Before studying this chapter you should know or, if necessary review
1. The role of the OM function in organizations, Chapter 1, pp. 3–4.
2. Differences between strategic and tactical decisions, Chapter 1, pp. 6–8.

LEARNING OBJECTIVES

After studying this chapter you should be able to
1. Define the role of business strategy.
2. Explain how a business strategy is developed.
3. Explain the role of operations strategy in the organization.
4. Explain the relationship between business strategy and operations strategy.
5. Describe how an operations strategy is developed.
6. Identify competitive priorities of the operations function.
7. Define productivity and identify productivity measures.
8. Compute productivity measures.
The role of operations strategy is to provide a plan for the operations function so that it can make the best use of its resources. Operations strategy specifies the policies and plans for using the organization’s resources to support its long-term competitive strategy. Figure 2-1 shows this relationship.

Remember that the operations function is responsible for managing the resources needed to produce the company’s products or services. Operations strategy is the plan that specifies the design and use of these resources to support the business strategy. This includes the location, size, and type of facilities available; worker skills and talents required; use of technology, special processes needed, special equipment; and quality control methods. It is the role of operations strategy to provide an overall plan for the use of all these resources. The operations strategy must be aligned with

To maintain a competitive position in the marketplace, a company must have a long-range plan. This plan needs to include the company’s long-term goals, an understanding of the marketplace, and a way to differentiate itself from its competitors. All other decisions made by the company must support this long-range plan. Otherwise, each person in the company would pursue goals that he or she considered important, and the company would quickly fall apart.

The functioning of a football team on the field is similar to the functioning of a business and provides a good example of the importance of a plan or vision. Before the plays are made, the team prepares a game strategy. Each player must perform a particular role on the team to support this strategy. The strategy is a “game plan” designed so that the team can win. Imagine what would occur if individual players decided to do plays that they thought were appropriate. Certainly the team’s chance of winning would not be very high. A successful football team is a unified group of players using their individual skills in support of a winning strategy. The same is true of a business.

The long-range plan of a business is called the business strategy. The role of each of the individual business functions, such as operations, finance, and marketing, is to find ways to best support the business strategy. Just as the players on a football team support the team’s strategy, the role of everyone in the company is to do his or her job in a way that supports the business strategy.

In today’s highly competitive, Internet-based, and global marketplace, it is more important than ever for companies to have a clear plan for achieving their goals. In this chapter we discuss the role of operations strategy, its relationship with the business strategy, and the ways in which the operations function can best support the business strategy. Because strategy is about competitiveness, we will also learn ways to measure the competitiveness of a business by measuring its productivity.

**THE ROLE OF OPERATIONS STRATEGY**

The role of operations strategy is to provide a plan for the operations function so that it can make the best use of its resources. Operations strategy specifies the policies and plans for using the organization’s resources to support its long-term competitive strategy. Figure 2-1 shows this relationship.

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**Business strategy**
A long-range plan or vision for a business.

**Operations strategy**
A long-range plan for the operations function that specifies the design and use of resources to support the business strategy.
the company’s business strategy and enable the company to achieve its long-term plan.

The Importance of Operations Strategy

Operations strategy did not come to the forefront until the 1970s. Up to that time U.S. companies emphasized mass production of standard product designs. There were no serious international competitors, and U.S. companies could pretty much sell anything they wanted to. However, that changed in the 1970s and 1980s. Japanese companies began offering products of superior quality at lower cost, and U.S. companies lost market share to their Japanese counterparts. In an attempt to survive, many U.S. companies copied Japanese approaches. Unfortunately, merely copying these approaches often proved unsuccessful; it took time to really understand Japanese approaches. It became clear that Japanese companies were more competitive because of their operations strategy; that is, all their resources were specifically designed to directly support the company’s overall strategic plan.

Harvard Business School professor Michael Porter says that companies often do not understand the differences between operational effectiveness and strategy. Operational effectiveness is the ability to perform operations tasks more efficiently than competitors. Strategy, on the other hand, is a plan for competing in the marketplace. Running a race very efficiently is an example of operational effectiveness. However, it is not enough to be efficient. Strategy is defining what race you will run in. Without strategy, you could be running efficiently in the wrong race. Operational effectiveness and strategy must be aligned; otherwise you may be very efficiently performing the wrong task. The role of operations strategy is to make sure that all the tasks performed by the operations function are the right tasks.

Now that we know the meaning of business strategy and operations strategy and their importance, let’s look at how a company would go about developing a business strategy. Then we will see how an operations strategy would be developed to support the company’s business strategy.
Mission

The first decision a company needs to make is to identify its mission. Every organization, from IBM to the Boy Scouts, has a mission. The mission is a statement that answers three overriding questions:

- **What** business will the company be in (“selling personal computers,” “operating an Italian restaurant”)?
- **Who** will the customers be, and what are the expected customer attributes (“homeowners,” “college graduates”)?
- **How** will the company’s basic beliefs define the business (“gives the highest customer service,” “stresses family values”)?

Following is a list of some well-known companies and parts of their mission statements:

- **Dell Computer Corporation:** “to be the most successful computer company in the world”
- **Delta Airlines:** “worldwide airlines choice”
- **IBM:** “translate advanced technologies into values for our customers as the world’s largest information service company”
- **Lowe’s:** “helping customers build, improve and enjoy their homes”
- **Ryder:** “offers a wide array of logistics services, such as distribution management, domestically and globally”

You can see that identifying the mission is a very important part of developing a business strategy. The mission basically defines the company. In order to develop a long-term plan for a business, you must first know exactly what business you are in, what customers you are serving, and what your company’s values are. If a company does not have a well-defined mission it may pursue business opportunities about which it has no real knowledge or that are in conflict with its current pursuits, or it may miss opportunities altogether.

For example, Dell Computer Corporation has become a leader in the computer industry in part by following its mission. If it did not follow its mission Dell might decide to pursue other opportunities, such as producing mobile telephones similar to those manufactured by Motorola and Nokia. Although there is a huge market for mobile telephones, it is not consistent with Dell’s mission of focusing on computers.

Environmental Scanning

A second factor that must be considered when developing a business strategy is the external environment in which the business is operating. This environment includes trends in the market, in the economic and political environment, and in society. These trends must be analyzed to determine business opportunities and threats. This process of monitoring the external environment is called **environmental scanning**.

To remain competitive, companies have to continuously monitor their environment...
and be prepared to change their business strategy, or long-range plan, in light of environmental changes.

**What Does Environmental Scanning Tell Us?** Environmental scanning allows a company to identify *opportunities* and *threats*. For example, through environmental scanning we could see gaps in what customers need and what competitors are doing to meet those needs. A study of these gaps could reveal an opportunity for our company, and we could design a plan to take advantage of it. On the other hand, our company may currently be a leader in its industry, but environmental scanning could reveal competitors that are meeting customer needs better—for example, by offering a wider array of services. In this case, environmental scanning would reveal a threat and we would have to change our strategy so as not to be left behind. Just because a company is an industry leader today, does not mean they will continue to be a leader in the future. In the 1970s Sears Roebuck was a retail leader, but fell behind the pack in the 1990s.

**What Do We Mean by Trends in the Environment?** The external business environment is always changing. To stay ahead of the competition, a company must constantly look out for trends or changing patterns in the environment, such as *marketplace trends*. These might include changes in customer wants and expectations, and ways in which competitors are meeting those expectations. For example, in the computer industry customers are demanding speed of delivery, high quality, and low price. Dell Computer Corporation has become a leader in the industry because of its speed of delivery and low price. Other computer giants, such as Compaq, have had to redesign their business and operations strategies to compete with Dell. Otherwise, they would be left behind. It is through environmental scanning that companies like Compaq can see trends in the market, analyze the competition, and recognize what they need to do to remain competitive.

There are many other types of trends in the marketplace. For example, we are seeing changes in the use of technology, such as point-of-scale scanners, automation, computer-assisted processing, electronic purchasing, and electronic order tracking. One rapidly growing trend is e-commerce. For retailers like the GAP, Eddie Bauer, F.A.O. Schwarz, Fruit of the Loom, Inc., Barnes & Noble, and others, e-commerce has become a significant part of their business. Victoria’s Secret has even used the Internet to conduct a fashion show in order to boost sales. Some companies began using e-commerce early in its development. Others, like Sears Roebuck, waited and then found themselves working hard to catch up to the competition.

In addition to market trends, environmental scanning looks at economic, political, and social trends that can affect the business. *Economic trends* include recession,
inflation, interest rates, and general economic conditions. Suppose that a company is considering obtaining a loan in order to purchase a new facility. Environmental scanning could show that interest rates are particularly favorable and that this may be a good time to go ahead with the purchase.

**Political trends** include changes in the political climate—local, national, and international—that could affect a company. For example, the creation of the European Union has had a significant impact on strategic planning for global companies such as IBM, Hewlett Packard, and PepsiCo. Similarly, changes in trade relations with China have opened up opportunities that were not available earlier. There has been a change in how companies view their environment—a shift from a national to a global perspective. Companies seek customers and suppliers all over the globe. Many have changed their strategies in order to take advantage of global opportunities, such as forming partnerships with international firms, called **strategic alliances**. For example, companies like Motorola and Xerox want to take advantage of opportunities in China and are developing strategic alliances to help them break into that market.

Finally, **social trends** are changes in society that can have an impact on a business. An example is the awareness of the dangers of smoking, which has made smoking less socially acceptable. This trend has had a huge impact on companies in the tobacco industry. In order to survive, many of these companies have changed their strategy to focus on customers overseas where smoking is still socially acceptable, or have diversified into other product lines.

### Core Competencies

The third factor that helps define a business strategy is an understanding of the company’s strengths. These are called **core competencies**. In order to formulate a long-term plan, the company’s managers must know the competencies of their organization. Core competencies could include special skills of workers, such as expertise in providing customized services or knowledge of information technology. Another example might be flexible facilities that can handle the production of a wide array of products. To be successful, a company must compete in markets where its core competencies will help it win. Table 2-1 shows a list of some core competencies that companies may have.

<table>
<thead>
<tr>
<th>Table 2-1 Organizational Core Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Workforce</strong></td>
</tr>
<tr>
<td>Highly trained</td>
</tr>
<tr>
<td>Responsive in meeting customer needs</td>
</tr>
<tr>
<td>Flexible in performing a variety of tasks</td>
</tr>
<tr>
<td>Strong technical capability</td>
</tr>
<tr>
<td>Creative in product design</td>
</tr>
<tr>
<td><strong>2. Facilities</strong></td>
</tr>
<tr>
<td>Flexible in producing a variety of products</td>
</tr>
<tr>
<td>Technologically advanced</td>
</tr>
<tr>
<td>An efficient distribution system</td>
</tr>
<tr>
<td><strong>3. Market Understanding</strong></td>
</tr>
<tr>
<td>Skilled in understanding customer wants and predicting market trends</td>
</tr>
<tr>
<td><strong>4. Financial Know-how</strong></td>
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<tr>
<td>Skilled in attracting and raising capital</td>
</tr>
<tr>
<td><strong>5. Technology</strong></td>
</tr>
<tr>
<td>Use of latest production technology</td>
</tr>
<tr>
<td>Use of information technology</td>
</tr>
<tr>
<td>Quality control techniques</td>
</tr>
</tbody>
</table>
Highly successful firms develop a business strategy that takes advantage of their core competencies or strengths. To see why it is important to use core competencies, think of a student developing plans for a successful professional career. Let's say that this student is particularly good at mathematics but not as good in verbal communication and persuasion. Taking advantage of core competencies would mean developing a career strategy in which the student's strengths could provide an advantage, such as engineering or computer science. On the other hand, pursuing a career in marketing would place the student at a disadvantage because of a relative lack of skills in persuasion.

Putting It Together

Figure 2-2 shows how the mission, environmental scanning, and core competencies help in the formulation of the business strategy. Note that the figure shows a dynamic, ongoing process that is constantly allowed to change. As environmental scanning reveals changes in the external environment, the company may need to change its business strategy to remain competitive while taking advantage of its core competencies and staying within its mission.

Let's look at how Dell Computer Corporation combined its mission, environmental scanning, and core competencies to develop a highly successful business strategy. Dell's mission is to “be the most successful computer company in the world at delivering the best customer experience in markets we serve. In doing so, Dell will meet customer expectations of: highest quality, leading technology, competitive pricing, individual and company accountability, best-in-class service and support, flexible customization capability, superior corporate citizenship, and financial stability.” The mission defined what business Dell is in: highest quality, leading technology, computer company. It also defined Dell’s customers: focus on markets served. Finally, it defined how Dell would do this: through competitive pricing, best-in-class service and support, flexible customization capability. You can see how this mission defines Dell as a company.

An environmental scan revealed that competing computer manufacturers, such as IBM and Compaq, used inter-
mediate resellers to sell computers. This led to higher inventory, higher costs, and slower responsiveness to customer wants. Michael Dell’s idea was to sell directly to the customer and be able to put together exactly the system the customer wanted within a short time. Dell defined its core competencies as flexible manufacturing and the latest technological offering. Together, the mission, environmental scan, and core competencies were used to develop a competitive business strategy that provides customized computer solutions to customers within 36 hours at a highly competitive price.

Dell’s business strategy was to take advantage of an opportunity in the market. However, to implement this strategy, the company needed to develop an operations strategy that arranged all the resources in ways that would support the business strategy. Operations strategy designs a plan for resources in order to take the business strategy from concept to reality. In the next section we look at how an operations strategy is developed.

Before You Go On
Make sure that you understand the role of the business strategy in defining a company’s long-term plan. Without a business strategy the company would have no overriding plan. Such a plan acts like a compass, pointing the company in the right direction. To be effective, a long-range plan must be supported by each of the business functions. The operations strategy looks at the business strategy and develops a long-range plan specifically for the operations function. In the next section we will see how the operations strategy is developed.

DEVELOPING AN OPERATIONS STRATEGY

Once a business strategy has been developed, an operations strategy must be formulated. This will provide a plan for the design and management of the operations function in ways that support the business strategy. The operations strategy relates the business strategy to the operations function. It focuses on specific capabilities of the operation that give the company a competitive edge. These capabilities are called competitive priorities. By excelling in one of these capabilities, a company can become a winner in its market. These competitive priorities and their relationship to the design of the operations function are shown in Figure 2-3.

Competitive Priorities
Operations managers must work closely with marketing in order to understand the competitive situation in the company’s market before they can determine which competitive priorities are important. There are four broad categories of competitive priorities:

1. Cost Competing based on cost means offering a product at a low price relative to the prices of competing products. The need for this type of competition emerges from the business strategy. The role of the operations strategy is to develop a plan for the use of resources to support this type of competition. Let’s look at some specific characteristics of the operations function we might find in a company competing on cost.
To develop this competitive priority, the operations function must focus primarily on cutting costs in the system, such as costs of labor, materials, and facilities. Companies that compete based on cost study their operations system carefully to eliminate all waste. They might offer extra training to employees to maximize their productivity and minimize scrap. Also, they might invest in automation in order to increase productivity. Generally, companies that compete based on cost offer a narrow range of products and product features, allow for little customization, and have an operations process that is designed to be as efficient as possible.

One company that successfully competes on cost is Southwest Airlines. Southwest’s entire operations function is designed to support this strategy. Facilities are streamlined: only one type of aircraft is used, and flight routes are generally short. This serves to minimize costs of scheduling crew changes, maintenance, inventories of parts, and many administrative costs. Unnecessary costs are completely eliminated: there are no meals, printed boarding passes, or seat assignments. Employees are trained to perform many functions and use a team approach to maximize customer service. Because of this strategy, Southwest has been a model for the airline industry for a number of years.
2. Quality
Many companies claim that quality is their top priority, and many customers say that they look for quality in the products they buy. Yet quality has a subjective meaning; it depends on who is defining it. For example, to one person quality could mean that the product lasts a long time, such as a Volvo, a car known for its longevity. To another person quality might mean high performance, such as a BMW. When companies focus on quality as a competitive priority, they are focusing on the dimensions of quality that are considered important by their customers.

Quality as a competitive priority has two dimensions. The first is *high-performance design*. This means that the operations function will be designed to focus on aspects of quality such as superior features, close tolerances, high durability, and excellent customer service. The second dimension is *product and service consistency*, which measures how often the product or service meets the exact design specifications. A good example of product consistency is McDonald’s, where we know we can get the same product every time at any location. Companies that compete on quality must deliver not only high-performance design but product and service consistency as well.

A company that competes on this dimension needs to implement quality in every area of the organization. One of the first aspects that needs to be addressed is *product design quality*, which involves making sure the product meets the requirements of the customer. A second aspect is *process quality*, which deals with designing a process to produce error-free products. This includes focusing on equipment, workers, materials, and every other aspect of the operation to make sure it works the way it is supposed to. Companies that compete based on quality have to address both of these issues: the product must be designed to meet customer needs, and the process must produce the product exactly as it is designed.

To see why product and process quality are both important, let’s say that your favorite fast-food restaurant has designed a new sandwich called the “Big Yuck.” The restaurant could design a process that produces a perfect “Big Yuck” every single time. But if customers find the “Big Yuck” unappealing, they will not buy it. The same would be true if the restaurant designed a sandwich called the “Super Delicious” to meet the desires of its customers. Even if the “Super Delicious” was exactly what the customers wanted, if the process did not produce the sandwich the way it was designed, often making it soggy and cold instead, customers would not buy it. Remember that the product needs to be designed to meet customer wants and needs, and the process needs to be designed to produce the exact product that was intended, consistently without error.

3. Time
Time or speed is one of the most important competitive priorities today. Companies in all industries are competing to deliver high-quality products in as short a time as possible. Companies like Federal Express, LensCrafters, UPS, and Dell Computer compete based on time. Today’s customers don’t want to wait, and companies that can meet their need for fast service are becoming leaders in their industries.

Making time a competitive priority means competing based on all time-related issues, such as rapid delivery and on-time delivery. Rapid delivery refers to how quickly an order is received; on-time delivery refers to the number of times deliveries are made on time. When time is a competitive priority, the job of the operations function is to critically analyze the system and combine or eliminate processes in order to save time. Often companies use technology to speed up processes, rely on a flexible workforce to meet peak demand periods, and eliminate unnecessary steps in the production process.
Federal Express, the world’s largest provider of expedited delivery services, is an example of a company that competes based on time. To support this strategy, the operation function had to be designed to promote speed. For example, bar code technology is used to speed up processing and handling, and the company uses its own fleet of airplanes. Federal Express also relies on a very flexible part-time workforce, such as college students who are willing to work a few hours at night. This allows Federal Express to cover workforce requirements during peak periods without having to schedule full-time workers.

4. **Flexibility** As a company’s environment changes rapidly, including customer needs and expectations, the ability to readily accommodate these changes can be a winning strategy. This is **flexibility**. There are two dimensions of flexibility. One is the ability to offer a wide variety of products or services and customize them to the unique needs of clients. This is called **product flexibility**. A flexible system can quickly add new products that may be important to customers or easily drop a product that is not doing well. Another aspect of flexibility is the ability to rapidly increase or decrease the amount produced in order to accommodate changes in the demand. This is called **volume flexibility**.

You can see the meaning of flexibility when you compare ordering a suit from a custom tailor to buying it off the rack at a retailer. Another example would be going to a fine restaurant and asking to have a meal made just for you, versus going to a fast-food restaurant and being limited to items on the menu. The custom tailor and the fine restaurant are examples of companies that are flexible and will accommodate customer wishes. Another example of flexibility is Empire West, Inc., a company that makes a variety of products out of plastics, depending on what customers want. Empire West makes everything from plastic trays to body guards for cars.

Companies that compete based on flexibility often cannot compete based on speed, because it generally requires more time to produce a customized product. Also, flexible companies typically do not compete based on cost, because it may take more resources to customize the product. However, flexible companies often offer greater customer service and can meet unique customer requirements. To carry out this strategy, flexible companies tend to have more general-purpose equipment that can be used to make many different kinds of products. Also, workers in flexible companies tend to have higher skill levels and can often perform many different tasks in order to meet customer needs.

**Why Not Focus on All Priorities?**

You may be wondering why the operations function needs to give special focus to some priorities and not all. Aren’t all the priorities important? The reason is that as more resources are dedicated toward one priority, fewer resources are left for others. This is called a **trade-off**. For example, our restaurant might be known for making a “home-made” pizza with the freshest ingredients. However, because of the ingredients we use, we may not be able to offer the pizza at the lowest price. Also, since we are...
making each pizza individually, we may not be able to produce pizzas very quickly. So we have had to make a trade-off.

It is important to know that any business must achieve a basic level of each of these priorities. In our pizza example, even though we are not competing based on price, we still cannot offer the pizza at such a high price that customers would not want to pay for it. Also, even though we are not competing based on time, we still have to produce the pizza within a reasonable amount of time; otherwise, customers will not be willing to wait for it.

To help us decide which competitive priorities to focus on, we can distinguish between order winners and order qualifiers. Order qualifiers are those competitive priorities that we have to meet if we want to do a business in a particular market. Order winners, on the other hand, are the competitive priorities that help us win orders in the market. Using our pizza example, order qualifiers might be low price (say, less than $10.00) and quick delivery (say, under 15 minutes), because this is a standard that has been set by competing pizza restaurants. Our order winner may be “fresh ingredients” and “home-made taste.” This may be what makes us different from all the other pizza restaurants. Knowing the order winners and order qualifiers in a particular market is critical to focusing on the right competitive priorities.

Translating Competitive Priorities into Production Requirements

Operations strategy makes the needs of the business strategy specific to the operations function by focusing on the right competitive priorities. Once the competitive priorities have been identified, a plan is developed to support those priorities. The operations strategy will specify the design and use of the organization’s resources; that is, it will set forth specific operations requirements. These can be broken down into two categories:

1. Structure—Operations decisions related to the design of the production process, such as characteristics of facilities used, selection of appropriate technology, and the flow of goods and services through the facility.
2. Infrastructure—Operations decisions related to the planning and control systems of the operation, such as the organization of the operations function, the skills and pay of workers, and quality control approaches.

Together, the structure and infrastructure of the production process determine the nature of the company’s operations function.

The structure and infrastructure of the production process must be aligned to enable the company to pursue its long-term plan. Suppose we determined that time or speed of delivery is the order winner in the marketplace and the competitive priority we need to focus on. We would then design the production process to promote speedy product delivery. This might mean having a system that does not necessarily produce the product at the absolutely lowest cost, possibly because we need costlier or extra equipment to help us focus on speed. The important thing is that every aspect of production of a product or delivery of a service needs to focus on supporting the competitive priority. However, we cannot neglect the other competitive priorities. A certain level of order qualifiers must be achieved just to remain in the market. The issue is not one of focusing on one priority to the exclusion of the others. Rather, it is a matter of degree.

Let’s return to the example of Dell Computer Corporation. Earlier we explained how Dell used its mission, environmental scanning, and core competencies to develop its business strategy. But to make this business plan a reality, the company
needed to develop an operations strategy to create its structure and infrastructure. The focus was on customer service, cost, and speed. Dell set up a system in which customers could order computers directly from the company, without going through an intermediary, such as a retailer. An operations system was designed so that ordering of components and assembly of computers did not occur until an order was actually placed. This kept costs low because Dell did not have computers sitting in inventory. A warehousing system was designed so that when components were needed, suppliers would deliver them to the plant within 15 minutes; in contrast, competitors like IBM and Compaq must wait hours or even days to receive needed components. To further increase speed, Dell set up a shipping arrangement with United Parcel Service (UPS). With this structure and infrastructure, Dell was able to implement its business plan.

Before You Go On

By now you should have a clear understanding of how an operations strategy is developed and its role in helping the organization decide which competitive priorities to focus on. There are four categories of competitive priorities: cost, quality, time, and flexibility. A company must make trade-offs in deciding which priorities to focus on. The operations strategy and the competitive priorities dictate the design and plan for the operations function, which includes the structure and infrastructure of the operation. This is a dynamic process, and as the environment changes, the organization must be prepared to change accordingly. Operations strategy plays a key role in an organization’s ability to compete. In the next section we discuss a way to measure a company’s competitive capability.

A sound business strategy and supporting operations strategy make an organization more competitive in the marketplace. But how does a company measure its competitiveness? One of the most common ways is by measuring productivity. In this section we will look at how to measure the productivity of each of a company’s resources as well as the entire organization.

Measuring Productivity

Recall that operations management is responsible for managing the transformation of many inputs into outputs, such as products or services. A measure of how efficiently inputs are being converted into outputs is called productivity. Productivity measures how well resources are used. It is computed as a ratio of outputs (goods and services) to inputs (e.g., labor and materials). The more efficiently a company uses its resources, the more productive it is:

\[
\text{Productivity} = \frac{\text{output}}{\text{input}} \quad (2-1)
\]

We can use this equation to measure the productivity of one worker or many, as well as the productivity of a machine, a department, the whole firm, or even a nation. The possibilities are shown in Table 2-2.

When we compute productivity for all inputs, such as labor, machines, and capital, we are measuring total productivity. Total productivity describes the productivity of an entire organization. For example, let’s say that the weekly dollar value of a company’s output, such as finished goods and work in progress, is $8,600 and that the
value of its inputs, such as labor, materials, and capital is $10,200. The company’s total productivity would be computed as follows:

\[
\text{Total productivity} = \frac{\text{output}}{\text{input}} = \frac{\$8,600}{\$10,200} = .84
\]

Often it is much more useful to measure the productivity of one input variable at a time in order to identify how efficiently each is being used. When we compute productivity as the ratio of output relative to a single input, we obtain a measure of partial productivity. Following are two examples of the calculation of partial productivity:

1. Our new cookie oven produced 346 cookies in 4 hours. What is its productivity?

   Machine productivity = \(\frac{\text{number of cookies}}{\text{oven time}}\)
   
   \[= \frac{346 \text{ cookies}}{4 \text{ hours}} = 86.5 \text{ cookies/hour}\]

2. We hired two new workers to paint small tables in our furniture shop. If the workers painted 22 tables in 8 hours, what was their productivity?

   Labor productivity = \(\frac{\text{number of tables}}{\text{number of workers} \times \text{hours}}\)
   
   \[= \frac{22 \text{ tables}}{2 \text{ workers} \times 8 \text{ hours}} = 1.4 \text{ tables/hour}\]

Sometimes we need to compute productivity as the ratio of output relative to a group of inputs, such as labor and materials. This is a measure of multifactor productivity. For example, let’s say that output is worth $382 and labor and materials costs are $168 and $98, respectively. A multifactor productivity measure of our use of labor and materials would be

\[
\text{Multifactor productivity} = \frac{\text{output}}{(\text{labor + materials})} = \frac{\$382}{($168 + $98)} = 1.43
\]

**Interpreting Productivity Measures**

To interpret the meaning of a productivity measure, it must be compared with a similar productivity measure. For example, if one worker at a pizza shop produces 17 pizzas in 2 hours, the productivity of that worker is 8.5 pizzas per hour. This number by itself does not tell us very much. However, if we compare it to the productivity of two other workers, one who produces 7.2 pizzas per hour and another 6.8 pizzas per hour, it is much more meaningful. We can see that the first worker is much more productive than the other two workers. But how do we know whether the productivity of all
three workers is reasonable? What we need is a standard. In Chapter 11 we will discuss ways to set standards and how those standards can help in evaluating the performance of our workers.

It is also helpful to measure and compare productivity over time. Let’s say that we want to measure the total productivity of our three pizza makers (our “labor”) and we compute a labor productivity measure of 7.5 pizzas per hour. This number does not tell us much about the workers’ performance. However, if we compared our weekly productivity measures for the last four weeks, we would get much more information:

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>5.4</td>
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Now we can see that the workers’ productivity is improving over time. But what if we find out that our main competitor, a pizzeria down the street, has a productivity of 9.5 pizzas per labor hour? Suddenly we know that even though our productivity is going up, it should be much higher. We will have to analyze how we are making pizzas and increase our productivity in order to be competitive. By comparing our productivity over time and against similar operations, we have a much better sense of how high our productivity really is.

When evaluating productivity and setting standards for performance, we also need to consider our strategy for competing in the marketplace—namely, our competitive priorities. A company that competes based on speed would probably measure productivity in units produced over time. However, a company that competes based on cost might measure productivity in terms of costs of inputs such as labor, materials, and overhead. The important thing is that our productivity measure provides information on how we are doing relative to the competitive priority that is most important to us.

**OM ACROSS THE ORGANIZATION**

The business strategy defines the long-range plan for the entire company and guides the actions of each of the company’s business functions. Those functions, in turn, develop plans to support the business strategy. However, in defining their individual strategies, it is important for the functions to work together and understand each other’s needs.

**Marketing** identifies target markets, studies competition, and communicates with customers. In developing its own strategy, marketing needs to fully understand the capabilities of the operations function, the types of resources being used, and the way those resources are utilized. Otherwise, marketing’s strategy could entail making promises that operations cannot deliver. In turn, marketing needs to communicate to operations all observed and anticipated market changes.

**Finance** develops financial plans to support the business strategy. However, since it is the operations function that manages all the organization’s resources, the financial plans in effect support operations activities. Before it can develop its own strategy, finance needs to communicate with operations in order to understand the financial requirements of planned resources. In turn, operations managers cannot fully develop a strategy until they have a clear understanding of financial capabilities.

The strategies of all the business functions need to support each other in achieving the goals set by the business strategy, and are best developed through a team approach.
This chapter has focused on competitiveness and winning in the marketplace. But how does this apply to everyday life? Let’s look first at the notion of strategy. Most of us have a personal strategy similar to a business strategy; that is, we have a long-range plan that governs the things we do. This personal strategy is based on our personal mission, our understanding of the environment we live and work in, and our core competencies or strengths. Since you are reading this book, you are probably a student in an operations management course. Your personal strategy is probably to have a successful career in business. Let’s see how implementing the concept of operations strategy can help in everyday life.

Figure 2-4 shows the development of our personal strategy and its relationship to our "functional" strategies. In developing our personal strategy, we first have to consider our mission, which defines us and our core beliefs (e.g., “ethics in business rules” versus “win at all cost”). We also consider our strengths or core competencies (e.g., “excellent writer” versus “winning technical skills”). Finally, we have to study the environment for job opportunities and market trends (e.g., “growing opportunities in operations management”).

Once we have developed our personal strategy, we focus on the strategies for each “function” in order to support the strategy. Our “finance strategy” is to develop a plan to finance our college education. Our “marketing strategy” is to develop a plan to sell our skills through networking, working with the university’s employment office, and constantly monitoring the market for new job opportunities and skills required. As far as our “operations strategy” is concerned, it is not only to attend classes and study hard but also to make decisions about electives and activities that will make us more competitive. These could include joining student chapters of professional organizations or an internship program to gain experience.

In developing our “operations strategy” we also have to make trade-offs, such as deciding whether to take more courses and focus on speed or take fewer courses and...
focus on quality. Our decision has to do with our personal strategy as well as the information provided by the other functional strategies. “Finance” might say that we need to focus on speed and finish school quickly. “Marketing” might say that we need to focus on quality, but that current job opportunities are excellent and we should hurry to take advantage of them. “Operations,” on the other hand, might say that we cannot get through school that fast and that “finance” may need to develop a new plan and “marketing” should be looking for future opportunities.

In this example you can see that managing the complexities of a career is not too different from managing the complexities of a business. We have to consider many “functional” strategies in order to carry out our personal strategy. If these plans do not work together, we may run out of money or pursue a career that has poor job prospects. An organization works in much the same way, and the strategies must work together if the company is to meet its goals. Finally, just as a business needs a strategy to succeed in the long run, so does a person’s career. Without a plan, a student can take courses randomly only to find that after years of schooling he or she still does not have a degree. A plan is needed to run a successful career as well as a successful business.

CHAPTER HIGHLIGHTS

1. A business strategy is a long-range plan and vision for a business. Each of the individual business functions needs to support the business strategy.
2. An organization develops its business strategy by doing environmental scanning and considering its mission and its core competencies.
3. The role of operations strategy is to provide a long-range plan for the use of the company’s resources.
4. The role of business strategy serves as an overall guide for the development of the organization’s operations strategy.
5. The operations strategy focuses on developing specific capabilities called competitive priorities. In designing its operation, an organization is governed by the operations strategy and the specific competitive priorities it has chosen to develop.
6. There are four categories of competitive priorities: cost, quality, time, and flexibility.
7. Productivity is a measure that indicates how effectively an organization is using its resources.
8. It is computed as the ratio of organizational outputs divided by inputs.

KEY TERMS

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<td>partial productivity</td>
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<td>multifactor productivity</td>
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FORMULA REVIEW

Productivity = \frac{\text{output}}{\text{input}}
### SOLVED PROBLEMS

1. Bluegill Furniture is a small furniture shop that focuses on making kitchen chairs. The weekly dollar value of its output, including finished goods and work in progress, is $14,280. The value of inputs, such as labor, materials, and capital is approximately $16,528. Compute the total productivity measure for Bluegill Furniture.

**Solution**

Total productivity = \( \frac{\text{output}}{\text{input}} = \frac{14,280}{16,528} = 0.864 \)

2. Bluegill has just purchased a new sanding machine that processes 17 chairs in 8 hours. What is the productivity of the sanding machine?

**Solution**

Machine productivity = \( \frac{\text{number of chairs}}{\text{processing time}} = \frac{17\ \text{chairs}}{8\ \text{hours}} = 2.125\ \text{chairs/hour} \)

3. Bluegill has hired two new workers to paint chairs. They have painted 10 chairs in 4 hours. What is their productivity?

**Solution**

Labor productivity = \( \frac{10\ \text{chairs}}{2\ \text{workers} \times 4\ \text{hours}} = 1.25\ \text{chairs/hour} \)

### DISCUSSION QUESTIONS

1. Explain the importance of a business strategy.
2. Explain the role of operations strategy in a business.
3. Describe how a business strategy is developed.
4. Describe how an operations strategy is formulated from the business strategy.
5. Explain what is meant by the term competitive priority and describe the four categories of competitive priorities discussed in the chapter.
6. Find an example of a company that makes quality its competitive priority. Find another company that makes time its competitive priority. Compare these strategies.
7. What is meant by the terms order qualifiers and order winners? Explain why they are important.
8. Describe the meaning of productivity. Why is it important?
9. Explain the three types of productivity measures.

### PROBLEMS

1. Two workers have the job of placing plastic labels on packages before the packages are shipped out. The first worker can place 1000 labels in 30 minutes. The second worker can place 850 labels in 20 minutes. Which worker is more productive?

2. Last week a painter painted 3 houses in 5 days. This week she painted 2 houses in 4 days. In which week was the painter more productive?

3. One type of bread-making machine can make 6 loaves of bread in 5 hours. A new model of the machine can make 4 loaves in 2 hours. Which model is more productive?

4. A company that makes kitchen chairs wants to compare productivity at two of its facilities. At facility #1, 6 workers produced 240 chairs. At facility #2, 4 workers produced 210 chairs, during the same time period. Which facility was more productive?

5. A painter is considering using a new high-tech paint roller. Yesterday he was able to paint 3 walls in 45 minutes using his old method. Today he painted 2 walls of the same size in 20 minutes. Is the painter more productive using the new paint roller?

6. Aztec Furnishings makes hand-crafted furniture for sale in its retail stores. The furniture maker has recently installed a new assembly process, including a new sander and polisher. With this new system, production has increased to 90 pieces of furniture per day from the previous 60 pieces of furniture per day. The number of defective items produced has dropped from 10 pieces per day to 1 per day. The production facility operates strictly eight hours per day. Evaluate the change in productivity for Aztec using the new assembly process.

7. Howard Plastics produces plastic containers for use in the food packaging industry. Last year their average monthly
production included 20,000 containers produced using one shift 5 days a week with an 8-hour-a-day operation. Of the items produced 15% were deemed defective. Recently Howard Plastics has implemented new production methods and new quality improvement program. Their monthly production has increased to 25,000 containers with 9% defective.

(a) Compute productivity ratios for the old and new production system.

(b) Compare the changes in productivity between the two production systems.

8. Med-Tech labs is a facility that provides medical tests and evaluations for patients, ranging from analyzing blood samples to performing magnetic resonance imaging (MRI). Average cost to patients is $60 per patient. Labor costs average $15.00 per patient, materials costs are $20.00 per patient, and overhead costs are averaged at $20.00 per patient.

(a) What is the multifactor productivity ratio for Med-Tech?
(b) What does your finding mean?

CASE: Prime Bank of Massachusetts

Prime Bank of Massachusetts was started in 1964 with James Rogers as CEO and now Chairman of the Board. Prime Bank had been growing steadily since its beginning and has developed a loyal customer following. Today there are 45 bank locations throughout Massachusetts, with corporate headquarters in Newbury, Massachusetts. The bank offers a wide array of banking services to commercial and non-commercial customers.

Prime Bank has considered itself to be a conservative, yet innovative organization. Its locations are open Monday–Friday 9–4 and Saturday 9–12. Most of the facilities are located adjacent to well-established shopping centers, with multiple ATM machines and at least three drive-through windows. However, Prime Bank’s growth has brought on certain problems. Having the right amount of tellers available in the bank as well as in the drive-through window has been a challenge. Some commercial customers had recently expressed frustration due to long waiting time. Also, the parking lot has often become crowded during peak periods.

While Prime Bank was going through a growth period, the general banking industry had been experiencing tougher competition. Competitors were increasingly offering lower interest rates on loans with higher yields on savings accounts and certificates of deposit. Also, Prime Bank was experiencing growing pains, and something needed to be done soon or they would begin losing customers to competition.

The Board, headed by James Rogers, decided to develop a more aggressive strategy for Prime Bank. While many of their competitors were competing on cost, the Board decided that Prime Bank should focus on customer service in order to differentiate itself from the competition. The Bank had already begun moving in that direction by offering a 24-hour customer service department to answer customers’ banking questions. Yet, there were difficulties with this effort, such as poor staffing and not enough telephone lines. James Rogers wanted Prime Bank to aggressively solve all customer service issues, such as staffing, layout, and facilities. He also wanted greater creativity in adding improvements in customer service, such as on-line banking, and special services for large customers. He believed that improving most aspects of the Bank’s operation would give them a competitive advantage.

The Board presented their new strategy to Victoria Chen, Vice President of Operations. Victoria had recently been promoted to the V.P. level and understood the importance of operations management. She was asked to identify all changes that should be made in the operation function that would support this new strategy and present them at the next board meeting. Victoria had been hoping for an opportunity to prove herself since she began with the bank. This was her chance.

Case Questions:

1. Why is the operations function important in implementing the strategy of an organization? Explain why the changes put in place by Victoria Chen and her team could either hurt or help the Bank.

2. Develop a list of changes for the operations function that should be considered by the Bank. Begin by identifying operations management decisions that would be involved in operating a bank, e.g. layout of facility, staff, drive-through service. Then identify ways that they can be improved at Prime Bank in order to support the strategy focused on customer service?

3. Think of the improvements identified in answering question #2. How different would these improvements be if the Bank had a strategy of cutting cost rather than supporting customer service?
INTERACTIVE LEARNING

Enhance and test your knowledge of Chapter 2 using the interactive CD.

1. Video The Walt Disney Company


2. Company Tour
   The Boeing Company
   Sensenich Propeller Manufacturing Company

3. Additional Web Resources
   Association for Manufacturing Excellence, www.ame.org

4. INTERNET CHALLENGE Understanding Strategic Differences

Select two companies in the same industry, either in service or manufacturing. You can select industries such as fast food, banking, health care, computer manufacturing, or auto manufacturing. Use the Internet to visit the selected companies’ Web sites and collect the following information: their mission statement, target market, and specifics of their product and service offerings. Explain the differences between the companies’ business strategies and target markets. How do their product and service offerings differ relative to their target markets and their overall strategies? Finally, how does their operations function support their business strategies? Try to explain how operations utilizes specific organizational resources to support the business strategy.

   Web sites to consider:
   www.lhcargo.com (Lufthansa Cargo)
   www.ualcargo.com (United Airlines Cargo)

BIBLIOGRAPHY


