

Today, dealing with rapid change caused by radical innovations is a reality for most industries. If you are a leader in an industry, you must continually learn to embrace and exploit radical innovations, potentially *destroying* your existing core business while at the same time building a new business around the radical innovation. If you fail to do this, your competition may do it for you.

Startups and Crowdfunding

In recent years, we have witnessed the emergence of many highly successful innovative startups, with some having quickly developed into multibillion-dollar companies.

Startups—typically technology-based new ventures with high potential for scalability and growth—are often cofounded by entrepreneurs, developers, designers, or others with a promising idea. In the past, startups have been founded around services or platforms enabled by information systems. Advances in technologies such as 3D printing (see Chapter 1) have enabled hardware startups that build their business models around innovative physical objects, ranging from Coin’s electronic credit card to the Square Reader developed by payment startup Square (which in early 2016 filed to go public). At the same time, 3D printing has the potential to disrupt traditional supply chains, as consumers will eventually be able to produce products in their own homes, opening up an even larger market for new, innovative ventures (EY, 2016b).

However, even with the ability to relatively quickly develop prototypes of innovative products, going from invention to developing product designs and manufacturing processes and then manufacturing enough stock to meet the planned initial demand requires not only a great idea for an excellent product but also knowledge about the business environment, connections with the business community, and often substantial financial resources. To obtain the needed support, many startups turn to so-called startup incubators, which provide various types of education and other resources. Relatedly, startup accelerators typically provide education, investment, and intense mentorship for cohorts of startups. On the other hand, angel investors can be a valuable source for funding (but often only provide limited education or mentorship). Recently, crowdfunding—through platforms such as Kickstarter or Indiegogo—has emerged as a novel form of obtaining project funding. **Crowdfunding** is the securing of business financing from individuals in the marketplace—the “crowd”—to fund an initiative (see Figure 2.21). Individuals who support a given initiative—called “backers”—pledge a certain amount of financial support to the project in return for certain benefits. In the case of Kickstarter, a funding campaign usually centers around a product—such as a smartphone case, a belt, an electronic gadget, or even a board game. Interested backers pledge money in support of the product, generally above a minimum

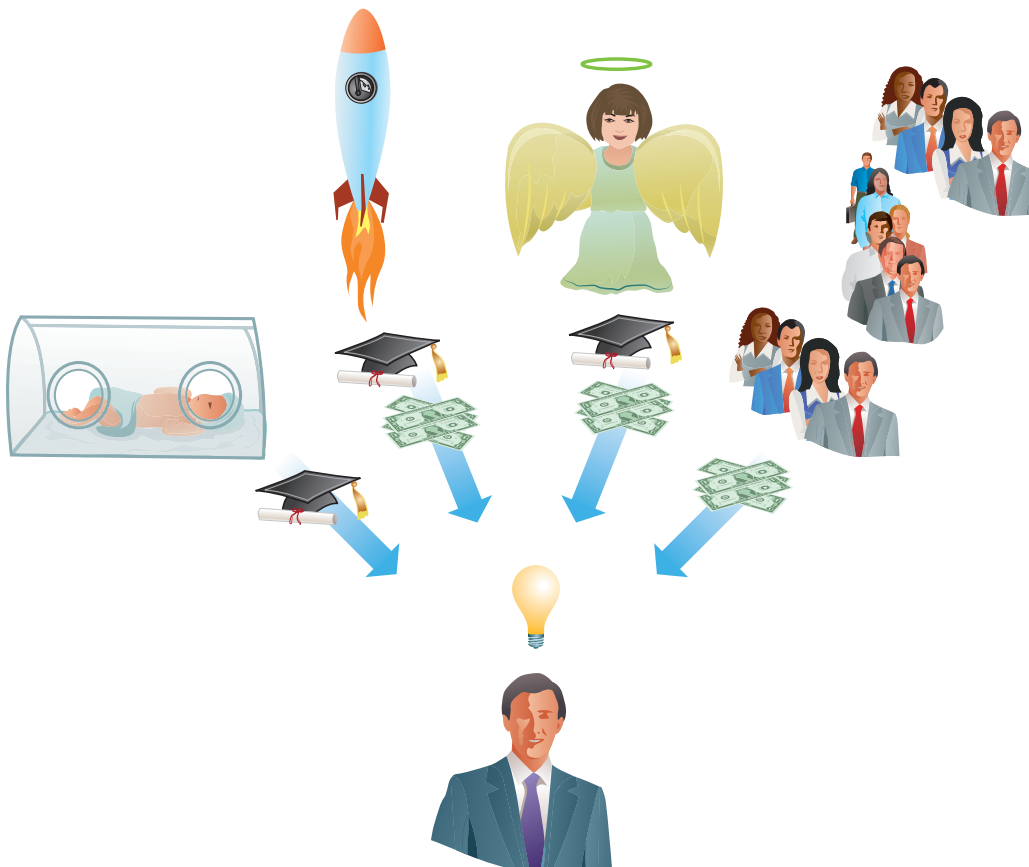


FIGURE 2.21

Inventors and startups can draw on many sources for support.

amount in return for one count of the item being backed. If (and only if) the campaign reaches its funding goal, the backers are charged the amount they pledged and the product goes into production. If too few backers are interested and the goal is not met, the campaign fails and no backers are charged any money. Kickstarter in particular has been very successful and has helped many campaigns get funded, totaling more than 135,000 projects with more than US\$1 billion generated in pledges. Similarly, equity crowdfunding (sometimes called crowdfunding) is the securing of financing from individuals, but the backers receive equity in return for their investment.

In this chapter, we examined how organizations can use information systems strategically, enabling them to gain or sustain competitive advantage over their rivals. As ongoing success depends on a sustained commitment to continuously learn and innovate, organizations must continuously search and apply the most effective business models.



INDUSTRY ANALYSIS

Education

For decades, the cost of higher education in the United States has steadily increased (an average increase of 16 percent every 5 years for the past four decades), and the average college graduate entered the workforce with about US\$37,000 in student loans in 2016. Several emerging changes in the education industry hold the promise of bringing those costs down. Information systems are at the core of these exciting developments.

One way education is changing is through globalization. Universities increasingly partner with other universities around the world, encouraging collaboration among researchers, consistency in curriculum design, and cross-border movement of students, graduates, and faculty. Many countries outside of the United States and other Western countries are investing heavily in their education systems, and there are now many universities in less developed parts of the world that can compete with the best of the “old-school” Ivy League universities. The global economy has produced an equally global education system.

Along with the trend of globalization, many universities are extending their reach by implementing online courses or, in many cases, whole degrees that can be obtained via remote, self-directed courses delivered over the Internet. These programs are typically far less expensive to administer because once the materials are produced and refined, they can be used repeatedly by large groups of (paying) students. Some argue that such courses are less engaging and/or less effective, and there may be some truth to that. Regardless, universities continue to forge ahead in finding new ways to reach more students.

Another recent trend in education is the proliferation of so-called massively open online courses (MOOCs). These courses,

which are freely available to the public, are able to effectively reach millions of students. Some very prestigious schools participate in providing these free courses, including Stanford, Wharton School of Business, UC Berkeley, MIT, and Harvard. While the course content is provided free of charge, many of these institutions generate revenue by charging students for certifications or tutoring services.

Clearly, higher education is changing rapidly and in very significant ways, and technology has enabled each of these changes.

Questions

1. Are online courses better or worse as compared with traditional, face-to-face courses? Why?
2. In what ways could technology be used to improve on the deficiencies of online courses?

Based on:

Anonymous. (2016, May 2). African Universities urged to utilize online interactions. *Citi FM Online*. Retrieved May 29, 2016, from <http://citifmonline.com/2016/05/02/african-universities-urged-utilize-online-interactions>

Anonymous. (2016). A look at the shocking student loan debt statistics for 2016. *Student Loan Hero*. Retrieved May 29, 2016, from <https://studentloanhero.com/student-loan-debt-statistics-2016>

Friedman, J. (2016, May 12). 3 reasons to try out MOOCs before applying to college. *US News and World Report*. Retrieved May 29, 2016, from <http://www.usnews.com/education/online-education/articles/2016-05-12/3-reasons-to-try-out-moocs-before-applying-to-college>

Massive open online course. (2016, May 24). In *Wikipedia, The Free Encyclopedia*. Retrieved May 29, 2016, from https://en.wikipedia.org/w/index.php?title=Massive_open_online_course&oldid=721913401

Key Points Review

1. **Discuss how information systems can be used for automation, organizational learning, and strategic advantage.** Information systems are used at different levels of an organization to support automating and organizational learning and to support strategy. To apply information systems strategically, you must understand the organization's competitive landscape as well as the value chain and be able to identify opportunities in which you can use information systems to make changes or improvements in the value chain to gain or sustain a competitive advantage.
2. **Describe how information systems support business models used by companies operating in the digital world.** Organizations utilize information systems investments as a central component for executing their business models and delivering their value proposition. Common revenue models include affiliate marketing, subscriptions, licensing, transactions fees, sales, and web advertising revenue. The freemium model for providing digital products or services has become a widely used strategy for quickly building a large user base and monetizing additional features provided. Fueled by information systems, many organizations are extremely successful by building platforms or offering their products as services.
3. **Explain why and how companies are continually looking for innovative ways to use information systems for competitive advantage.** In order to gain or sustain competitive advantage, organizations have to continuously innovate. As product innovations are often easily copied, organizations have to combine various types of innovation in their business models. Given that new technologies are not as stable as traditional ones, being at the technological cutting edge is typically quite difficult to execute. To best deploy new technologies, organizations must be ready for the business process changes that will ensue, have the resources necessary to deploy new technologies successfully, and be tolerant of the risk and problems involved in being at the cutting edge. Deploying emerging information systems is an ongoing process in which organizations should continuously scan the environment for emerging and enabling (and potentially disruptive) technologies, narrow down the list to those technologies that match with the challenges the firm faces or that create economic opportunities, choose a particular technology, implement it in a way that enables them to gain or sustain a competitive advantage, and assess the value of the technology.

Key Terms

affiliate marketing	90	enabling technology	105	resources	86
augmented reality	98	executive level	80	revenue model	90
automating	81	first-mover advantage	84	semistructured decision	79
best-cost provider strategy	85	freemium	92	sharing economy	94
business/IT alignment	89	functional area information system	81	startup	106
business model	89	gig economy	94	strategic necessity	89
business process	78	in-app purchases	92	strategic planning	84
capabilities	86	innovation	97	structured decision	78
collaborative economy	94	key performance indicator (KPI)	80	transaction	78
crowdfunding	107	low-cost leadership strategy	85	unstructured decision	80
differentiation strategy	85	managerial level	79	value chain	88
disruptive innovation	97	open innovation	101	value chain analysis	88
disruptive innovation cycle	104	operational level	78	value creation	86
distinctive competency	86	organizational learning	83	value proposition	89
economic opportunities	105	organizational strategy	84	virtual reality (VR) headset	97
effectiveness	79	platform	93	XaaS	95
efficiency	78	radical innovation	97		

Review Questions

- MyLab MIS 2-1.** Compare and contrast the characteristics of the operational, managerial, and executive levels of an organization.
- 2-2.** Compare and contrast automating and learning.
- 2-3.** Describe competitive advantage and list six sources.
- 2-4.** How do an organization's resources and capabilities result in a competitive advantage?
- 2-5.** Compare and contrast pipe- and platform-based business models.
- MyLab MIS 2-6.** What is the freemium model, and how can a business successfully use this approach?
- 2-7.** Why is successful application of innovative technologies and systems often difficult?
- MyLab MIS 2-8.** How can information systems help in combining multiple types of innovation?
- 2-9.** Using past examples, explain what is meant by a radical innovation.
- 2-10.** Describe the disruptive innovation cycle.

Self-Study Questions

- 2-11.** _____ is using technology as a way to help complete a task within an organization faster and, perhaps, more cheaply.
- Automating
 - Learning
 - Strategizing
 - Processing
- 2-12.** What are new technologies, products, or services that eventually surpass the existing dominant technology or product in a market called?
- open innovation
 - radical innovation
 - incremental innovation
 - radical change
- 2-13.** Which of the following is *not* improving the value chain?
- improving procurement processes
 - increasing operating costs
 - minimizing marketing expenditures
 - streamlining production processes
- 2-14.** A company is said to have _____ when it has gained an edge over its rivals.
- monopoly
 - profitability
 - competitive advantage
 - computer advantage
- 2-15.** Each of the following was described in this chapter as a source of competitive advantage *except* for _____.
- delivering superior customer service
 - achieving lower cost than rivals
 - being the subject of a hostile takeover
 - having shorter lead times in developing and testing new products
- 2-16.** _____ involves creating new products, processes, or services that return value to the organization.
- Startup culture
 - Creativity
 - Invention
 - Innovation
- 2-17.** What is the process of choosing, matching, executing, and assessing innovative technologies called?
- environmental scanning
 - disruptive innovation cycle
 - strategic planning
 - none of the above
- 2-18.** The revenue model involving the referring of customers to another business is called _____.
- referral marketing
 - Internet marketing
 - affiliate marketing
 - ad marketing
- 2-19.** At the _____ level of the organization, functional managers (e.g., marketing managers, finance managers, manufacturing managers, and human resource managers) focus on monitoring and controlling operational-level activities and providing information to higher levels of the organization.
- operational
 - managerial
 - organizational
 - executive
- 2-20.** A supervisor's having to decide when to reorder supplies or how best to allocate personnel for the completion of a project is an example of a(n) _____ decision.
- structured
 - unstructured
 - automated
 - delegated

Answers are on page 112.

Problems and Exercises

- 2-21.** Match the following terms with the appropriate definitions:
- i. value chain analysis
 - ii. freemium
 - iii. managerial level
 - iv. value chain
 - v. disruptive innovation cycle
 - vi. sharing economy
 - vii. platform
 - viii. open innovation
 - ix. radical innovation
 - x. operational level
- a. A business model that enables others—both other businesses and users—to co-create value, such that some users create value and other users consume
 - b. The process of analyzing an organization’s activities to determine where value is added to products and/or services and the costs that are incurred for doing so
 - c. An economic system in which assets or services are shared between private individuals, either free or for a fee, typically by means of the Internet
 - d. The middle level of the organization, where functional managers focus on monitoring and controlling operational-level activities and providing information to higher levels of the organization
 - e. A model suggesting that the extent to which modern organizations use information technologies and systems in timely, innovative ways is the key to success
 - f. Giving away limited versions of a digital product or service for free in order to build a large customer base, and charging a premium for unrestricted versions
 - g. The set of primary and support activities in an organization where value is added to a product or service
 - h. An innovation that uses markedly new or different technology to provide significantly greater customer benefits, and eventually marginalizes or replaces existing products or services
 - i. The process of integrating external stakeholders into the innovation process
 - j. The bottom level of an organization, where the routine day-to-day interactions with customers occur
- 2-22.** Interview the owner of a small local store. How many decision-making levels does this business have? What are the types of short-term and long-term decisions and information needs?
- 2-23.** Compare and contrast structured and unstructured decisions you had to make. Which ones were more difficult? Why?
- 2-24.** Identify a company utilizing the distinct competitive strategies shown in Figure 2.11; provide evidence to support your selection.
- 2-25.** Of the five competitive forces presented in the chapter (Porter’s model), which is the most significant for an organization in terms of making IS investment decisions? Why? Which is the least significant? Why?
- 2-26.** Using a company you are familiar with, identify the areas of the value chain where the company can save costs or improve processes through IS.
- 2-27.** Using an organization you are familiar with, analyze the different components of its business model. What are the biggest drivers of costs, and how could the organization use IS to reduce costs?
- 2-28.** Search the Web for different ways in which you could use advertising to generate money from your website. How do different models work?
- 2-29.** Do you use any freemium-based services? Would you pay for additional functionality? Why or why not?
- 2-30.** Find and describe an example not discussed in this chapter that demonstrates the use of multiple types of innovation.
- 2-31.** Find and describe an example not discussed in this chapter that demonstrates the transition from a product-based to a service-based business model.
- 2-32.** Describe a company you are familiar with. How innovative is it? How does it fare on the organizational requirements for innovation?
- 2-33.** Find an example (not mentioned in the chapter) of a disruptive innovation. What product/service is being disrupted? What is the impact on the industry/customers?
- 2-34.** Go to a website that generates revenue through advertising. In how far do the online ads appear to be relevant to your interests or browsing history? If you visit the same websites from a public computer, do the ads differ? Why?
- 2-35.** What are the benefits of open innovation? For an organization, why may open innovation be problematic?

Application Exercises

Note: The existing data files referenced in these exercises are available on the book's website: www.pearsonglobaleditions.com/valacich.

Spreadsheet Application: Valuing Information Systems

- 2-36.** The cost of maintaining information systems is high for Campus Travel. You have been assigned to evaluate the total cost of ownership (TCO) of a few systems that are currently in use by Campus Travel employees. Take a look at the TCO.csv file to obtain the list of systems that are in use and the costs associated with maintaining the software, hardware, and the associated personnel for each type of system. Calculate the following for your operations manager:
- The costs for server hardware by adding a new row to include web servers. This includes US\$4,500 for the main campus and US\$2,200 for the other campuses.
 - The TCO for the entire information system used at Campus Travel. Hint: Sum all the values for all the systems together.

- The TCO for servers and network components of the information system.
- Make sure that you format the table, including using the currency format, in a professional manner.



Database Application: Building a System Usage Database

- 2-37.** To understand the assets in Campus Travel, the IS manager has asked you to design a database that would be able to store all the assets. Your manager asks you to do the following:
- Create a new blank database called asset.mdb.
 - Create a new table called “assets” in the asset database with the following fields:
 - a. Item ID (Text field)
 - b. Item Name (Text field)
 - c. Description (Memo field)
 - d. Category (hardware, software, other)
 - e. Condition (new, good, fair, poor)
 - f. Acquisition Date (Date field)
 - g. Purchase Price (Currency field)
 - h. Current Value (Currency field)

Team Work Exercise

Net Stats: Online Searching

The Google search engine has become so popular with Internet users that the word *Google* is often used as a verb (“I Googled the restaurant to see its reviews”), but there are other well-known search engines, such as Yahoo! and Microsoft’s Bing. Table 2.10 shows the percentage of Internet surfers who used each search engine (i.e., the search engines’ market share) in June 2016 as compared with June 2014.

Questions and Exercises

- 2-38.** Search the web for the most up-to-date statistics about the search engine market.
- 2-39.** As a team, interpret these numbers. What is striking/important about these statistics? How do the numbers compare to your own search behavior?
- 2-40.** How have the numbers changed? Will there be other important players in the search engine market?
- 2-41.** Using your spreadsheet software of choice, create a graph/figure that effectively visualizes the statistics/changes you consider most important.

TABLE 2.10 Top Search Engines by Market Share, June 2016 Compared with June 2014

Search Engine	June 2016 Market Share (%)	June 2014 Market Share (%)	Change (percentage points)
Google	77.6	73.4	3.2
Baidu	6.0	14.4	-8.4
Yahoo!	6.2	6.6	-0.4
Bing	8.7	4.9	3.8
Others	1.5	0.8	0.7

Source: Based on Top Search Engine Share Trend, published by Net Applications.com, 2015.

Answers to the Self-Study Questions

- | | | | | |
|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|
| 2-11. A, p. 81 | 2-12. B, p. 105 | 2-13. B, p. 88 | 2-14. C, p. 84 | 2-15. C, p. 88 |
| 2-16. D, p. 97 | 2-17. B, p. 97 | 2-18. C, p. 90 | 2-19. B, p. 79 | 2-20. A, p. 78 |

CASE 1 | LinkedIn

The Internet and the emergence of mobile, social, and cloud computing have enabled new business models, of which the platform-based business model is one of the most interesting. Many of today's revolutionary businesses are based on providing digital platforms through which users create value as well as consume user-created content. One example of a platform-based business is LinkedIn, a social networking service used for professional networking.

LinkedIn was founded in 2002 and launched in 2003. It is mainly used by job seekers to post their CVs and by employers to post job applications. In 2016, it had more than 467 million user accounts, of which 106 million were active users across more than 200 countries and territories, and it was available in 24 languages.

The vast number of users is one critical factor for LinkedIn's success. Since platform-based businesses do not require the company itself to provide services and products, they depend largely on their users to offer and consume services. The network only has value if users participate, and this dictates the success or failure of the business. LinkedIn is constantly growing its user base, which is not only enabling its business model but also strengthening its competitive advantage against possible rivals.

LinkedIn's revenue model is based on taking advantage of the many possibilities offered by information systems that support business models. According to LinkedIn, the company's revenues come from talent solutions, marketing solutions, and premium subscription products. Talent solutions offer recruiters and companies the ability to search

for employees and advertise job openings. Marketing solutions let other companies add sponsored content and ads to the service. The premium subscriptions product gives users access to advanced services, such as tools for job seeking that are not available in the free profile, for a fee. By Q3 in 2016, most of LinkedIn's revenue came from talent solutions (65 percent), while marketing solutions and premium subscriptions added up to almost 20 percent of the revenue each. The company's total revenue by this time was \$960 million.

With help of information systems, LinkedIn has proven itself capable of providing added value to its users compared to the traditional job-seeking process offline. When it was first launched in 2003, LinkedIn wasn't the first service to enter the market using information systems for job searches, but it managed to differentiate itself from other social networking services and grow its user base before similar services caught up. At the moment, current competitors such as Viadeo and XING are far behind LinkedIn, with significantly fewer users. LinkedIn is fairly well protected against new competitors as users are reluctant to change to a totally new service when they have invested in creating content and networks through one service. The most relevant competitive threat comes from other established social networks with a wide user base; one example is Facebook, which announced a new service called Facebook Jobs in the fall of 2016.

In order to stay ahead of the competition, it is important for LinkedIn to use information systems in innovative ways to differentiate its services. LinkedIn continuously

provides users with new features in order to expand the ways people use the service. For example, in 2008 LinkedIn added an applications platform that lets users link external services such as blog postings to their profile. Another example is LinkedIn Salary, a feature announced on November 2016, which lets users submit and browse salary information anonymously. In addition to adding new features in-house, LinkedIn has also delivered new services for users via business purchases. LinkedIn has made several acquisitions such as online education company Lynda.com in 2015, which provided users with access to Lynda.com's 9,000 online courses via an online learning platform called LinkedIn Learning. The idea was to help professionals gain the specific skills that are required by companies as well as to help companies provide tailored course entities for their employees while following their progress.

What the future of LinkedIn will be remains to be seen. In June 2016, Microsoft announced that it was acquiring LinkedIn for \$26.2 billion, the software giant's biggest acquisition so far. The deal was finalized in December 2016. One reason for Microsoft's interest in LinkedIn was to connect the service to its assets, such as Office 365, Exchange, and Outlook. In addition, Microsoft also gained access to LinkedIn's database, with the personal profiles and professional connections of over 400 million users. Although Microsoft has announced that LinkedIn will continue to operate as an independent business, the turbulence around the acquisition might give an opening for competitors like Facebook Jobs.

Questions

- 2-42. Using examples, describe possible revenue models related to social networking services.
- 2-43. How has LinkedIn provided users with added value in comparison to traditional job seeking?
- 2-44. In what ways has LinkedIn protected itself from competition?

Based on:

Anonymous. (2016). About us. *LinkedIn*. Retrieved November 20, 2016, from <https://press.linkedin.com/about-linkedin>.

Constine, Josh. (2016, November 7). Facebook threatens LinkedIn with job opening features. *Techcrunch*. Retrieved November 20, 2016, from <https://techcrunch.com/2016/11/07/jobbook/>.

DeNisco, Alison (2016, October 24). Can LinkedIn Learning help train your employees? *TechRepublic*. Retrieved December 19, 2016, from <http://www.techrepublic.com/article/can-linkedin-learning-help-train-your-employees/>.

Feller, Grant (2016, June 14). This is the real reason Microsoft bought LinkedIn. *Forbes*. Retrieved December 19, 2016, from <http://www.forbes.com/sites/grantfeller/2016/06/14/this-is-the-real-reason-microsoft-bought-linkedin/#48fb42f4acd4>.

Waters, Richard (2016, November 3). Microsoft-LinkedIn deal raises new competition concerns. *Financial Times*. Retrieved November 20, 2016, from <https://www.ft.com/content/d5ceda60-a1e1-11e6-82c3-4351ce86813f>.

CASE 2 | Streaming Video

Remember the old brick-and-mortar movie rental services? You drove to the physical location, scanned shelves for your movie of choice (too frequently, it wasn't in), paid the clerk, and left. The flick was due back in 24 hours (or, at most, 3 to 5 days later), or you were billed a hefty late fee. In some cases, forgetful customers answered the door to find a police officer asking why they hadn't returned a rental movie.

Movie rental stores still exist but in quickly dwindling numbers. Many alternatives have spawned, beginning with Netflix, the first and now the world's largest online movie service. Though originally started as a mail-order DVD rental service, Netflix has rapidly embraced the streaming video market. As of December 2013, Netflix offered its 81 million subscribers in 190 countries tens of thousands of movie and television titles and, in 2015, accounted for 37 percent of all downstream web traffic during prime-time hours (the major streaming services combined accounted for a whopping 70 percent). Though Netflix continues to battle rising costs as movie and TV studios raise their licensing fees, the company continues to dominate in the streaming market.

Other competitors have entered the market as well. Amazon's Prime subscription service, in addition to providing discounts on fast shipping for all products, provides subscribers access to a vast library of movie and TV content. This content is available to users via Amazon's mobile devices, like the

Kindle Fire, as well as the recently released Amazon FireTV, a US\$99 set-top box that also supports gaming.

Apple and Google also compete in this space, though currently with a slightly different approach. iTunes has long been the leader in digital music distribution, and Apple moved seamlessly to movie and TV distribution as those became popular. The distinction from the Netflix and Amazon models is that iTunes provides a rental and purchasing marketplace, where customers can pay for temporary rights to a movie (rental) or may pay a higher price to purchase the movie for indefinite ownership. The Google Play store uses a similar rental/purchase model. The advantage of this model is that movie and TV studios are much more willing to participate in this type of distribution (which mirrors physical movie and TV distribution and the accompanying revenues). As a result, these marketplaces typically provide the latest, most popular movies. In contrast, a drawback of Netflix and Amazon's streaming services is their limited selection of popular or recent titles, as their streaming libraries are dependent on content deals they have made with individual studios.

One of the major advantages to these digital video distribution services is their ability to personalize a customer's experience to a degree previously not possible. These personalized services learn about a user's preferences according to the movies

they frequently watch. From this data, the company creates a profile of each customer and a list of recommended movies. If, for example, a customer liked the movie *Prometheus*, he or she may also like the 1979 sci-fi classic *Alien*, and that movie will be included in a list of suggested movies. Customers can refine the recommendations by rating titles according to their preferences. These systems allow customers to tap large databases of movies, many of which they may not have been aware of at all.

Consider how fast things are changing. Just a few years ago, the only way to watch a movie other than paying to purchase it was to drive to a movie rental store like Blockbuster or Hollywood Video and pay to borrow a DVD for a few days. Today, that same entertainment can be obtained via any computer or mobile device or through an increasing number of "connected" TVs, Blu-ray players, or small video-streaming devices like the Amazon FireTV, AppleTV, or Google's Chromecast. These services and devices have completely disrupted the movie rental business. Hollywood Video, once a major competitor to Blockbuster Video with stores all over the U.S., declared bankruptcy in 2010 and closed all of its stores. Blockbuster Video slowly bled customers until it too declared bankruptcy in 2010. Some stores remained open for a few years, but as of June 2016, customers could find the Blockbuster name on a mere 19 locations.

Questions

- 2-45. In what ways has technology enabled the transformation and destruction of the traditional video rental industry?
- 2-46. Paid programming from cable companies still largely follows the model it has been following for the past few decades. How will technology and the public's appetite for on-demand, streaming video change the cable television industry in the coming years?
- 2-47. Discuss whether and how Netflix or Amazon can continue to grow their business and revenues in the streaming video market.

Based on:

Blockbuster LLC. (2016, June 26). In *Wikipedia, The Free Encyclopedia*. Retrieved June 26, 2016, from https://en.wikipedia.org/w/index.php?title=Blockbuster_LLC&oldid=727037281

Netflix. (2016, June 24). In *Wikipedia, The Free Encyclopedia*. Retrieved June 26, 2016, from <https://en.wikipedia.org/w/index.php?title=Netflix&oldid=726823307>

The Canadian Press. (2015, December 7). Netflix, YouTube video streaming dominate internet traffic in North America. *CBC news*. Retrieved June 26, 2016, from <http://www.cbc.ca/news/technology/video-streaming-traffic-1.3354182>

MyLab MIS™

Go to mymislab.com for the following assisted-graded writing questions.

- 2-48. List and describe five general types of organizational strategy.
- 2-49. What is a business model, and what are its primary components?

References

- Alavi, M., & Young, G. (1992). Information technologies in an international enterprise: An organizing framework. In S. Palvia, P. Palvia, & R. Zigli (Eds.), *Global issues in information technology management* (pp. 495–516). Harrisburg, PA: Idea Group.
- Applegate, L. M., Austin, R. D., & Soule, D. L. (2009). *Corporate information strategy and management* (8th ed.). New York: McGraw-Hill.
- Avakian, T. (2015, July 28). Oculus Rift is letting travelers experience destinations in a whole new way before they visit. *Business Insider*. Retrieved April 8, 2016, from <http://www.businessinsider.com/how-oculus-rift-is-impacting-travel-2015-7>
- Bakos, J. Y., & Treacy, M. E. (1986). Information technology and corporate strategy: A research perspective. *MIS Quarterly*, 10(2), 107–120.
- Bonchek, M., & Chuodary, S.P. (2013, January 31). Three elements of a successful platform strategy. *Harvard Business Review*. Retrieved March 22, 2016, from <https://hbr.org/2013/01/three-elements-of-a-successful-platform>
- Casanova, S. (2013, November 12). Washington Metro goes green & saves green with Philips performance lighting contract, delivering on sustainability goals with 15 million kWh saved annually. *Philips.com*. Retrieved April 7, 2016, from <http://www.usa.philips.com/a-w/about/news/archive/standard/news/press/2013/20131112-Philips-WMATA.html>
- Chandy, R. K., & Tellis, G. J. (1998). Organizing for radical product innovation: The overlooked role of willingness to cannibalize. *Journal of Marketing Research*, 35(4).
- Chelen, M. (2016, January 26). SuperData's 2015 stats place League of Legends and Clash of Clans at the top. *MMOS.com*. Retrieved April 6, 2016, from <http://mmos.com/news/superdatas-2015-stats-place-league-of-legends-and-clash-of-clans-at-the-top>
- Chesbrough, H. (2012, November 4). Open services innovation. *Innovation Excellence*. Retrieved April 7, 2016, from <http://www.innovationexcellence.com/blog/2012/11/04/open-services-innovation>
- Christensen, C. M. (1997). *The innovator's dilemma*. Boston: Harvard Business School Press.
- Christensen, C. M., & Raynor, M. E. (2003). *The innovator's solution: Creating and sustaining successful growth*. Boston: Harvard Business School Press.
- Christensen, C. M., Roth, E. A., & Anthony, S. D. (2004). *Seeing what's next: Using theories of innovation to predict industry change*. Boston: Harvard Business School Press.
- Choudary, S. P. (2013). Why business models fail: Pipes vs. platforms. *Wired.com*. Retrieved March 23, 2016, from <http://www.wired.com/insights/2013/10/why-business-models-fail-pipes-vs-platforms>
- Daugherty, P., Banerjee, P., Negm, W. & Alter, A. E. (2015). Driving unconventional growth through the Industrial Internet of Things. *Accenture*. Retrieved June 29, 2016, from https://www.accenture.com/us-en/_acnmedia/Accenture/next-gen/reassembling-industry/pdf/Accenture-Driving-Unconventional-Growth-through-IIoT.pdf
- Economist*. (2013, May 9). The rise of the sharing economy. *Economist*. Retrieved March 22, 2016, from <http://www.economist.com/news/leaders/21573104-internet-everything-hire-rise-sharing-economy>
- EY. (2016a). Can corporate venture help companies solve the innovation paradox? *EY.com*. Retrieved April 15, 2016, from <https://betterworkingworld.ey.com/disruption/corporate-venture-solve-innovation-paradox>
- EY. (2016b). The Internet of Everything is closer than you think. *EY.com*. Retrieved April 16, 2016, from <https://betterworkingworld.ey.com/better-questions/internet-of-things-everything>
- Garvin, D. A. (1993). Building a learning organization. *Harvard Business Review*, 71(4), 78–91.
- Gaudiosi, J. (2015, September 2). This company is redesigning how it works with virtual reality. *Fortune*. Retrieved April 8, 2016, from <http://fortune.com/2015/09/02/virtual-reality-interior-design>
- Hathaway, I. (2016, March 1). What startup accelerators really do. *Harvard Business Review*. Retrieved June 26, 2016, from <https://hbr.org/2016/03/what-startup-accelerators-really-do>
- Hitt, M. A., Ireland, R. D., & Hoskisson, R. E. (2015). *Strategic management: Competitiveness and globalization* (11th ed.). Boston: South-Western.
- Jacobs, H. (2015, March 19). Gaming guru explains why “freemium” is actually the best business model for multiplayer video games. *Business Insider*. Retrieved April 6, 2016, from <http://www.businessinsider.com/sean-plott-explains-why-he-thinks-freemium-games-are-the-best-business-model-for-both-players-and-developers-2015-3>
- Karimi, J., & Konsynski, B. R. (1991). Globalization and information management strategies. *Journal of Management Information Systems*, 7(4), 7–26.
- Keeley, L., Pikkil, R., Quinn, B., & Walters, H. (2013). *Ten types of innovation: The discipline of building breakthroughs*. Hoboken, NJ: Wiley.
- Kumar, V. (2014, May). Making freemium work. *Harvard Business Review*. Retrieved April 6, 2016, from <https://hbr.org/2014/05/making-freemium-work>
- Maddox, J. (1999, December). The unexpected science to come. *Scientific American*, 281, 62–67.
- McKeen, J. D., Guimaraes, T., & Wetherbe, J. C. (1994). A comparative analysis of MIS project selection mechanisms. *Database*, 25(2), 43–59.
- Moazed, A. (2016, May 1). What is a platform? *Applico*. Retrieved June 22, 2016, from <http://www.applico.com/blog/what-is-a-platform-business-model>
- Osterwalder, A., & Pigneur, Y. (2010). *Business model generation*. Hoboken, NJ: Wiley.
- Owyang, J., Tran, C., & Silva, C. (2013, June 4). The collaborative economy. *Altimeter*. Retrieved June 22, 2016, from <http://www.altimetergroup.com/2013/06/new-research-the-collaborative-economy-products-services-and-market-relationships-have-changed-as-sharing-startups-impact-business-models-to-avoid-disruption-companies-must-adopt-the-collaborative-economy>
- Oxford Dictionary. (2016). Sharing economy. Retrieved April 7, 2016, from <http://www.oxforddictionaries.com/definition/english/sharing-economy>
- Porter, M. E. (1979, March–April). How competitive forces shape strategy. *Harvard Business Review*, 57, 137–145.
- Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.
- Porter, M. E. (2001). Strategy and the internet. *Harvard Business Review*, 79(3), 62–78.
- Rogers, E. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Rubin, H. (2004, June 1). Real value: The elusive value of infrastructure. *CIO.com*. Retrieved June 26, 2016, from <http://www.cio.com/article/2439613/it-organization/real-value---the-elusive-value-of-infrastructure.html>

- Shank, J., & Govindarajan, V. (1993). *Strategic cost management: Three key themes for managing costs effectively*. New York: Free Press.
- Sundararajan, A. (2015, July 26). The 'gig economy' is coming. What will it mean for work? *The Guardian*. Retrieved September 22, 2016, from <https://www.theguardian.com/commentisfree/2015/jul/26/will-we-get-by-gig-economy>
- Swartz, E. (2014, September 15). The transformation of GE: From "we bring good things to life" to industrial machines in the cloud. *Metratech*. Retrieved April 7, 2016, from <http://www.metratech.com/blog/industrial-machines-in-the-cloud>
- Vitasek, K. (2012, June 12). The Rolls-Royce of effective performance-based collaboration. *Maintenance Technology*. Retrieved March 22, 2016, from <http://www.maintenancetechnology.com/2012/06/the-rolls-royce-of-effective-performance-based-collaboration>
- Wheeler, B. C. (2002). NeBIC: A dynamic capabilities theory for assessing net-enablement. *Information Systems Research*, 13(2), 125–146.
- Zuboff, S. (1988). *In the age of the smart machine: The future of work and power*. New York: Basic Books.