When Dee asked her boss for a budget to create her blog, he responded by asking the questions at the start of Chapter 2 (page 20). Using the knowledge in that chapter, she was able to respond, and he tentatively approved her budget request. Before he did so, however, he said that he wanted a memo from her on how her blog would provide a competitive advantage. He wanted that memo so that he could include it in the documentation he would use to justify the expense to his manager. The knowledge presented in this chapter will help her write that memo.
An optional Extension for this chapter is CE3, “Knowledge Management and Expert Systems.”

**Study Questions**

1. How does organizational strategy determine information systems structure?
2. What five forces determine industry structure?
3. What is competitive strategy?
4. What is a value chain?
5. How do value chains determine business processes and information systems?
6. How do information systems provide competitive advantages?

How does the knowledge in this chapter help Dee and you?
How Does Organizational Strategy Determine Information Systems Structure?

Recall from the definition of MIS that information systems exist to help organizations achieve their goals and objectives. As you will learn in your business strategy class, an organization’s goals and objectives are determined by its competitive strategy. Thus, ultimately, competitive strategy determines the structure, features, and functions of every information system.

Figure 3-1 summarizes this situation. In short, organizations examine the structure of their industry and determine a competitive strategy. That strategy determines value chains, which in turn determine business processes like those we discussed in Chapter 2. As you saw in that chapter, the nature of business processes determines the structure of an information system.

Michael Porter, one of the key researchers and thinkers in competitive analysis, developed three different models that help one understand the elements of Figure 3-1. We begin with his five forces model.

What Five Forces Determine Industry Structure?

Organizational strategy begins with an assessment of the fundamental characteristics and structure of an industry. One model used to assess an industry structure is Porter’s five forces model, shown in Figure 3-2. According to this model, five competitive forces determine industry profitability: bargaining power of customers, threat of substitutions, bargaining power of suppliers, threat of new entrants, and rivalry among existing firms. The intensity of each of the five forces determines the characteristics of the industry, how profitable it is, and how sustainable that profitability will be.

To understand this model, consider the strong and weak examples for each of the forces in Figure 3-3. A good check on your understanding is to see if you can think of different forces of each category in Figure 3-3. Also, take a particular industry—say, auto repair—and consider how these five forces determine the competitive landscape of that industry.

Organizations examine these five forces and determine how they intend to respond to them. That examination leads to competitive strategy.

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Q1 How Does Organizational Strategy Determine Information Systems Structure?

Q2 What Five Forces Determine Industry Structure?

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What Is Competitive Strategy?

An organization responds to the structure of its industry by choosing a competitive strategy. Porter followed his five forces model with the model of four competitive strategies shown in Figure 3-4.² According to Porter, a firm can engage in one of these four fundamental competitive strategies. An organization can focus on being the cost leader, or it can focus on differentiating its products from those of the competition. Further, the organization can employ the cost or differentiation strategy across an industry, or it can focus its strategy on a particular industry segment.

Consider the car rental industry, for example. According to the first column of Figure 3-4, a car rental company can strive to provide the lowest-cost car rentals across the industry, or it can seek to provide the lowest-cost car rentals to an industry segment—say, U.S. domestic business travelers.

As shown in the second column, a car rental company can seek to differentiate its products from the competition. It can do so in various ways—for example, by providing a wide range of high-quality cars, by providing the best reservations system, by having the cleanest cars or the fastest check-in, or by some other means. The company can strive to provide product differentiation across the industry or within particular segments of the industry, such as U.S. domestic business travelers.

According to Porter, to be effective, the organization’s goals, objectives, culture, and activities must be consistent with the organization’s strategy. To those in the MIS field, this means that all information systems in the organization must facilitate the organization’s competitive strategy.

What Is a Value Chain?

Organizations analyze the structure of their industry, and using that analysis, they then formulate a competitive strategy. They then need to organize and structure the organization to implement that strategy. If, for example, the competitive strategy is to be cost leader, then business activities need to be developed to be as economically advantageous as possible.

On the other hand, a business that selects a differentiation strategy would not necessarily structure itself around least-cost activities. Instead, such a business might choose to develop more costly systems, but it would do so only if those systems provided a net benefit, or margin, to the differentiation strategy. This line of thinking leads to Porter’s definition of a third model, that of value chains.

A value chain is a network of value-creating activities. Figure 3-5 shows the generic value chain model as developed by Porter. That generic chain consists of five primary activities and four support activities.

Primary Activities in the Value Chain

To understand the essence of the value chain, consider a small manufacturer—say, a bicycle maker. First, the manufacturer acquires raw materials using the in-bound logistics activity. This activity concerns the receiving and handling of raw materials and other inputs. The accumulation of those materials adds value in the sense that even a pile of unassembled parts is worth something to some customer. A collection of the parts needed to build a bicycle is worth more than
an empty space on a shelf. The value is not only the parts themselves, but also the
time required to contact vendors for those parts, to maintain business relation-
ships with those vendors, to order the parts, to receive the shipment, and so forth.

In the operations activity, the bicycle maker transforms raw materials into a
finished bicycle, a process that adds more value. Next, the company uses the out-
bound logistics activity to deliver the finished bicycle to a customer. Of course,
there is no customer to send the bicycle to without the marketing and sales value
activity. Finally, the service activity provides customer support to the bicycle users.

Each stage of this generic chain accumulates costs and adds value to the
product. The net result is the total margin of the chain, which is the difference
between the total value added and the total costs incurred. Figure 3-6 summa-
rizes the primary activities of the value chain.

Support Activities in the Value Chain

The support activities in the generic value chain contribute indirectly to the pro-
duction, sale, and service of the product. They include procurement, which con-
sists of the processes of finding vendors, setting up contractual arrangements, and
negotiating prices. (This differs from in-bound logistics, which is concerned with
ordering and receiving in accordance with agreements set up by procurement.)

Porter defined technology broadly. It includes research and development,
but it also includes other activities within the firm for developing new
techniques, methods, and procedures. He defined human resources as recruiting,
compensation, evaluation, and training of full-time and part-time employees.
Finally, firm infrastructure includes general management, finance, accounting, legal, and government affairs.

Supporting functions add value, albeit indirectly, and they also have costs. Hence, as shown in Figure 3-5, supporting activities contribute to a margin. In the case of supporting activities, it would be difficult to calculate the margin because the specific value added, say, the manufacturer’s lobbyists in Washington, D.C., is difficult to know. But there is a value added, there are costs, and there is a margin, even if it is only in concept.

Linkages in the Value Chain

Porter’s model of business activities includes linkages, which are interactions across value activities. Linkages are important sources of efficiencies and are readily supported by information systems. For example, manufacturing systems use linkages to reduce inventory costs. Such a system uses sales forecasts to plan production; it then uses the production plan to determine raw materials needs and then uses the material needs to schedule purchases. The end result is just-in-time inventory, which reduces inventory sizes and costs.

By describing value chains and their linkages, Porter started a movement to create integrated, cross-departmental business systems. Over time, Porter’s work led to the creation of a new discipline called business process design. The central idea is that organizations should not automate or improve existing functional systems. Rather, they should create new, more efficient business processes that
integrate the activities of all departments involved in a value chain. *MIS in Use 3* demonstrates some of the benefits of systems integration.

### Q5 How Do Value Chains Determine Business Processes and Information Systems?

As you learned in the last chapter, a business process is a network of activities, resources, facilities, and information that accomplish a business function. Now we can be more specific and say that business processes implement value chains or portions of value chains. Thus, each value chain consists of one or more business processes.

For example, Figure 3-7 shows a portion of the Operations value chain for a bicycle rental company. The top part of this figure shows how a company having a

<table>
<thead>
<tr>
<th>Supporting business process</th>
<th>Value Chain Activity</th>
<th>Greet Customer</th>
<th>Determine Needs</th>
<th>Rent Bike</th>
<th>Return Bike &amp; Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Cost Rental to Students</td>
<td>Message that implements competitive strategy</td>
<td>“You wanna bike?”</td>
<td>“Bikes are over there. Help yourself.”</td>
<td>“Fill out this form, and bring it to me over here when you’re done.”</td>
<td>“Show me the bike.” “OK, you owe $23.50. Pay up.”</td>
</tr>
<tr>
<td>None.</td>
<td>Physical controls and procedures to prevent bike theft.</td>
<td>Printed forms and a shoe box to store them in.</td>
<td>Shoebox with rental form.</td>
<td>Minimal credit card and cash receipt system.</td>
<td></td>
</tr>
<tr>
<td>High-Service Rental to Business Executives at Conference Resort</td>
<td>Message that implements competitive strategy</td>
<td>“Hello, Ms. Henry. Wonderful to see you again. Would you like to rent the WonderBike 4.5 that you rented last time?”</td>
<td>“You know, I think the WonderBike Supreme would be a better choice for you. It has...”</td>
<td>“Let me just scan the bike’s number into our system, and then I’ll adjust the seat for you.”</td>
<td>“How was your ride?” “Here, let me help you. I’ll just scan the bike’s tag again and have your paperwork in just a second.” “Would you like a beverage?” “Would you like me to put this on your hotel bill, or would you prefer to pay now?”</td>
</tr>
<tr>
<td>Employee training and information system to match customer and bikes, biased to “up-sell” customer.</td>
<td>Automated inventory system to check bike out of inventory.</td>
<td>Prepare payment documents.</td>
<td>Integrate with resort’s billing system.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Figure 3-7
Operations Value Chains for Bicycle Rental Companies
Chapter 3 Organizational Strategy, Information Systems, and Competitive Advantage

4. Lock in customers and buyers
5. Lock in suppliers
6. Raise barriers to market entry
7. Establish alliances
8. Reduce costs

Q6 How Do Information Systems Provide Competitive Advantages?

In your business strategy class, you will study the Porter models in greater detail than we have discussed here. When you do so, you will learn numerous ways that organizations respond to the five competitive forces. For our purposes, we can distill those ways into the list of principles shown in Figure 3-8. Keep in mind that we are applying these principles in the context of the organization's competitive strategy. (You can also apply these principles to a personal competitive advantage, as the Guide on pages 45a–45b discusses.)

Some of these competitive techniques are created via products and services, and some are created via the development of business processes. Consider each.

Competitive Advantage via Products

The first three principles in Figure 3-8 concern products or services. Organizations gain a competitive advantage by creating new products or services, by enhancing existing products or services, and by differentiating their competitive strategy of providing low-cost rentals to college students might implement this portion of its operations value chain. The bottom part shows how a company with a competitive strategy of providing high-quality rentals to business executives at a conference resort might implement this portion of that same value chain.

Note the value chain activities are the same for both companies. Both greet the customer, determine the customers' needs, rent a bike, and return the bike. However, each company implements these activities in ways that are consistent with its competitive strategy.

The low-cost vendor has created bare-bones, minimum processes to support its value chain. The high-service customer service vendor has created more elaborate business processes (supported by information systems) that are necessary to differentiate its service from that of other vendors. As Porter says, however, these processes and systems must create sufficient value that they will more than cover their costs. If not, the margin of those systems will be negative.

Before we continue, review Figure 3-1 again. The material in these first three chapters is presented from the right to the left in this figure. We began with the components of an information system in Chapter 1. We then considered business processes in Chapter 2. In this chapter, we have considered value chains, competitive strategy, and industry structure.
products and services from those of their competitors. As you think about these three principles, realize that an information system can be part of a product or it can provide support for a product or service.

Consider, for example, a car rental agency like Hertz or Avis. An information system that produces information about the car’s location and provides driving instructions to destinations is part of the car rental and thus is part of the product itself (see Figure 3-9a). In contrast, an information system that schedules car maintenance is not part of the product, but instead supports the product (Figure 3-9b). Either way, information systems can achieve the first three objectives in Figure 3-8.

The remaining five principles in Figure 3-8 concern competitive advantage created by the implementation of business processes.

**Competitive Advantage via Business Processes**

Organizations can lock in customers by making it difficult or expensive for customers to switch to another product. This strategy is sometimes called establishing high switching costs. Organizations can lock in suppliers by making it difficult to switch to another organization, or, stated positively, by making it easy to connect to and work with the organization. Finally, competitive advantage can be gained by creating entry barriers that make it difficult and expensive for new competition to enter the market.

Another means to gain competitive advantage is to establish alliances with other organizations. Such alliances establish standards, promote product awareness and needs, develop market size, reduce purchasing costs, and provide other benefits. Finally, organizations can gain competitive advantage by reducing costs. Such reductions enable the organization to reduce prices and/or to increase profitability. Increased profitability means not just greater shareholder value, but also more cash, which can fund further infrastructure development for even greater competitive advantage.

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### Figure 3-9

Two Roles for Information Systems Regarding Products

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### Daily Service Schedule — November 17, 2005

<table>
<thead>
<tr>
<th>ServiceDate</th>
<th>ServiceTime</th>
<th>VehicleID</th>
<th>Make</th>
<th>Model</th>
<th>Mileage</th>
<th>ServiceDescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/17/2005</td>
<td>12:00 AM</td>
<td>153890</td>
<td>Ford</td>
<td>Explorer</td>
<td>224</td>
<td>Std. Lubrication</td>
</tr>
<tr>
<td>11/17/2005</td>
<td>11:00 AM</td>
<td>12480</td>
<td>Toyota</td>
<td>Tacoma</td>
<td>7339</td>
<td>Std. Lubrication</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ServiceDate</th>
<th>ServiceTime</th>
<th>VehicleID</th>
<th>Make</th>
<th>Model</th>
<th>Mileage</th>
<th>ServiceDescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/17/2005</td>
<td>9:00 AM</td>
<td>12480</td>
<td>Toyota</td>
<td>Tacoma</td>
<td>7339</td>
<td>Final oil alignment import</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ServiceDate</th>
<th>ServiceTime</th>
<th>VehicleID</th>
<th>Make</th>
<th>Model</th>
<th>Mileage</th>
<th>ServiceDescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/17/2005</td>
<td>11:00 AM</td>
<td>153990</td>
<td>Ford</td>
<td>Explorer</td>
<td>224</td>
<td>Transmission oil change</td>
</tr>
</tbody>
</table>
Consider the following possibility: You work hard, earning your degree in business, and you graduate, only to discover that you cannot find a job in your area of study. You look for six weeks or so, but then you run out of money. In desperation, you take a job waiting tables at a local restaurant. Two years go by, the economy picks up, and the jobs you had been looking for become available. Unfortunately, your degree is now two years old; you are competing with students who have just graduated with fresh degrees (and fresh knowledge). Two years of waiting tables, good as you are at it, does not appear to be good experience for the job you want. You’re stuck in a nightmare—one that will be hard to get out of, and one that you cannot allow to happen.

Examine Figure 3-8 again, but this time consider those elements of competitive advantage as they apply to you personally. As an employee, the skills and abilities you offer are your personal product. Examine the first three items in the list, and ask yourself, “How can I use my time in school—and in this MIS class, in particular—to create new skills, to enhance those I already have, and to differentiate my skills from the competition?” (By the way, you will enter a national/international market. Your competition is not just the students in your class; it’s also students in classes in Ohio, California, British Columbia, Florida, New York, and every place else they’re teaching MIS today.)

Suppose you are interested in a sales job. Perhaps, like Dee, you want to sell in the pharmaceutical industry. What skills can you learn from your MIS class that will make you more competitive as a future salesperson? Ask yourself, “How does the pharmaceutical industry use MIS to gain competitive advantage?” Get on the Internet and find examples of the use of information systems in the pharmaceutical industry. How does Parke-Davis, for example, use a customer information system to sell to doctors? How can your knowledge of such systems differentiate you from your competition for a job there? How does Parke-Davis use a knowledge management system? How does the firm keep track of drugs that have an adverse effect on each other?

The fourth and fifth items in Figure 3-8 concern locking in customers, buyers, and suppliers. How can you interpret those elements of competitive advantage in terms of your personal competitive advantage? Well, to lock in, you first have to have a relationship to lock in. So do you have an internship? If not, can you get one? And once you have an internship, how can you use your knowledge of MIS to lock in your job so that you get a job offer? Does the company you are interning for have a CRM system (or any other information system that is important to the company)? If users are happy with the system, what characteristics make it worthwhile? Can you lock in a job by becoming an expert user of
this system? Becoming an expert user not only locks you into your job, but it also raises barriers to entry for others who might be competing for the job. Also, can you suggest ways to improve the system, thus using your knowledge of the company and the system to lock in an extension of your job?

Human resources personnel say that networking is one of the most effective ways of finding a job. How can you use this class to establish alliances with other students? Does your class have a Web site? Is there an email list server for the students in your class? How can you use those facilities to develop job-seeking alliances with other students? Who in your class already has a job or an internship? Can any of those people provide hints or opportunities for finding a job?

Don’t restrict your job search to your local area. Are there regions of your country where jobs are more plentiful? How can you find out about student organizations in those regions? Search the Web for MIS classes in other cities, and make contact with students there. Find out what the hot opportunities are in other cities.

Finally, as you study MIS, think about how the knowledge you gain can help you save costs for your employers. Even more, see if you can build a case that an employer would actually save money by hiring you. The line of reasoning might be that because of your knowledge of IS, you will be able to facilitate cost savings that more than compensate for your salary.

In truth, few of the ideas that you generate for a potential employer will be feasible or pragmatically useful. The fact that you are thinking creatively, however, will indicate to a potential employer that you have initiative and are grappling with the problems that real businesses have. As this course progresses, keep thinking about competitive advantage, and strive to understand how the topics you study can help you to accomplish, personally, one or more of the principles in Figure 3-8.

### DISCUSSION QUESTIONS

1. Summarize the efforts you have taken thus far to build an employment record that will lead to job offers after graduation.

2. Considering the first three principles in Figure 3-8, describe one way in which you have a competitive advantage over your classmates. If you do not have such competitive advantage, describe actions you can take to obtain one.

3. In order to build your network, you can use your status as a student to approach business professionals. Namely, you can contact them for help with an assignment or for career guidance. For example, suppose you want to work in banking and you know that your local bank has a customer information system. You could call the manager of that bank and ask him or her how that system creates a competitive advantage for the bank. You also could ask to interview other employees and go armed with the list in Figure 3-8. Describe two specific ways in which you can use your status as a student and the list in Figure 3-8 to build your network in this way.

4. Describe two ways that you can use student alliances to obtain a job. How can you use information systems to build, maintain, and operate such alliances?
All of these principles of competitive advantage make sense, but the question you may be asking is, “How do information systems help to create competitive advantage?” To answer that question, consider a sample information system.

**How Does an Actual Company Use IS to Create Competitive Advantages?**

ABC, Inc. is a worldwide shipper with sales well in excess of $1 billion. From its inception, ABC invested heavily in information technology and led the shipping industry in the application of information systems for competitive advantage. Here we consider one example of an information system that illustrates how ABC successfully uses information technology to gain competitive advantage.

ABC maintains customer account data that include not only the customer’s name, address, and billing information, but also data about the identity of that customer and the locations to which the customer ships. Figure 3-10 shows a Web form that an ABC customer is using to schedule a shipment. When the ABC system creates the form, it fills the Company name drop-down list with the names of companies that the customer has shipped to in the past. Here, the user is selecting Prentice Hall.

When the user clicks on the Company name, the underlying ABC information system reads the customer’s contact data from a database. The data consist of names, addresses, and phone numbers of recipients from past shipments. The user then selects a Contact name, and the system inserts that contact’s address and other data into the form using data from the database, as shown in Figure 3-11. Thus, the system saves customers from having to reenter data for people to whom they have shipped in the past. Providing the data in this way also reduces data-entry errors.

Figure 3-12 shows another feature of this system. On the right-hand side of this form, the customer can request that ABC send email messages to the sender (the customer), the recipient, and others as well. The customer can choose for ABC...
to send an email when the shipment is created and when it has been delivered. In Figure 3-12, the user has provided three email addresses. The customer wants all three addresses to receive delivery notification, but only the sender will receive shipment notification. The customer can add a personal message as well. By adding this capability to the shipment scheduling system, ABC has extended its product from a package-delivery service to a package-and information-delivery service.

Figure 3-13 shows one other capability of this information system. It has generated a shipping label, complete with bar code, for the user to print. By doing this, the company not only reduces errors in the preparation of shipping labels, but it also causes the customer to provide the paper and ink for document printing! Millions of such documents are printed every day, resulting in a considerable savings to the company.

Note that only customers who have access to the Internet can use this shipping system. Do organizations have an ethical obligation to provide equivalent services to those who do not have access? The Ethics Guide on pages 47a–47b explores this question.
An adage of investing is that it’s easier for the rich to get richer. Someone who has $10 million invested at 5 percent earns $500,000 per year. Another investor with $10,000 invested at that same 5 percent earns $500 per year. Every year, the disparity increases as the first investor pulls farther and farther ahead of the second.

This same adage applies to intellectual wealth as well. It’s easier for those with considerable knowledge and expertise to gain even more knowledge and expertise. Someone who knows how to search the Internet can learn more readily than someone who does not. And every year, the person with greater knowledge pulls farther and farther ahead. Intellectual capital grows in just the same way that financial capital grows.

Searching the Internet is not just a matter of knowledge, however. It’s also a matter of access. The increasing reliance on the Web for information and commerce has created a digital divide between those who have Internet access and those who do not. This divide continues to deepen as those who are connected pull farther ahead of those who are not.

Various groups have addressed this problem by making Internet access available in public places, such as libraries, community centers, and retirement homes. The Bill and Melinda Gates Foundation has given more than $262 million to public libraries for the purchase of personal computers and Internet access for them. Such gifts help, but not everyone can be served this way, and even with such access, there’s a big convenience difference between going to the library and walking across your bedroom to access the Internet—and you don’t have to stand in line.

The advantages accrue to everyone with access, every day. Do you want directions to your friend’s house? Want to know when a movie is playing at a local theater? Want to buy music, books, or tools? Want convenient access to your checking account? Want to decide whether to refinance your condo? Want to know what TCP/IP means? Use the Internet.

All of this intellectual capital resides on the Internet because businesses benefit by putting it there. It’s much cheaper to provide product support information over the Internet than on printed documents. The savings include not only the costs of printing, but also the costs of warehousing and mailing. Further, when product specifications change, the organization just changes the Web site. There is no obsolete material to dispose of and no costs for printing and distributing the revised material. Those who have Internet access gain current information faster than those who do not.

What happens to those who do not have Internet access? They fall farther and farther behind. The digital divide segregates the haves from the have-nots, creating new class structures. Such segregation is subtle, but it is segregation, nonetheless.

Do organizations have a responsibility to address this matter? If 98 percent of our market segment has Internet access, do we have a responsibility to provide
non-Internet materials to that other 2 percent? On what basis does that responsibility lie? Does a government agency have a responsibility to provide equal information to those who have Internet access and those who do not? When those who are connected can obtain information nearly instantaneously, 24/7, is it even possible to provide equal information to the connected and the unconnected?

It’s a worldwide problem. Connected societies and countries pull farther and farther ahead. How can any economy that relies on traditional mail compete with an Internet-based economy?

If you’re taking MIS, you’re already connected; you’re already one of the have-nots, and you’re already pulling ahead of the have-nots. The more you learn about information systems and their use in commerce, the faster you’ll pull ahead. The digital divide increases.

**DISCUSSION QUESTIONS**

1. Do you see evidence of a digital divide on your campus? In your hometown? Among your relatives? Describe personal experiences you’ve had regarding the digital divide.

2. Do organizations have a legal responsibility to provide the same information for nonconnected customers that they do for connected customers? If not, should laws be passed requiring organizations to do so?

3. Even if there is no current legal requirement for organizations to provide equal information to nonconnected customers, do they have an ethical responsibility to do so?

4. Are your answers to questions 2 and 3 different for government agencies than they are for commercial organizations?

5. Because it may be impossible to provide equal information, another approach for reducing the digital divide is for the government to enable nonconnected citizens to acquire Internet access via subsidies and tax incentives. Do you favor such a program? Why or why not?

6. Suppose that nothing is done to reduce the digital divide and that it is allowed to grow wider and wider. What are the consequences? How will society change?
How Does This System Create a Competitive Advantage?

Now consider the ABC shipping information system in light of the competitive advantage factors in Figure 3-8. This information system enhances an existing product because it eases the effort of creating a shipment to the customer while reducing errors. The information system also helps to differentiate the ABC package delivery product from competitors that do not have a similar system. Further, the generation of email messages when ABC picks up and delivers a package could be considered to be a new product.

Because this information system captures and stores data about recipients, it reduces the amount of customer work when scheduling a shipment. Customers will be locked in by this system: If a customer wants to change to a different shipper, he or she will need to rekey recipient data for that new shipper. The disadvantage of rekeying data may well outweigh any advantage of switching to another shipper.

This system achieves a competitive advantage in two other ways as well: First, it raises the barriers to market entry. If another company wants to develop a shipping service, it will not only have to be able to ship packages, but it will also need to have a similar information system. In addition, the system reduces costs. It reduces errors in shipping documents, and it saves ABC paper, ink, and printing costs. (Of course, to determine if this system delivers a net savings in costs, the cost of developing and operating the information system will need to be offset against the gains in reduced errors and paper, ink, and printing costs. It may be that the system costs more than the savings. Even still, it may be a sound investment if the value of intangible benefits, such as locking in customers and raising entry barriers, exceeds the net cost.)

Before continuing, review Figure 3-8. Make sure that you understand each of the principles of competitive advantage and how information systems can help achieve them. In fact, the list in Figure 3-8 probably is important enough to memorize, because you can also use it for non-IS applications. You can consider any business project or initiative in light of competitive advantage.
Knowledge of industry structure gives Dee background and perspective that will make it easier for her to communicate with her senior management. At her level of management, she is unlikely to perform an analysis of industry structure and of the five competitive forces. Managers at a level much higher than Dee's perform that analysis. Years ago, George Emerson (long deceased) must have considered these factors when he started the company. Today, Emerson is a multinational company, headquartered in London. Someone at Dee's level is unlikely to be deciding how to position the company within the worldwide pharmaceutical industry.

This knowledge does enable her, however, to understand the company's competitive strategy and to translate that strategy into her project. For example, suppose that Emerson's competitive strategy is quality differentiation across the entire pharmaceutical market. Furthermore, suppose that Emerson defines quality as meaning that it produces and sells drugs based on the very latest medical research.

If this is the case, then all business systems in Emerson must facilitate that strategy. Drug developers must seek out the most current, leading-edge researchers, production must create processes that enable the drugs to flow through their medical-testing process as quickly as possible, and the sales team must be trained, reinforced, and financially rewarded for effectively presenting the "products based on the most current research" message to customers.

Here is where Dee can directly apply knowledge from this chapter. She can build her blog to provide the latest messages, examples, techniques, and success stories for delivering that message. When one sales person succeeds with a technique, Dee can publish and broadcast that technique on the blog. With these features, she can state that her blog supports the competitive strategy by providing a cost-effective way of disseminating accurate and up-to-the-minute information to salespeople on how best to communicate the "most current" message. For more on the use of IS to manage knowledge and expertise, see Chapter Extension 3 "Knowledge Management and Expert Systems," on page 335.

Dee would document these ideas in the memo that her boss asked her to write. While she's writing that memo, she can also use the list of competitive advantage factors in Figure 3-8. In particular, her blog will help the sales team to differentiate its drugs from those of competitors and lock in their customers (help the sales force convince medical professionals they are getting products based on the most current research), and it will also help to raise barriers to market entry for new drugs or pharmaceutical companies (the need for other companies to commit resources to researching and producing the most current drugs).
Active Review

Use this Active Review to verify that you understand the material in the chapter. You can read the entire chapter and then perform the tasks in this review, or you can read the material for just one question and perform the tasks in this review for that question before moving on to the next one.

1. **How does organizational strategy determine information systems structure?**
   Diagram and explain the relationship of industry structure, competitive strategy, value chains, business systems, and information systems. Working from the bottom up, explain how the knowledge you’ve gained in these first three chapters pertains to that diagram.

2. **What five forces determine industry structure?**
   Name and briefly describe the five forces. Give your own examples of both strong and weak forces of each type similar to those in Figure 3-3.

3. **What is competitive strategy?**
   Describe four different strategies as defined by Porter. Give an example of four different companies that have implemented each of the strategies.

4. **What is a value chain?**
   How does the structure of a value chain relate to competitive strategy? Name and describe five primary value chain activities. Name and describe four support value chain activities. Explain value chain linkages.

5. **How do value chains determine business processes and information systems?**
   What is the relationship between a value chain and a business process? How do business processes relate to competitive strategy? How do information systems relate to competitive strategy? Justify the comments in the row labeled “Supporting business process” in Figure 3-7.

6. **How do information systems provide competitive advantages?**
   List and briefly describe eight principles of competitive advantage. Consider your college bookstore. List one application of each of the eight principles. Strive to include examples that involve information systems.

Is Dee herself likely to perform an analysis of industry structure for Emerson? If not, how can Dee use knowledge of the five competitive forces in building her blog? How can she use knowledge of the competitive forces in writing the memo to her boss justifying the budget for her blog?

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**Key Terms and Concepts**

- Competitive strategy 39
- Margin 40
- Switching costs 45
- Five forces model 38
- Primary activities 40
- Value chain 40
- Linkages 42
- Support activities 40

**Using Your Knowledge**

1. Apply the value chain model to a retailer such as Target (target.com). What is its competitive strategy? Describe the tasks Target must accomplish for each of the primary value chain activities. How does Target's competitive strategy...
and the nature of its business influence the general characteristics of Target's information systems?

2. Apply the value chain model to a mail-order company such as L.L. Bean (llbean.com). What is its competitive strategy? Describe the tasks L.L. Bean must accomplish for each of the primary value chain activities. How does L.L. Bean's competitive strategy and the nature of its business influence the general characteristics of its information systems?

3. Suppose you decide to start a business that recruits students for summer jobs. You will match available students with available jobs. You need to learn what positions are available and what students are available for filling those positions. In starting your business, you know you will be competing with local newspapers, “Craig’s List” (www.craigslist.org), and with your college. You will probably have other local competitors as well.
   a. Analyze the structure of this industry according to Porter’s five forces model.
   b. Given your analysis in a, recommend a competitive strategy.
   c. Describe the primary value chain activities as they apply to this business.
   d. Describe a business process for recruiting students.
   e. Describe information systems that could be used to support the business process in d.
   f. Explain how the process you describe in d and the system you describe in e reflect your competitive strategy.

4. Consider the two different bike rental companies in Figure 3-7. Think about the bikes that they rent. Clearly, the student bikes will be just about anything that can be ridden out of the shop. The bikes for the business executives, on the other hand, must be new, shiny, clean, and in tip-top shape.
   a. Compare and contrast the operations value chains of these two businesses as they pertain to the management of bicycles.
   b. Describe a business process for maintaining bicycles for both businesses.
   c. Describe a business process for acquiring bicycles for both businesses.
   d. Describe a business process for disposing of bicycles for both businesses.
   e. What roles do you see for information systems in your answers to the earlier questions? The information systems can be those you develop within your company or they can be those developed by others, such as “Craig’s List.”

5. Samantha Green owns and operates Twigs Tree Trimming Service. Samantha graduated from the forestry program of a nearby university and worked for a large landscape design firm, performing tree trimming and removal. After several years of experience, she bought her own truck, stump grinder, and other equipment and opened her own business in St. Louis, Missouri.
   Although many of her jobs are one-time operations to remove a tree or stump, others are recurring, such as trimming a tree or groups of trees every year or every other year. When business is slow, she calls former clients to remind them of her services and of the need to trim their trees on a regular basis.
   Samantha has never heard of Michael Porter nor any of his theories. She operates her business "by the seat of her pants.”
   a. Explain how an analysis of the five competitive forces could help Samantha.
b. Do you think Samantha has a competitive strategy? What competitive strategy would seem to make sense for her?
c. How would knowledge of her competitive strategy help her sales and marketing efforts?
d. Describe, in general terms, the kind of information system that she needs to support sales and marketing efforts.

6. FiredUp, Inc., is a small business owned by Curt and Julie Robards. Based in Brisbane, Australia, FiredUp manufactures and sells a lightweight camping stove called the FiredNow. Curt, who previously worked as an aerospace engineer, invented and patented a burning nozzle that enables the stove to stay lit in very high winds—up to 90 miles per hour. Julie, an industrial designer by training, developed an elegant folding design that is small, lightweight, easy to set up, and very stable. Curt and Julie manufacture the stove in their garage, and they sell it directly to their customers over the Internet and via phone.

a. Explain how an analysis of the five competitive forces could help FiredUp.
b. What does FiredUp's competitive strategy seem to be?
c. Briefly summarize how the primary value chain activities pertain to FiredUp. How should the company design these value chains to conform to its competitive strategy?
d. Describe business processes that FiredUp needs in order to implement its marketing and sales and also its service value chain activities.
e. Describe, in general terms, information systems to support your answer to question d.

Case Study 3

Bosu Balance Trainer

The Bosu balance trainer is a device for developing balance, strength, and aerobic conditioning. Invented in 1999, Bosu has become popular in leading health clubs, in athletic departments, and in homes. Bosu stands for “both sides up,” because either side of the equipment can be used for training.

Bosu is not only a new training device, but it also reflects a new philosophy in athletic conditioning that focuses on balance. According to the Bosu inventor, David Weck, “The Bosu Balance Trainer was born of passion to improve my balance. In my lifelong pursuit of enhanced athleticism, I have come to understand that balance is the foundation on which all other performance components are built.” Bosu devices are sold by Bosu.com.

Bosu devices have been successful enough that copycat products are undoubtedly on the way. For Bosu to be successful over the long term, it must transform its early market lead into a sustainable and durable market share. This means that Bosu must be used and recommended by coaches, personal trainers, and other significant purchase influencers. Bosu must develop a reputation among these market leaders as delivering significant benefits without risk of injury.

Source: Bosu, bosu.com (accessed May 2005).

Questions

1. Review the principles of competitive advantage in Figure 3-8. What information systems can Bosu create to enhance its product or differentiate it from existing and emerging competition?
2. What information systems can Bosu develop to create barriers to entry to the competition and to lock in customers?

3. What information systems can Bosu develop to establish alliances?

4. Read Case Study 2, "Customer Support and Knowledge Management at Microsoft," on page 35. (You need not answer the questions in this case; just understand how Microsoft uses newsgroups, focus groups, and MVPs.) How can Bosu develop programs similar to those used by Microsoft to provide customer support and create a competitive advantage?

5. What information systems will Bosu need to develop to support the programs identified in your answer to question 4?