

# 2

## CHAPTER

# Competitiveness, Strategy, and Productivity

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### LEARNING OBJECTIVES

After completing this chapter, you should be able to:

- L02.1** List several ways that business organizations compete.
- L02.2** Name several reasons that business organizations fail.
- L02.3** Define the terms *mission* and *strategy* and explain why they are important.
- L02.4** Discuss and compare organization strategy and operations strategy and explain why it is important to link the two.
- L02.5** Describe and give examples of time-based strategies.
- L02.6** Define the term *productivity* and explain why it is important to organizations and to countries.
- L02.7** Describe several factors that affect productivity.



This chapter discusses competitiveness, strategy, and productivity, three separate but related topics that are vitally important to business organizations. *Competitiveness* relates to the effectiveness of an organization in the marketplace relative to other organizations that offer similar products or services. Operations and marketing have a major impact on competitiveness. *Strategy* relates to the plans that determine how an organization pursues its goals. Operations strategy is particularly important in this regard. *Productivity* relates to the effective use of resources, and it has a direct impact on competitiveness. Operations management is chiefly responsible for productivity.

#### THE COLD HARD FACTS

*The name of the game is competition. The playing field is global. Those who understand how to play the game will succeed; those who don't are doomed to failure. And don't think the game is just companies competing with each other. In companies that have multiple factories or divisions producing the same good or service, factories or divisions sometimes find themselves competing with each other. When a competitor—another company or a sister factory or division in the same company—can turn out products better, cheaper, and faster, that spells real trouble for the factory or division that is performing at a lower level. The trouble can be layoffs or even a shutdown if the managers can't turn things around. The bottom line? Better quality, higher productivity, lower costs, and the ability to quickly respond to customer needs are more important than ever, and the bar is getting higher. Business organizations need to develop solid strategies for dealing with these issues.*

## 2.1 INTRODUCTION

In this chapter you will learn about the different ways companies compete and why some firms do a very good job of competing. You will learn how effective strategies can lead to competitive organizations, and you will learn what productivity is, why it is important, and what organizations can do to improve it.

**L02.1** List several ways that business organizations compete.

**Competitiveness** How effectively an organization meets the wants and needs of customers relative to others that offer similar goods or services.

## 2.2 COMPETITIVENESS

Companies must be competitive to sell their goods and services in the marketplace. **Competitiveness** is an important factor in determining whether a company prospers, barely gets by, or fails. Business organizations compete through some combination of price, delivery time, and product or service differentiation.

Marketing influences competitiveness in several ways, including identifying consumer wants and needs, pricing, and advertising and promotion.

1. **Identifying consumer wants and/or needs** is a basic input in an organization's decision-making process, and central to competitiveness. The ideal is to achieve a perfect match between those wants and needs and the organization's goods and/or services.
2. **Price and quality** are key factors in consumer buying decisions. It is important to understand the trade-off decision consumers make between price and quality.
3. **Advertising and promotion** are ways organizations can inform potential customers about features of their products or services, and attract buyers.

Operations has a major influence on competitiveness through product and service design, cost, location, quality, response time, flexibility, inventory and supply chain management, and service. Many of these are interrelated.

1. **Product and service design** should reflect joint efforts of many areas of the firm to achieve a match between financial resources, operations capabilities, supply chain capabilities, and consumer wants and needs. Special characteristics or features of a product or service can be a key factor in consumer buying decisions. Other key factors include **innovation** and the **time-to-market** for new products and services.
2. **Cost** of an organization's output is a key variable that affects pricing decisions and profits. Cost-reduction efforts are generally ongoing in business organizations. **Productivity** (discussed later in the chapter) is an important determinant of cost. Organizations with higher productivity rates than their competitors have a competitive cost advantage. A company may outsource a portion of its operation to achieve lower costs, higher productivity, or better quality.
3. **Location** can be important in terms of cost and convenience for customers. Location near inputs can result in lower input costs. Location near markets can result in lower transportation costs and quicker delivery times. Convenient location is particularly important in the retail sector.
4. **Quality** refers to materials, workmanship, design, and service. Consumers judge quality in terms of how well they think a product or service will satisfy its intended purpose. Customers are generally willing to pay more for a product or service if they perceive the product or service has a higher quality than that of a competitor.
5. **Quick response** can be a competitive advantage. One way is quickly bringing new or improved products or services to the market. Another is being able to quickly deliver existing products and services to a customer after they are ordered, and still another is quickly handling customer complaints.
6. **Flexibility** is the ability to respond to changes. Changes might relate to alterations in design features of a product or service, or to the volume demanded by customers, or the mix of products or services offered by an organization. High flexibility can be a competitive advantage in a changeable environment.
7. **Inventory management** can be a competitive advantage by effectively matching supplies of goods with demand.
8. **Supply chain management** involves coordinating internal and external operations (buyers and suppliers) to achieve timely and cost-effective delivery of goods throughout the system.
9. **Service** might involve after-sale activities customers perceive as value-added, such as delivery, setup, warranty work, and technical support. Or it might involve extra attention while work is in progress, such as courtesy, keeping the customer informed, and



*Indian operators take calls at Quatro call center in Gurgaon on the outskirts of New Delhi. Companies take advantage of communications and software support offshore to drive down costs. This industry in India already provides over one million jobs.*

attention to details. **Service quality** can be a key differentiator; and it is one that is often sustainable. Moreover, businesses rated highly by their customers for service quality tend to be more profitable, and grow faster, than businesses that are not rated highly.

10. **Managers and workers** are the people at the heart and soul of an organization, and if they are competent and motivated, they can provide a distinct competitive edge by their skills and the ideas they create. One often overlooked skill is answering the telephone. How complaint calls or requests for information are handled can be a positive or a negative. If a person answering is rude or not helpful, that can produce a negative image. Conversely, if calls are handled promptly and cheerfully, that can produce a positive image and, potentially, a competitive advantage.

## Why Some Organizations Fail

Organizations fail, or perform poorly, for a variety of reasons. Being aware of those reasons can help managers avoid making similar mistakes. Among the chief reasons are the following:

1. Neglecting operations strategy.
2. Failing to take advantage of strengths and opportunities, and/or failing to recognize competitive threats.
3. Putting too much emphasis on short-term financial performance at the expense of research and development.
4. Placing too much emphasis on product and service design and not enough on process design and improvement.
5. Neglecting investments in capital and human resources.
6. Failing to establish good internal communications and cooperation among different functional areas.
7. Failing to consider customer wants and needs.

The key to successfully competing is to determine what customers want and then directing efforts toward meeting (or even exceeding) customer expectations. Two basic issues must be addressed. First: What do the customers want? (Which items on the preceding list of the ways business organizations compete are important to customers?) Second: What is the best way to satisfy those wants?

Operations must work with marketing to obtain information on the relative importance of the various items to each major customer or target market.

Understanding competitive issues can help managers develop successful strategies.

**L02.2** Name several reasons that business organizations fail.



## 2.3 MISSION AND STRATEGIES

**L02.3** Define the terms *mission* and *strategy* and explain why they are important.

**Mission** The reason for the existence of an organization.

**Mission statement** States the purpose of an organization.

**Goals** Provide detail and scope of the mission.

**Strategies** Plans for achieving organizational goals.

An organization's **mission** is the reason for its existence. It is expressed in its **mission statement**. For a business organization, the mission statement should answer the question "What business are we in?" Missions vary from organization to organization, depending on the nature of their business. Table 2.1 provides several examples of mission statements.

A mission statement serves as the basis for organizational **goals**, which provide more detail and describe the scope of the mission. The mission and goals often relate to how an organization wants to be perceived by the general public, and by its employees, suppliers, and customers. Goals serve as a foundation for the development of organizational strategies. These, in turn, provide the basis for strategies and tactics of the functional units of the organization.

Organizational strategy is important because it guides the organization by providing direction for, and alignment of, the goals and **strategies** of the functional units. Moreover, strategies can be the main reason for the success or failure of an organization.

There are three basic business strategies:

- Low cost.
- Responsiveness.
- Differentiation from competitors.

### IS IT A STRATEGIC, TACTICAL, OR OPERATIONAL ISSUE?

Sometimes the same issue may apply to all three levels. However, a key difference is the time frame. From a strategic perspective,

long-term implications are most relevant. From tactical and operational perspectives, the time frames are much shorter. In fact, the operational time frame is often measured in days.

Responsiveness relates to ability to respond to changing demands. Differentiation can relate to product or service features, quality, reputation, or customer service. Some organizations focus on a single strategy while others employ a combination of strategies. One company that has multiple strategies is Amazon.com. Not only does it offer low cost and quick, reliable deliveries, it also excels in customer service.

*Amazon's service helped propel the company to double-digit sales. Amazon started same-day shipping in major cities, launched a program to urge manufacturers to drop frustrating packaging, and extended its service reach by acquiring free-shipping pioneer Zappos.com.*



**TABLE 2.1**

Selected portions of company mission statements

<b>Microsoft</b>	To help people and businesses throughout the world to realize their full potential.
<b>Verizon</b>	To help people and businesses communicate with each other.
<b>Starbucks</b>	To inspire and nurture the human spirit—one cup and one neighborhood at a time.
<b>U.S. Dept. of Education</b>	To promote student achievement and preparation for global competitiveness and fostering educational excellence and ensuring equal access.



Amazon received the top spot in customer service in a recent *BusinessWeek* ranking. Although most Amazon customers never talk with an employee, when something goes wrong, Amazon excels in dealing with the problem. In one case, when a New Jersey woman received a workbook she ordered that was described as “like new,” she was surprised to discover that it wasn’t even close to new—worksheets had already been filled in. She complained to the merchant but didn’t get a response. Then she complained to Amazon. She promptly received a refund, even

though she had paid the merchant, not Amazon. And she wasn’t asked to return the book.

Amazon sees its customer service as a way to enhance customer experience, and as a way to identify potential problems with merchants. In fact, if merchants have problems with more than 1 percent of their orders, that can get them removed from the site.

Source: Based on “How Amazon Aims to Keep You Clicking,” *BusinessWeek*, March 2009, p. 34.

## Strategies and Tactics

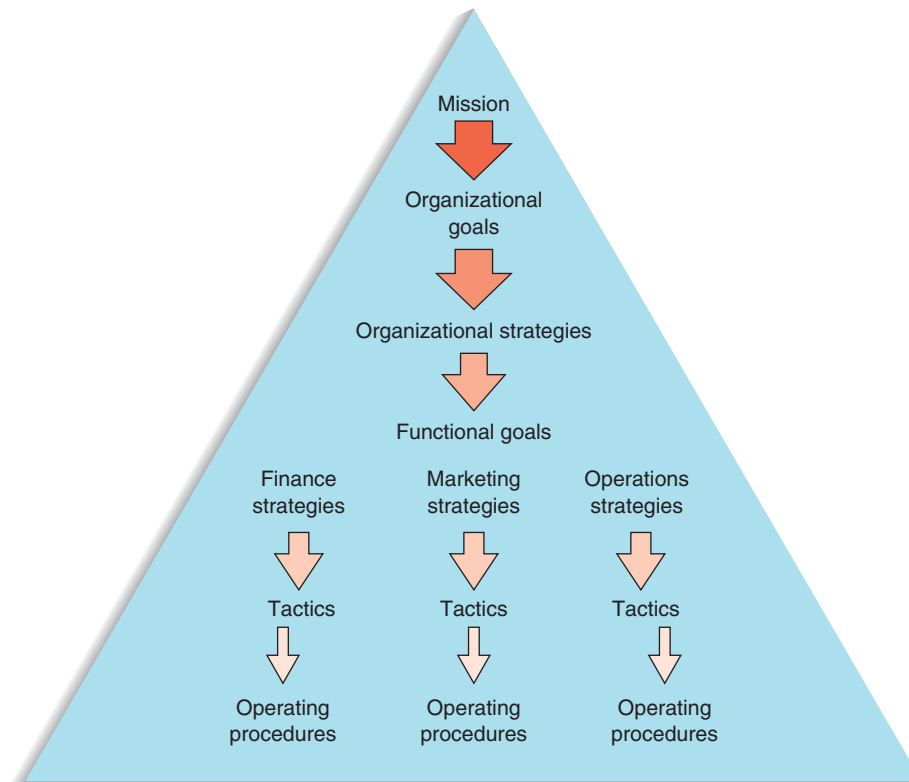
If you think of goals as destinations, then strategies are the roadmaps for reaching the destinations. Strategies provide *focus* for decision making. Generally speaking, organizations have overall strategies called *organizational strategies*, which relate to the entire organization. They also have *functional strategies*, which relate to each of the functional areas of the organization. The functional strategies should support the overall strategies of the organization, just as the organizational strategies should support the goals and mission of the organization.

**Tactics** are the methods and actions used to accomplish strategies. They are more specific than strategies, and they provide guidance and direction for carrying out actual *operations*, which need the most specific and detailed plans and decision making in an organization. You might think of tactics as the “how to” part of the process (e.g., how to reach the destination, following the strategy roadmap) and operations as the actual “doing” part of the process. Much of this book deals with tactical operations.

It should be apparent that the overall relationship that exists from the mission down to actual operations is *hierarchical*. This is illustrated in Figure 2.1.

A simple example may help to put this hierarchy into perspective.

**Tactics** The methods and actions taken to accomplish strategies.



**FIGURE 2.1**

Planning and decision making are hierarchical in organizations

## EXAMPLE 1

Rita is a high school student in Southern California. She would like to have a career in business, have a good job, and earn enough income to live comfortably.

A possible scenario for achieving her goals might look something like this:

Mission: Live a good life.

Goal: Successful career, good income.

Strategy: Obtain a college education.

Tactics: Select a college and a major; decide how to finance college.

Operations: Register, buy books, take courses, study.

Here are some examples of different strategies an organization might choose from:

**Low cost.** Outsource operations to third-world countries that have low labor costs.

**Scale-based strategies.** Use capital-intensive methods to achieve high output volume and low unit costs.

**Specialization.** Focus on narrow product lines or limited service to achieve higher quality.

**Newness.** Focus on innovation to create new products or services.

**Flexible operations.** Focus on quick response and/or customization.

**High quality.** Focus on achieving higher quality than competitors.

**Service.** Focus on various aspects of service (e.g., helpful, courteous, reliable, etc.).

**Sustainability.** Focus on environmental-friendly and energy-efficient operations.

A wide range of business organizations are beginning to recognize the strategic advantages of sustainability, not only in economic terms, but also in promotional benefit by publicizing their sustainability efforts and achievements.

Sometimes organizations will combine two or more of these or other approaches into their strategy. However, unless they are careful, they risk losing focus and not achieving advantage in any category. Generally speaking, strategy formulation takes into account the way organizations compete and a particular organization's assessment of its own strengths and weaknesses in order to take advantage of its **core competencies**—those special attributes or abilities possessed by an organization that give it a *competitive edge*.

The most effective organizations use an approach that develops core competencies based on customer needs as well as on what the competition is doing. Marketing and operations work closely to match customer needs with operations capabilities. Competitor competencies are important for several reasons. For example, if a competitor is able to supply high-quality products, it may be necessary to meet that high quality as a baseline. However, merely *matching* a competitor is usually not sufficient to gain market share. It may be necessary to exceed the quality level of the competitor or gain an edge by excelling in one or more other dimensions, such as rapid delivery or service after the sale. Walmart, for example, has been very successful in managing its supply chain, which has contributed to its competitive advantage.

To be effective, strategies and core competencies need to be aligned. Table 2.2 lists examples of strategies and companies that have successfully employed those strategies.

## Strategy Formulation

Strategy formulation is almost always critical to the success of a strategy. Walmart discovered that when it opened stores in Japan. Although Walmart thrived in many countries on its reputation for low-cost items, Japanese consumers associated low cost with low quality, causing Walmart to rethink its strategy in the Japanese market. And many felt that Hewlett-Packard (HP) committed a strategic error when it acquired Compaq Computers at a cost of \$19 billion. HP's share of the computer market was less after the merger than the sum of the shares of the separate companies before the merger. In another example, U.S. automakers adopted a

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**Core competencies** The special attributes or abilities that give an organization a competitive edge.

Organization Strategy	Operations Strategy	Examples of Companies or Services
<b>Low price</b>	Low cost	U.S. first-class postage Walmart
<b>Responsiveness</b>	Short processing time	Southwest Airlines McDonald's restaurants Express Mail, UPS, FedEx One-hour photo
	On-time delivery	Domino's Pizza FedEx
<b>Differentiation: High quality</b>	High-performance design and/or high-quality processing	Sony TV Lexus Disneyland Five-star restaurants or hotels
	Consistent quality	Coca-Cola, PepsiCo Wegmans Electrical power
<b>Differentiation: Newness</b>	Innovation	3M, Apple Google
<b>Differentiation: Variety</b>	Flexibility	Burger King ("Have it your way") Hospital emergency room
	Volume	McDonald's ("Buses welcome") Toyota Supermarkets (additional checkouts)
<b>Differentiation: Service</b>	Superior customer service	Disneyland Amazon IBM Nordstrom
<b>Differentiation: Location</b>	Convenience	Supermarkets, dry cleaners Mall stores Service stations Banks, ATMs

**TABLE 2.2**  
Examples of operations strategies

strategy in the early 2000s of offering discounts and rebates on a range of cars and SUVs, many of which were on low-margin vehicles. The strategy put a strain on profits, but customers began to expect those incentives, and the companies maintained them to keep from losing additional market share.

On the other hand, Coach, the maker of leather handbags and purses, successfully changed its longtime strategy to grow its market by creating new products. Long known for its highly durable leather goods in a market where women typically owned few handbags, Coach created a new market for itself by changing women's view of handbags by promoting "different handbags for different occasions" such as party bags, totes, clutches, wristlets, overnight bags, purses, and day bags. And Coach introduced many fashion styles and colors.

To formulate an effective strategy, senior managers must take into account the core competencies of the organizations, and they must *scan the environment*. They must determine what competitors are doing, or planning to do, and take that into account. They must critically examine other factors that could have either positive or negative effects. This is sometimes referred to as the **SWOT** approach (strengths, weaknesses, opportunities, and threats). Strengths and weaknesses have an internal focus and are typically evaluated by operations people. Threats and opportunities have an external focus and are typically evaluated by marketing people. SWOT is often regarded as the link between organizational strategy and operations strategy.

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**SWOT** Analysis of strengths, weaknesses, opportunities, and threats.



An alternative to SWOT analysis is Michael Porter's five forces model,<sup>1</sup> which takes into account the threat of new competition, the threat of substitute products or services, the bargaining power of customers, the bargaining power of suppliers, and the intensity of competition.

In formulating a successful strategy, organizations must take into account both order qualifiers and order winners. **Order qualifiers** are those characteristics that potential customers perceive as minimum standards of acceptability for a product to be considered for purchase. However, that may not be sufficient to get a potential customer to purchase from the organization. **Order winners** are those characteristics of an organization's goods or services that cause them to be perceived as better than the competition.

Characteristics such as price, delivery reliability, delivery speed, and quality can be order qualifiers or order winners. Thus, quality may be an order winner in some situations, but in others only an order qualifier. Over time, a characteristic that was once an order winner may become an order qualifier, and vice versa.

Obviously, it is important to determine the set of order qualifier characteristics and the set of order winner characteristics. It is also necessary to decide on the relative importance of each characteristic so that appropriate attention can be given to the various characteristics. Marketing must make that determination and communicate it to operations.

**Environmental scanning** is the monitoring of events and trends that present either threats or opportunities for the organization. Generally these include competitors' activities; changing consumer needs; legal, economic, political, and environmental issues; the potential for new markets; and the like.

Another key factor to consider when developing strategies is technological change, which can present real opportunities and threats to an organization. Technological changes occur in products (high-definition TV, improved computer chips, improved cellular telephone systems, and improved designs for earthquake-proof structures); in services (faster order processing, faster delivery); and in processes (robotics, automation, computer-assisted processing, point-of-sale scanners, and flexible manufacturing systems). The obvious benefit is a competitive edge; the risk is that incorrect choices, poor execution, and higher-than-expected operating costs will create competitive *disadvantages*.

Important factors may be internal or external. The following are key external factors:

1. **Economic conditions.** These include the general health and direction of the economy, inflation and deflation, interest rates, tax laws, and tariffs.
2. **Political conditions.** These include favorable or unfavorable attitudes toward business, political stability or instability, and wars.
3. **Legal environment.** This includes antitrust laws, government regulations, trade restrictions, minimum wage laws, product liability laws and recent court experience, labor laws, and patents.
4. **Technology.** This can include the rate at which product innovations are occurring, current and future process technology (equipment, materials handling), and design technology.
5. **Competition.** This includes the number and strength of competitors, the basis of competition (price, quality, special features), and the ease of market entry.
6. **Markets.** This includes size, location, brand loyalties, ease of entry, potential for growth, long-term stability, and demographics.

The organization also must take into account various *internal factors* that relate to possible strengths or weaknesses. Among the key internal factors are the following:

1. **Human resources.** These include the skills and abilities of managers and workers, special talents (creativity, designing, problem solving), loyalty to the organization, expertise, dedication, and experience.

<sup>1</sup>Michael E. Porter, "The Five Competitive Forces That Shape Strategy," *Harvard Business Review* 86, no. 1 (January 2008), pp. 78–93, 137.

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**Order qualifiers** Characteristics that customers perceive as minimum standards of acceptability to be considered as a potential for purchase.

**Order winners** Characteristics of an organization's goods or services that cause it to be perceived as better than the competition.

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**Environmental scanning** The monitoring of events and trends that present threats or opportunities for a company.

2. **Facilities and equipment.** Capacities, location, age, and cost to maintain or replace can have a significant impact on operations.
3. **Financial resources.** Cash flow, access to additional funding, existing debt burden, and cost of capital are important considerations.
4. **Customers.** Loyalty, existing relationships, and understanding of wants and needs are important.
5. **Products and services.** These include existing products and services, and the potential for new products and services.
6. **Technology.** This includes existing technology, the ability to integrate new technology, and the probable impact of technology on current and future operations.
7. **Suppliers.** Supplier relationships, dependability of suppliers, quality, flexibility, and service are typical considerations.
8. **Other.** Other factors include patents, labor relations, company or product image, distribution channels, relationships with distributors, maintenance of facilities and equipment, access to resources, and access to markets.

After assessing internal and external factors and an organization's distinctive competence, a strategy or strategies must be formulated that will give the organization the best chance of success. Among the types of questions that may need to be addressed are the following:

What role, if any, will the Internet play?

Will the organization have a global presence?

To what extent will *outsourcing* be used?

What will the supply chain management strategy be?

To what extent will new products or services be introduced?

What rate of growth is desirable and *sustainable*?

What emphasis, if any, should be placed on lean production?

How will the organization differentiate its products and/or services from competitors'?

The organization may decide to have a single, dominant strategy (e.g., be the price leader) or to have multiple strategies. A single strategy would allow the organization to concentrate on one particular strength or market condition. On the other hand, multiple strategies may be needed to address a particular set of conditions.

Many companies are increasing their use of outsourcing to reduce overhead, gain flexibility, and take advantage of suppliers' expertise. Dell Computers provides a great example of some of the potential benefits of outsourcing as part of a business strategy.

Growth is often a component of strategy, especially for new companies. A key aspect of this strategy is the need to seek a growth rate that is sustainable. In the 1990s, fast-food company Boston Markets dazzled investors and fast-food consumers alike. Fueled by its success, it undertook rapid expansion. By the end of the decade, the company was nearly bankrupt; it had overexpanded. In 2000, it was absorbed by fast-food giant McDonald's.

Companies increase their risk of failure not only by missing or incomplete strategies; they also fail due to poor execution of strategies. And sometimes they fail due to factors beyond their control, such as natural or man-made disasters, major political or economic changes, or competitors that have an overwhelming advantage (e.g., deep pockets, very low labor costs, less rigorous environmental requirements).

A useful resource on successful business strategies is the Profit Impact of Market Strategy (PIMS) database ([www.pimsonline.com](http://www.pimsonline.com)). The database contains profiles of over 3,000 businesses located primarily in the United States, Canada, and western Europe. It is used by companies and academic institutions to guide strategic thinking. It allows subscribers to answer strategy questions about their business. Moreover, they can use it to generate benchmarks and develop successful strategies.

In 1984, Michael Dell, then a college student, started selling personal computers from his dorm room. He didn't have the resources to make computer components, so he let others do that, choosing instead to concentrate on selling the computers. And, unlike the major computer producers, he didn't sell to dealers. Instead, he sold directly to PC buyers, eliminating some intermediaries, which allowed for lower cost and faster delivery. Although direct selling of PCs is fairly commonplace now, in those days it was a major departure from the norm.

What did Dell do that was so different from the big guys? To start, he bought components from suppliers instead of making them. That gave him tremendous leverage. He had little inventory, no R&D expenditures, and relatively few employees. And the risks of this approach were spread among his suppliers. Suppliers were willing

to do this because Dell worked closely with them, and kept them informed. And because he was in direct contact with his customers, he gained tremendous insight into their expectations and needs, which he communicated to his suppliers.

Having little inventory gave Dell several advantages over his competitors. Aside from the lower costs of inventory, when new, faster computer chips became available, there was little inventory to work off, so he was able to offer the newer models much sooner than competitors with larger inventories. Also, when the prices of various components dropped, as they frequently did, he was able to take advantage of the lower prices, which kept his average costs lower than competitors'.

Today the company is worth billions, and so is Michael Dell.

## STRATEGY FORMULATION

The key steps in strategy formulation are:

1. Link strategy directly to the organization's mission or vision statement.
2. Assess strengths, weaknesses, threats and opportunities, and identify core competencies.
3. Identify order winners and order qualifiers.
4. Select one or two strategies (e.g., low cost, speed, customer service) to focus on.

According to the PIMS Web site,

The *database* is a collection of statistically documented experiences drawn from thousands of businesses, designed to help understand what kinds of strategies (e.g. quality, pricing, vertical integration, innovation, advertising) work best in what kinds of business environments. The data constitute a key resource for such critical management tasks as evaluating business performance, analyzing new business opportunities, evaluating and reality testing new strategies, and screening business portfolios. *The primary role* of the PIMS Program of the Strategic Planning Institute is to help managers understand and react to their business environment. PIMS does this by assisting managers as they develop and test strategies that will achieve an acceptable level of winning as defined by various strategies and financial measures.

## Supply Chain Strategy

A supply chain strategy specifies how the supply chain should function to achieve supply chain goals. The supply chain strategy should be aligned with the business strategy. If it is well executed, it can create value for the organization. It establishes how the organization should work with suppliers and policies relating to customer relationships and sustainability. Supply chain strategy is covered in more detail in a later chapter.

## Sustainability Strategy

Society is placing increasing emphasis on corporate sustainability practices in the form of governmental regulations and interest groups. For these and other reasons, business organizations are or should be devoting attention to sustainability goals. To be successful, they will need a sustainability strategy. That requires elevating sustainability to the level of organizational governance; formulating goals for products and services, for processes, and for the entire supply chain; measuring achievements and striving for improvements; and possibly linking executive compensation to the achievement of sustainability goals.

## Global Strategy

As globalization increased, many companies realized that strategic decisions with respect to globalization must be made. One issue companies must face is that what works in one country

or region will not necessarily work in another, and strategies must be carefully crafted to take these variabilities into account. Another issue is the threat of political or social upheaval. Still another issue is the difficulty of coordinating and managing far-flung operations. Indeed, “In today’s global markets, you don’t have to go abroad to experience international competition. Sooner or later the world comes to you.”<sup>2</sup>



At this McDonald's in Singapore, one variable is the use of rice as a staple of the Chinese diet. This ad highlights rice burgers.

## 2.4 OPERATIONS STRATEGY

The organization strategy provides the overall direction for the organization. It is broad in scope, covering the entire organization. **Operations strategy** is narrower in scope, dealing primarily with the operations aspect of the organization. Operations strategy relates to products, processes, methods, operating resources, quality, costs, lead times, and scheduling. Table 2.3 provides a comparison of an organization’s mission, its overall strategy, and its operations strategy, tactics, and operations.

In order for operations strategy to be truly effective, it is important to link it to organization strategy; that is, the two should not be formulated independently. Rather, formulation of organization strategy should take into account the realities of operations’ strengths and weaknesses, capitalizing on strengths and dealing with weaknesses. Similarly, operations strategy must be consistent with the overall strategy of the organization, and with the other functional units of the organization. This requires that senior managers work with functional units to formulate strategies that will support, rather than conflict with, each other and the overall strategy of the organization. As obvious as this may seem, it doesn’t always happen in practice. Instead, we may find power struggles between various functional units. These struggles are detrimental to the organization because they pit functional units against each other rather than focusing their energy on making the organization more competitive and better able to serve the customer. Some of the latest approaches in organizations, involving teams of managers and workers, may reflect a growing awareness of the synergistic effects of working together rather than competing internally.

**LO2.4** Discuss and compare organization strategy and operations strategy and explain why it is important to link the two.

**Operations strategy** The approach, consistent with the organization strategy, that is used to guide the operations function.

<sup>2</sup>Christopher A. Bartlett and Sumantra Ghoshal, “Going Global: Lessons from Late Movers,” *Harvard Business Review*, March–April 2000, p. 139.



**TABLE 2.3** Comparison of mission, organization strategy, and operations strategy

		Management Level	Time Horizon	Scope	Level of Detail	Relates to
The overall organization	Mission Strategy	Top	Long	Broad	Low	Survival, profitability
		Senior	Long	Broad	Low	Growth rate, market share
Operations	Strategic	Senior	Moderate to long	Broad	Low	Product design, choice of location, choice of technology, new facilities
	Tactical	Middle	Moderate	Moderate	Moderate	Employment levels, output levels, equipment selection, facility layout
	Operational	Low	Short	Narrow	High	Scheduling personnel, adjusting output rates, inventory management, purchasing

In the 1970s and early 1980s, operations strategy in the United States was often neglected in favor of marketing and financial strategies. That may have occurred because many chief executive officers did not come from operations backgrounds and perhaps did not fully appreciate the importance of the operations function. Mergers and acquisitions were common; leveraged buyouts were used, and conglomerates were formed that joined dissimilar operations. These did little to add value to the organization; they were purely financial in nature. Decisions were often made by individuals who were unfamiliar with the business, frequently to the detriment of that business. Meanwhile, foreign competitors began to fill the resulting vacuum with a careful focus on operations strategy.

In the late 1980s and early 1990s, many companies began to realize this approach was not working. They recognized that they were less competitive than other companies. This caused them to focus attention on operations strategy. A key element of both organization strategy and operations strategy is strategy formulation.

Operations strategy can have a major influence on the competitiveness of an organization. If it is well designed and well executed, there is a good chance that the organization will be successful; if it is not well designed or executed, the chances are much less that the organization will be successful.

## Strategic Operations Management Decision Areas

Operations management people play a strategic role in many strategic decisions in a business organization. Table 2.4 highlights some key decision areas. Notice that most of the decision areas have cost implications.

Two factors that tend to have universal strategic operations importance relate to quality and time. The following section discusses quality and time strategies.

**TABLE 2.4**

Strategic operations management decisions

Decision Area	What the Decisions Affect
1. Product and service design	Costs, quality, liability and environmental issues
2. Capacity	Cost structure, flexibility
3. Process selection and layout	Costs, flexibility, skill level needed, capacity
4. Work design	Quality of work life, employee safety, productivity
5. Location	Costs, visibility
6. Quality	Ability to meet or exceed customer expectations
7. Inventory	Costs, shortages
8. Maintenance	Costs, equipment reliability, productivity
9. Scheduling	Flexibility, efficiency
10. Supply chains	Costs, quality, agility, shortages, vendor relations
11. Projects	Costs, new products, services, or operating systems

## Quality and Time Strategies

Traditional strategies of business organizations have tended to emphasize cost minimization or product differentiation. While not abandoning those strategies, many organizations have embraced strategies based on *quality* and/or *time*.

**Quality-based strategies** focus on maintaining or improving the quality of an organization's products or services. Quality is generally a factor in both attracting and retaining customers. Quality-based strategies may be motivated by a variety of factors. They may reflect an effort to overcome an image of poor quality, a desire to catch up with the competition, a desire to maintain an existing image of high quality, or some combination of these and other factors. Interestingly enough, quality-based strategies can be part of another strategy such as cost reduction, increased productivity, or time, all of which benefit from higher quality.

**Time-based strategies** focus on reducing the time required to accomplish various activities (e.g., develop new products or services and market them, respond to a change in customer demand, or deliver a product or perform a service). By doing so, organizations seek to improve service to the customer and to gain a competitive advantage over rivals who take more time to accomplish the same tasks.

**L02.5** Describe and give examples of time-based strategies.

**Quality-based strategy** Strategy that focuses on quality in all phases of an organization.

**Time-based strategy** Strategy that focuses on reduction of time needed to accomplish tasks.

### Productivity Gains Curb Inflation

### READING



Wage increases can lead to inflationary pressure. They can cause the prices consumers pay for products and services to rise—unless, that is, they are offset by gains in productivity, which lead to an increase in profits. If that happens, a portion of the resulting profits can be used to cover the wage increases without having to raise prices.

Some Burger Kings were able to increase the starting pay of new workers by \$1 by achieving productivity gains. The restaurants restructured the menu, combining items into meal packages such as a burger,

fries, and soft drink. This enabled the counter staff to enter orders with a single keystroke instead of multiple keystrokes on their point-of-sale machines, reducing the time needed to take an order. That, in turn, enabled them to take orders more quickly, increasing productivity and, consequently, reducing labor requirements, which produced higher profits.

Source: Based on "Despite Pay Increases, Gains in Productivity, Profits Curb Inflation," *The Wall Street Journal*, May 22, 1997, p. A1.

Time-based strategies focus on reducing the time needed to conduct the various activities in a process. The rationale is that by reducing time, costs are generally less, productivity is higher, quality tends to be higher, product innovations appear on the market sooner, and customer service is improved.

Organizations have achieved time reduction in some of the following:

**Planning time:** The time needed to react to a competitive threat, to develop strategies and select tactics, to approve proposed changes to facilities, to adopt new technologies, and so on.

**Product/service design time:** The time needed to develop and market new or redesigned products or services.

**Processing time:** The time needed to produce goods or provide services. This can involve scheduling, repairing equipment, methods used, inventories, quality, training, and the like.

**Changeover time:** The time needed to change from producing one type of product or service to another. This may involve new equipment settings and attachments, different methods, equipment, schedules, or materials.

**Delivery time:** The time needed to fill orders.

**Response time for complaints:** These might be customer complaints about quality, timing of deliveries, and incorrect shipments. These might also be complaints from employees about working conditions (e.g., safety, lighting, heat or cold), equipment problems, or quality problems.

It is essential for marketing and operations personnel to collaborate on strategy formulation in order to ensure that the buying criteria of the most important customers in each market segment are addressed.

Agile operations is a strategic approach for competitive advantage that emphasizes the use of flexibility to adapt and prosper in an environment of change. Agility involves a blending of several distinct competencies such as cost, quality, and reliability along with flexibility. Processing aspects of flexibility include quick equipment changeovers, scheduling, and innovation. Product or service aspects include varying output volumes and product mix.

Successful agile operations requires careful planning to achieve a system that includes people, flexible equipment, and information technology. Reducing the time needed to perform work is one of the ways an organization can improve a key metric: *productivity*.

## 2.5 IMPLICATIONS OF ORGANIZATION STRATEGY FOR OPERATIONS MANAGEMENT

Organization strategy has a major impact on operations and supply chain management strategies. For example, organizations that use a low-cost, high-volume strategy limit the amount of variety offered to customers. As a result, variations for operations and the supply chain are minimal, so they are easier to deal with. Conversely, a strategy to offer a wide variety of products or services, or to perform customized work, creates substantial operational and supply chain variations and, hence, more challenges in achieving a smooth flow of goods and services throughout the supply chain, thus making the matching of supply to demand more difficult. Similarly, increasing service reduces the ability to compete on price. Table 2.5 provides a brief overview of variety and some other key implications.

## 2.6 TRANSFORMING STRATEGY INTO ACTION: THE BALANCED SCORECARD

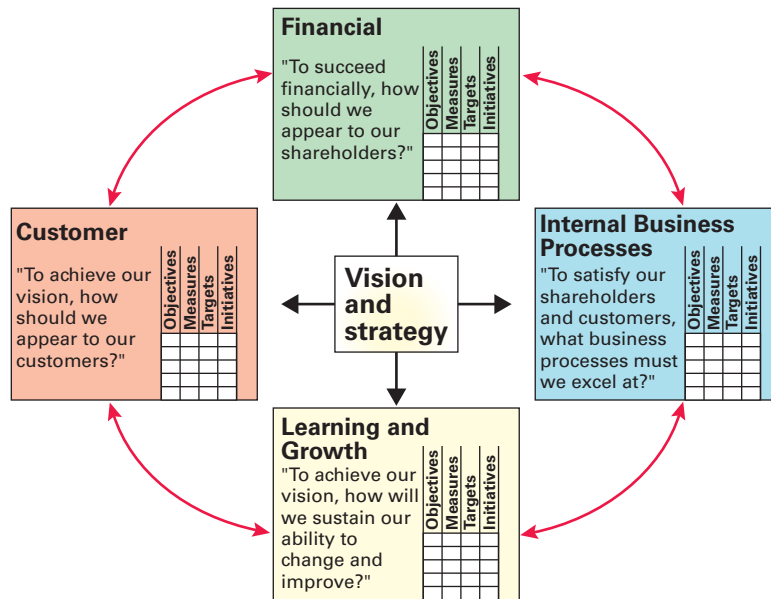
The Balanced Scorecard (BSC) is a top-down *management system* that organizations can use to clarify their vision and strategy and transform them into action. It was introduced in the early 1990s by Robert Kaplan and David Norton,<sup>3</sup> and it has been revised and improved

**TABLE 2.5**

Organization strategies and their implications for operations management

Organization Strategy	Implications for Operations Management
<b>Low price</b>	Requires low variation in products/services and a high-volume, steady flow of goods results in maximum use of resources through the system. Standardized work, material, and inventory requirements.
<b>High quality</b>	Entails higher initial cost for product and service design, and process design, and more emphasis on assuring supplier quality.
<b>Quick response</b>	Requires flexibility, extra capacity, and higher levels of some inventory items.
<b>Newness/innovation</b>	Entails large investment in research and development for new or improved products and services plus the need to adapt operations and supply processes to suit new products or services.
<b>Product or service variety</b>	Requires high variation in resource and more emphasis on product and service design; higher worker skills needed, cost estimation more difficult; scheduling more complex; quality assurance more involved; inventory management more complex; and matching supply to demand more difficult.
<b>Sustainability</b>	Affects location planning, product and service design, process design, outsourcing decisions, returns policies, and waste management.

<sup>3</sup>Robert S. Kaplan and David P. Norton, *Balanced Scorecard: Translating Strategy into Action* (Cambridge, MA: Harvard Business School Press, 1996).



**FIGURE 2.2**

The Balanced Scorecard

Source: Reprinted with permission of Harvard Business School Press from Robert Kaplan and David Norton, *Balanced Scorecard: Translating Strategy into Action*. Copyright © 1996 by the Harvard Business School Publishing Corporation. All rights reserved.

since then. The idea was to move away from a purely financial perspective of the organization and integrate other perspectives such as customers, internal business processes, and learning and growth. Using this approach, managers develop objectives, metrics, and targets for each objective and initiatives to achieve objectives, and they identify links among the various perspectives. Results are monitored and used to improve strategic performance results. Figure 2.2 illustrates the conceptual framework of this approach. Many organizations employ this or a similar approach.

As seen in Figure 2.2, the four perspectives are intended to balance not only financial and nonfinancial performance, but also internal and external performance as well as past and future performance. This approach can also help organizations focus on how they differ from the competition in each of the four areas if their vision is realized. Table 2.6 has some examples of factors for key focal points.

Although the Balanced Scorecard helps focus managers' attention on strategic issues and the implementation of strategy, it is important to note that it has no role in strategy formulation.



*A major key to Apple's continued success is its ability to keep pushing the boundaries of innovation. Apple has demonstrated how to create growth by dreaming up products so new and ingenious that they have upended one industry after another.*



**TABLE 2.6**

Balanced scorecard factors examples

Focal Point	Factors
Suppliers	Delivery performance Quality performance Number of suppliers Supplier locations Duplicate activities
Internal Processes	Bottlenecks Automation potential Turnover
Employees	Job satisfaction Learning opportunities Delivery performance
Customers	Quality performance Satisfaction Retention rate

Moreover, this approach pays little attention to suppliers and government regulations, and community, environmental, and sustainability issues are missing. These are closely linked, and business organizations need to be aware of the impact they are having in these areas and respond accordingly. Otherwise, organizations may be subject to attack by pressure groups and risk damage to their reputation.

## 2.7 PRODUCTIVITY

**L02.6** Define the term *productivity* and explain why it is important to companies and to countries.

One of the primary responsibilities of a manager is to achieve *productive use* of an organization's resources. The term *productivity* is used to describe this. **Productivity** is an index that measures output (goods and services) relative to the input (labor, materials, energy, and other resources) used to produce it. It is usually expressed as the ratio of output to input:

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}} \quad (2-1)$$

**Productivity** A measure of the effective use of resources, usually expressed as the ratio of output to input.

Although productivity is important for all business organizations, it is particularly important for organizations that use a strategy of low cost, because the higher the productivity, the lower the cost of the output.

A productivity ratio can be computed for a single operation, a department, an organization, or an entire country. In business organizations, productivity ratios are used for planning workforce requirements, scheduling equipment, financial analysis, and other important tasks.

Productivity has important implications for business organizations and for entire nations. For nonprofit organizations, higher productivity means lower costs; for profit-based organizations, productivity is an important factor in determining how competitive a company is. For a nation, the rate of *productivity growth* is of great importance. Productivity growth is the increase in productivity from one period to the next relative to the productivity in the preceding period. Thus,

$$\text{Productivity growth} = \frac{\text{Current productivity} - \text{Previous productivity}}{\text{Previous productivity}} \times 100 \quad (2-2)$$

For example, if productivity increased from 80 to 84, the growth rate would be

$$\frac{84 - 80}{80} \times 100 = 5\%$$



Productivity can be enhanced by the use of robotic equipment. Robots can operate for long periods with consistent precision and high speed. The Hyundai Motor Company manufacturing plant in Montgomery, Alabama, uses robots for assembly work. This \$1.4 billion automotive plant is one of the most advanced assembly plants in North America.

Productivity growth is a key factor in a country’s rate of inflation and the standard of living of its people. Productivity increases add value to the economy while keeping inflation in check. Productivity growth was a major factor in the long period of sustained economic growth in the United States in the 1990s.

### Computing Productivity

Productivity measures can be based on a single input (partial productivity), on more than one input (multifactor productivity), or on all inputs (total productivity). Table 2.7 lists some examples of productivity measures. The choice of productivity measure depends primarily on the purpose of the measurement. If the purpose is to track improvements in labor productivity, then labor becomes the obvious input measure.

Partial measures are often of greatest use in operations management. Table 2.8 provides some examples of partial productivity measures.

The units of output used in productivity measures depend on the type of job performed. The following are examples of labor productivity:

$$\frac{\text{Yards of carpet installed}}{\text{Labor hours}} = \text{Yards of carpet installed per labor hour}$$

$$\frac{\text{Number of motel rooms cleaned}}{\text{Number of workers}} = \text{Number of motel rooms cleaned per worker}$$

Partial measures	$\frac{\text{Output}}{\text{Labor}}$	$\frac{\text{Output}}{\text{Machine}}$	$\frac{\text{Output}}{\text{Capital}}$	$\frac{\text{Output}}{\text{Energy}}$
Multifactor measures	$\frac{\text{Output}}{\text{Labor} + \text{Machine}}$		$\frac{\text{Output}}{\text{Labor} + \text{Capital} + \text{Energy}}$	
Total measure	$\frac{\text{Goods or services produced}}{\text{All inputs used to produce them}}$			

**TABLE 2.7**  
Some examples of different types of productivity measures

**TABLE 2.8**

Some examples of partial productivity measures

<b>Labor productivity</b>	Units of output per labor hour Units of output per shift Value-added per labor hour Dollar value of output per labor hour
<b>Machine productivity</b>	Units of output per machine hour Dollar value of output per machine hour
<b>Capital productivity</b>	Units of output per dollar input Dollar value of output per dollar input
<b>Energy productivity</b>	Units of output per kilowatt-hour Dollar value of output per kilowatt-hour

Similar examples can be listed for *machine productivity* (e.g., the number of pieces per hour turned out by a machine).

**EXAMPLE 2**

**eXcel**  
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Determine the productivity for these cases:

- Four workers installed 720 square yards of carpeting in eight hours.
- A machine produced 70 pieces in two hours. However, two pieces were unusable.

**SOLUTION**

- $$\begin{aligned} \text{Productivity} &= \frac{\text{Yards of carpet installed}}{\text{Labor hours worked}} \\ &= \frac{720 \text{ square yards}}{4 \text{ workers} \times 8 \text{ hours/worker}} \\ &= \frac{720 \text{ yards}}{32 \text{ hours}} \\ &= 22.5 \text{ yards/hour} \end{aligned}$$
- $$\begin{aligned} \text{Productivity} &= \frac{\text{Usable pieces}}{\text{Production time}} \\ &= \frac{70 - 2 = 68 \text{ usable pieces}}{2 \text{ hours}} \\ &= 34 \text{ pieces/hour} \end{aligned}$$

Calculations of multifactor productivity measure inputs and outputs using a common unit of measurement, such as cost. For instance, the measure might use cost of inputs and units of the output:

$$\frac{\text{Quantity of production}}{\text{Labor cost} + \text{Materials cost} + \text{Overhead}} \quad (2-3)$$

*Note:* The unit of measure must be the same for all factors in the denominator.

**EXAMPLE 3**

**eXcel**  
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Determine the multifactor productivity for the combined input of labor and machine time using the following data:

- Output: 7,040 units  
Input
- Labor: \$1,000
  - Materials: \$520
  - Overhead: \$2,000

$$\begin{aligned} \text{Multifactor productivity} &= \frac{\text{Output}}{\text{Labor} + \text{Materials} + \text{Overhead}} \\ &= \frac{7,040 \text{ units}}{\$1,000 + \$520 + \$2,000} = 2 \text{ units per dollar input} \end{aligned}$$

## SOLUTION

Productivity measures are useful on a number of levels. For an individual department or organization, productivity measures can be used to track performance *over time*. This allows managers to judge performance and to decide where improvements are needed. For example, if productivity has slipped in a certain area, operations staff can examine the factors used to compute productivity to determine what has changed and then devise a means of improving productivity in subsequent periods.

Productivity measures also can be used to judge the performance of an entire industry or the productivity of a country as a whole. These productivity measures are *aggregate* measures.

In essence, productivity measurements serve as scorecards of the effective use of resources. Business leaders are concerned with productivity as it relates to *competitiveness*: If two firms both have the same level of output but one requires less input because of higher productivity, that one will be able to charge a lower price and consequently increase its share of the market. Or that firm might elect to charge the same price, thereby reaping a greater profit. Government leaders are concerned with national productivity because of the close relationship between productivity and a nation's standard of living. High levels of productivity are largely responsible for the relatively high standards of living enjoyed by people in industrial nations. Furthermore, wage and price increases not accompanied by productivity increases tend to create inflationary pressures on a nation's economy.

Advantages of domestic-based operations for domestic markets often include higher worker productivity, better control of quality, avoidance of intellectual property losses, lower shipping costs, political stability, low inflation, and faster delivery.

## Why Productivity Matters

It is sometimes easy to overlook the importance of productivity. National figures are often reported in the media. They may seem to be ho-hum; there's nothing glamorous about them to get our attention. But make no mistake; they are key economic indicators—barometers, if you will, that affect everybody. How? High productivity and high standard of living go hand-in-hand. If a country becomes more service-based, as the United States has become, some (but not all) high-productivity manufacturing jobs are replaced by lower-productivity service jobs. That makes it more difficult to support a high standard of living.

Productivity levels are also important for industries and companies. For companies, a higher productivity relative to their competitors gives them a competitive advantage in the marketplace. With a higher

productivity, they can afford to undercut competitors' prices to gain market share or charge the same prices but realize greater profits! For an industry, higher relative productivity means it is less likely to be supplanted by foreign industry.

### Questions

1. Why is high productivity important for a nation?
2. Why do you suppose that service jobs have lower productivity than manufacturing jobs?
3. How can a company gain a competitive advantage by having higher productivity than its competitors have?



## READING

## Productivity in the Service Sector

Service productivity is more problematic than manufacturing productivity. In many situations, it is more difficult to measure, and thus to manage, because it involves intellectual activities and a high degree of variability. Think about medical diagnoses, surgery, consulting, legal services, customer service, and computer repair work. This makes productivity improvements



more difficult to achieve. Nonetheless, because service is becoming an increasingly large portion of our economy, the issues related to service productivity will have to be dealt with. It is interesting to note that government statistics normally do not include service firms.

A useful measure closely related to productivity is *process yield*. Where products are involved, process yield is defined as the ratio of output of good product (i.e., defective product is not included) to the quantity of raw material input. Where services are involved, process yield measurement is often dependent on the particular process. For example, in a car rental agency, a measure of yield is the ratio of cars rented to cars available for a given day. In education, a measure for college and university admission yield is the ratio of student acceptances to the total number of students approved for admission. For subscription services, yield is the ratio of new subscriptions to the number of calls made or the number of letters mailed. However, not all services lend themselves to a simple yield measurement. For example, services such as automotive, appliance, and computer repair don't readily lend themselves to such measures.

## Dutch Tomato Growers' Productivity Advantage

### READING



Tomato growers in the Netherlands have a huge productivity advantage over their competitors in Italy and Greece. Although those countries are sun drenched while the Netherlands are anything but, computerized, climate-controlled greenhouses, and a "soil" spun from basalt and chalk that resembles cotton candy, allows for precise control of humidity and nutrition, and enables growers to produce their crops year around. Growers in Italy and Greece generally grow their crops outdoors or in unheated greenhouses, and can only manage two crops a year. Dutch growers are able to achieve yields that are about ten times per square yard of those of Italian and Greek growers. And the Dutch have a supply chain advantage: an integrated Dutch trading company works closely with supermarket chains in Europe and suppliers around the world, so farmers are able to sell their output in high volume, rather than locally the way

many farmers in other countries do. That enables Dutch growers to more closely match supply with supermarket demand. Finally, the Dutch tomato has been engineered to achieve a firmness that allows growers to harvest and ship tomatoes at their peak, while the "outdoor" farmers typically need to harvest their tomatoes before they are fully ripe to allow for firmness during shipping.

### Questions

1. What factors enable Dutch tomato growers to achieve much higher productivity than the Italian and Greek growers?
2. Discuss the importance of the Dutch growers' supply chain.

Source: Based on "Tomato," *Time*, March 25, 2013, pp. 9–14.

**L02.7** Describe several factors that affect productivity.

## Factors That Affect Productivity

Numerous factors affect productivity. Generally, they are methods, capital, quality, technology, and management.

A commonly held misconception is that workers are the main determinant of productivity. According to that theory, the route to productivity gains involves getting employees to work harder. However, the fact is that many productivity gains in the past have come from *technological* improvements. Familiar examples include

Fax machines	Automation	GPS devices
Copiers	Calculators	Smart phones
The Internet, search engines	Computers	Apps
Voice mail, cellular phones	E-mail	3-D printing
	Software	Medical imaging

However, technology alone won't guarantee productivity gains; it must be used wisely and thoughtfully. Without careful planning, technology can actually *reduce* productivity, especially if it leads to inflexibility, high costs, or mismatched operations. Another current productivity pitfall results from employees' use of computers or smart phones for nonwork-related activities (playing games or checking stock prices or sports scores on the Internet or smart phones, and texting friends and relatives). Beyond all of these is the dip in productivity that results while employees learn to use new equipment or procedures that will eventually lead to productivity gains after the learning phase ends.

Other factors that affect productivity include the following:

**Standardizing** processes and procedures wherever possible to reduce variability can have a significant benefit for both productivity and quality.

**Quality differences** may distort productivity measurements. One way this can happen is when comparisons are made over time, such as comparing the productivity of a factory now with one 30 years ago. Quality is now much higher than it was then, but there is no simple way to incorporate quality improvements into productivity measurements.

**Use of the Internet** can lower costs of a wide range of transactions, thereby increasing productivity. It is likely that this effect will continue to increase productivity in the foreseeable future.

**Computer viruses** can have an immense negative impact on productivity.

**Searching for lost or misplaced items** wastes time, hence negatively affecting productivity.

**Scrap rates** have an adverse effect on productivity, signaling inefficient use of resources.

**New workers** tend to have lower productivity than seasoned workers. Thus, growing companies may experience a productivity lag.

**Safety** should be addressed. Accidents can take a toll on productivity.

**A shortage of technology-savvy workers** hampers the ability of companies to update computing resources, generate and sustain growth, and take advantage of new opportunities.

**Layoffs** often affect productivity. The effect can be positive and negative. Initially, productivity may increase after a layoff, because the workload remains the same but fewer workers do the work—although they have to work harder and longer to do it. However, as time goes by, the remaining workers may experience an increased risk of burnout, and they may fear additional job cuts. The most capable workers may decide to leave.

**Labor turnover** has a negative effect on productivity; replacements need time to get up to speed.

**Design of the workspace** can impact productivity. For example, having tools and other work items within easy reach can positively impact productivity.

**Incentive plans that reward productivity increases** can boost productivity.

And there are still other factors that affect productivity, such as *equipment breakdowns* and *shortages* of parts or materials. The education level and training of workers and their health can greatly affect productivity. The opportunity to obtain lower costs due to higher productivity elsewhere is a key reason many organizations turn to *outsourcing*. Hence, an alternative to outsourcing can be improved productivity. Moreover, as a part of their strategy for quality, the best organizations strive for *continuous improvement*. Productivity improvements can be an important aspect of that approach.

## Improving Productivity

A company or a department can take a number of key steps toward improving productivity:

1. Develop productivity measures for all operations. Measurement is the first step in managing and controlling an operation.
2. Look at the system as a whole in deciding which operations are most critical. It is overall productivity that is important. Managers need to reflect on the value of potential productivity improvements *before* okaying improvement efforts. The issue is *effectiveness*. There are several aspects of this. One is to make sure the result will be something customers want. For example, if a company is able to increase its output through productivity improvements, but then is unable to sell the increased output, the increase in productivity isn't effective. Second, it is important to adopt a systems viewpoint: A productivity increase in one part of an operation that doesn't increase the productivity of the system would not be effective. For example, suppose a system consists of a sequence of two operations, where the output of the first operation is the input to the second operation, and

each operation can complete its part of the process at a rate of 20 units per hour. If the productivity of the first operation is increased, but the productivity of the second operation is not, the output of the system will still be 20 units per hour.

3. Develop methods for achieving productivity improvements, such as soliciting ideas from workers (perhaps organizing teams of workers, engineers, and managers), studying how other firms have increased productivity, and reexamining the way work is done.
4. Establish reasonable goals for improvement.
5. Make it clear that management supports and encourages productivity improvement. Consider incentives to reward workers for contributions.
6. Measure improvements and publicize them.

Don't confuse productivity with *efficiency*. Efficiency is a narrower concept that pertains to getting the most out of a *fixed* set of resources; productivity is a broader concept that pertains to effective use of overall resources. For example, an efficiency perspective on mowing a lawn given a hand mower would focus on the best way to use the hand mower; a productivity perspective would include the possibility of using a power mower.

## Productivity Improvement

## READING



Stryker Howmedica set up a team to improve the running of its packaging line. A strategy focus on productivity improvement was used. The team adopted an approach based on the production system of Toyota. The goal was to satisfy the customer expectations for delivery and quality, while achieving gains in productivity. After the team identified needs and set objectives, a number of improvements were implemented. A one-piece flow was established that reduced bottlenecks in the flow of

devices through a clean room and the total time spent blister sealing devices was lowered. Within a short time, productivity nearly doubled from 36 devices per hour to 60 devices per hour, work-in-progress inventory fell, and a 10 percent reduction in the standard cost of product was achieved.

Source: Based on Lauraine Howley, "A Strategy for Company Improvement," *Medical Device Technology* 11, no. 2 (March 2000), p. 33.

## SUMMARY

Competition is the driving force in many organizations. It may involve price, quality, special features or services, time, or other factors. To develop effective strategies for business, it is essential for organizations to determine what combinations of factors are important to customers, which factors are order qualifiers, and which are order winners.

It is essential that goals and strategies be aligned with the organization's mission. Strategies are plans for achieving organizational goals. They provide focus for decision making. Strategies must take into account present and future customer wants, as well as the organization's strengths and weaknesses, threats and opportunities. These can run the gamut from what competitors are doing, or are likely to do, to technology, supply chain management, and e-business. Organizations generally have overall strategies that pertain to the entire organization and strategies that pertain to each of the functional areas. Functional strategies are narrower in scope and should be linked to overall strategies. Time-based strategies and quality-based strategies are among the most widely used strategies business organizations employ to serve their customers and to become more productive. The chapter includes a description of the Balanced Scorecard approach, which can be helpful for transforming strategies into actions, and the implications of organization strategy for operations management.

Productivity is a measure of the use of resources. There is considerable interest in productivity both from an organizational standpoint and from a national standpoint. Business organizations want higher productivity because it yields lower costs and helps them to become more competitive. Nations want higher productivity because it makes their goods and services more attractive, offsets inflationary pressures associated with higher wages, and results in a higher standard of living for their people.

## KEY POINTS

1. Competitive pressure often means that business organizations must frequently assess their competitors' strengths and weaknesses, as well as their own, to remain competitive.
2. Strategy formulation is critical because strategies provide direction for the organization, so they can play a role in the success or failure of a business organization.

3. Functional strategies and supply chain strategies need to be aligned with the goals and strategies of the overall organization.
4. The three primary business strategies are low cost, responsiveness, and differentiation.
5. Productivity is a key factor in the cost of goods and services. Increases in productivity can become a competitive advantage.
6. High productivity is particularly important for organizations that have a strategy of low costs.

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**KEY TERMS**

**SOLVED PROBLEMS**

A company that processes fruits and vegetables is able to produce 400 cases of canned peaches in one-half hour with four workers. What is labor productivity?

$$\begin{aligned} \text{Labor productivity} &= \frac{\text{Quantity produced}}{\text{Labor hours}} = \frac{400 \text{ cases}}{4 \text{ workers} \times 1/2 \text{ hour/worker}} \\ &= 200 \text{ cases per labor hour} \end{aligned}$$

Problem 1  
  
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Solution

A wrapping-paper company produced 2,000 rolls of paper one day. Labor cost was \$160, material cost was \$50, and overhead was \$320. Determine the multifactor productivity.

$$\begin{aligned} \text{Multifactor productivity} &= \frac{\text{Quantity produced}}{\text{Labor cost} + \text{Material cost} + \text{Overhead}} \\ &= \frac{2,000 \text{ rolls}}{\$160 + \$50 + \$320} = 3.77 \text{ rolls per dollar input} \end{aligned}$$

Problem 2  
  
[mhhe.com/stevenson12e](http://mhhe.com/stevenson12e)

Solution

A variation of the multifactor productivity calculation incorporates the standard price in the numerator by multiplying the units by the standard price.

Compute the multifactor productivity measure for an eight-hour day in which the usable output was 300 units, produced by three workers who used 600 pounds of materials. Workers have an hourly wage of \$20, and material cost is \$1 per pound. Overhead is 1.5 times labor cost.

$$\begin{aligned} \text{Multifactor productivity} &= \frac{\text{Usable output}}{\text{Labor cost} + \text{Material cost} + \text{Overhead cost}} \\ &= \frac{300 \text{ units}}{(3 \text{ workers} \times 8 \text{ hours} \times \$20/\text{hour}) + (600 \text{ pounds} \times \$1/\text{pound}) + (3 \text{ workers} \times 8 \text{ hours} \times \$20/\text{hour} \times 1.50)} \\ &= \frac{300 \text{ units}}{\$480 + \$600 + \$720} \\ &= .167 \text{ units of output per dollar of input} \end{aligned}$$

Problem 3  
  
[mhhe.com/stevenson12e](http://mhhe.com/stevenson12e)

Solution

## Problem 4


[mhhe.com/stevenson12e](http://mhhe.com/stevenson12e)

A health club has two employees who work on lead generation. Each employee works 40 hours a week, and is paid \$20 an hour. Each employee identifies an average of 400 possible leads a week from a list of 8,000 names. Approximately 10 percent of the leads become members and pay a one-time fee of \$100. Material costs are \$130 per week, and overhead costs are \$1,000 per week. Calculate the multifactor productivity for this operation in fees generated per dollar of input.

## Solution

$$\begin{aligned} \text{MFP} &= \frac{(\text{Possible leads})(\text{No. of workers})(\text{Fee})(\text{Conversion percentage})}{\text{Labor cost} + \text{Material cost} + \text{Overhead cost}} \\ &= \frac{(400)(2)(\$100)(.10)}{2(40)(\$20) + \$130 + \$1,000} = \frac{\$8,000}{\$2,730} = 2.93 \end{aligned}$$

## DISCUSSION AND REVIEW QUESTIONS

- From time to time, various groups clamor for import restrictions or tariffs on foreign-produced goods, particularly automobiles. How might these be helpful? Harmful?
- List the key ways that organizations compete.
- Explain the importance of identifying and differentiating order qualifiers and order winners.
- Select two stores you shop at, and state how they compete.
- What is the Balanced Scorecard and how is it useful?
- Contrast the terms *strategies* and *tactics*.
- Contrast *organization strategy* and *operations strategy*.
- Explain the term *time-based strategies* and give three examples.
- Productivity should be a concern of every business organization.
  - How is productivity defined?
  - How are productivity measures used?
  - Why is productivity important?
  - What part of the organization has primary responsibility for productivity?
  - How is efficiency different from productivity?
- List some factors that can affect productivity and some ways that productivity can be improved.
- It has been said that a typical Japanese automobile manufacturer produces more cars with fewer workers than its U.S. counterpart. What are some possible explanations for this, assuming that U.S. workers are as hardworking as Japanese workers?
- Boeing's strategy appears to focus on its 777 midsize plane's ability to fly into smaller, nonhub airports. Rival European Airbus's strategy appears to focus on large planes. Compare the advantages and disadvantages of these two strategies.
- Name 10 ways that banks compete for customers.
- Explain the rationale of an operations strategy that seeks to increase the opportunity for use of technology by reducing variability in processing requirements.
- Identify two companies that have time-based strategies, and two that have quality-based strategies.

## TAKING STOCK

- Who needs to be involved in formulating organizational strategy?
- Name some of the competitive trade-offs that might arise in a fast-food restaurant.
- How can technology improve
  - Competitiveness?
  - Productivity?



**CRITICAL THINKING EXERCISES**

- In the past there was concern about a “productivity paradox” related to IT services. More recently, there have been few references to this phenomenon. Using the Internet, explain the term “productivity paradox.” Why do you think that the discussion of that topic has faded?
- A U.S. company has two manufacturing plants, one in the United States and one in another country. Both produce the same item, each for sale in their respective countries. However, their productivity figures are quite different. The analyst thinks this is because the U.S. plant uses more automated equipment for processing while the other plant uses a higher percentage of labor. Explain how that factor can cause productivity figures to be misleading. Is there another way to compare the two plants that would be more meaningful?
- While it is true that increases in efficiency generate productivity increases, it is possible to get caught in an “efficiency improvement trap.” Explain what this means.
- It is common knowledge that Sam’s boss Dom has been fudging the weekly productivity figures. Several employees, including Sam, have spoken to him about this, but he continues to do it. Sam has observed a drop in morale among his coworkers due to this. Sam is thinking about sending an anonymous note to Dom’s boss. Would that be ethical? What would you do if you were Sam?
- Give two examples of what would be considered unethical involving competition and the ethical principles (see Chapter 1) that would be violated.

- A catering company prepared and served 300 meals at an anniversary celebration last week using eight workers. The week before, six workers prepared and served 240 meals at a wedding reception.
  - For which event was the labor productivity higher? Explain.
  - What are some possible reasons for the productivity differences?
- The manager of a crew that installs carpeting has tracked the crew’s output over the past several weeks, obtaining these figures:

Week	Crew Size	Yards Installed
1	4	96
2	3	72
3	4	92
4	2	50
5	3	69
6	2	52

Compute the labor productivity for each of the weeks. On the basis of your calculations, what can you conclude about crew size and productivity?

- Compute the multifactor productivity measure for each of the weeks shown for production of chocolate bars. What do the productivity figures suggest? Assume 40-hour weeks and an hourly wage of \$12. Overhead is 1.5 times weekly labor cost. Material cost is \$6 per pound.

Week	Output (units)	Workers	Material (lbs)
1	30,000	6	450
2	33,600	7	470
3	32,200	7	460
4	35,400	8	480

- A company that makes shopping carts for supermarkets and other stores recently purchased some new equipment that reduces the labor content of the jobs needed to produce the shopping carts. Prior to buying the new equipment, the company used five workers, who produced an average of 80 carts per hour. Workers receive \$10 per hour, and machine cost was \$40 per hour. With the new equipment, it was possible to transfer one of the workers to another department, and equipment cost increased by \$10 per hour while output increased by four carts per hour.
  - Compute labor productivity under each system. Use carts per worker per hour as the measure of labor productivity.
  - Compute the multifactor productivity under each system. Use carts per dollar cost (labor plus equipment) as the measure.
  - Comment on the changes in productivity according to the two measures, and on which one you believe is the more pertinent for this situation.

**PROBLEMS**

5. An operation has a 10 percent scrap rate. As a result, 72 pieces per hour are produced. What is the potential increase in labor productivity that could be achieved by eliminating the scrap?
6. A manager checked production records and found that a worker produced 160 units while working 40 hours. In the previous week, the same worker produced 138 units while working 36 hours. Did the worker's productivity increase, decrease, or remain the same? Explain.
7. The following table shows data on the average number of customers processed by several bank service units each day. The hourly wage rate is \$25, the overhead rate is 1.0 times labor cost, and material cost is \$5 per customer.

Unit	Employees	Customers Processed/Day
A	4	36
B	5	40
C	8	60
D	3	20

- a. Compute the labor productivity and the multifactor productivity for each unit. Use an eight-hour day for multifactor productivity.
  - b. Suppose a new, more standardized procedure is to be introduced that will enable each employee to process one additional customer per day. Compute the expected labor and multifactor productivity rates for each unit.
8. A property title search firm is contemplating using online software to increase its search productivity. Currently an average of 40 minutes is needed to do a title search. The researcher cost is \$2 per minute. Clients are charged a fee of \$400. Company A's software would reduce the average search time by 10 minutes, at a cost of \$3.50 per search. Company B's software would reduce the average search time by 12 minutes at a cost of \$3.60 per search. Which option would have the higher productivity in terms of revenue per dollar of input?
  9. A company offers ID theft protection using leads obtained from client banks. Three employees work 40 hours a week on the leads, at a pay rate of \$25 per hour per employee. Each employee identifies an average of 3,000 potential leads a week from a list of 5,000. An average of 4 percent actually sign up for the service, paying a one-time fee of \$70. Material costs are \$1,000 per week, and overhead costs are \$9,000 per week. Calculate the multifactor productivity for this operation in fees generated per dollar of input.

## An American Tragedy: How a Good Company Died

### CASE



#### Zachary Schiller

The Rust Belt is back. So say bullish observers as U.S. exports surge, long-moribund industries glow with newfound profits, and unemployment dips to lows not seen in a decade. But in the smokestack citadels, there's disquiet. Too many machine-tool and auto parts factories are silent; too many U.S. industries still can't hold their own.

What went wrong since the heyday of the 1960s? That's the issue Max Holland, a contributing editor of *The Nation*, takes up in his nutsy-boltsy but fascinating study, *When the Machine Stopped*.\*

The focus of the story is Burgmaster Corp., a Los Angeles-area machine-tool maker founded in 1944 by Czechoslovakian immigrant Fred Burg. Holland's father worked there for 29 years, and the author interviewed 22 former employees. His shop-floor view of this small

company is a refreshing change from academic treatises on why America can't compete.

The discussions of spindles and numerical control can be tough going. But Holland compensates by conveying the excitement and innovation of the company's early days and the disgust and cynicism accompanying its decline. Moreover, the fate of Burgmaster and its brethren is crucial to the U.S. industrial economy: Any manufactured item is either made by a machine tool or by a machine made by a machine tool.

Producing innovative turret drills used in a wide variety of metal working tasks, Burgmaster was a thriving enterprise by 1965, when annual sales amounted to about \$8 million. The company needed backing to expand, however, so it sold out to Buffalo-based conglomerate Houdaille Industries Inc. Houdaille was in turn purchased in a 1979 leveraged buyout (LBO) led by Kohlberg Kravis Roberts & Co. By 1982, when debt, competition, and a sickly machine-tool market had

(continued)

\*Max Holland, *When the Machine Stopped: A Contemporary Tale from Industrial America* (Boston: Harvard Business School Press, 1988).

*(continued)*

battered Burgmaster badly, Houdaille went to Washington with a petition to withhold the investment tax credit for certain Japanese-made machine tools.

Thanks to deft lobbying, the Senate passed a resolution supporting Houdaille's position, but President Reagan refused to go along. Houdaille's subsequent attempt to link Burgmaster up with a Japanese rival also failed, and Burgmaster was closed.

Holland uses Burgmaster's demise to explore some key issues of economic and trade policy. Houdaille's charge that a cartel led by the Japanese government had injured U.S. toolmakers, for example, became a rallying point for those who would blame a fearsome Japan Inc. for the problems of U.S. industry.

Holland describes the Washington wrangling over Houdaille in painful detail. But he does show that such government decisions are often made without much knowledge of what's going on in industry. He shows, too, that Japanese producers succeeded less because of government help than because they made better, cheaper machines.

For those who see LBOs as a symptom of what ails the U.S. economy, Holland offers plenty of ammunition. He argues persuasively that the LBO crippled Burgmaster by creating enormous pressure to generate cash. As Burgmaster pushed its products out as fast as possible, he writes, it routinely shipped defective machines. It promised customers features that engineers hadn't yet designed. And although KKR disputes the claim, Holland concludes that the LBO choked off Burgmaster's investment funds just when foreign competition made them most necessary. As for Houdaille, it was recapitalized and sold to Britain's Tube Investments Group.

But Burgmaster's problems had started even before the LBO. Holland's history of the company under Houdaille is a veritable catalog of modern management techniques that flopped. One of the most disastrous was a system for computerizing production scheduling that was too crude for complex machine-tool manufacturing. Holland

gives a dramatic depiction of supply snafus that resulted in delays and cost increases.

As an independent company, "Burgmaster thrived because the Burgs knew their business," Holland writes. Their departure under Houdaille was followed by an "endless and ultimately futile search for a better formula." But, he concludes: "No formula was a substitute for management involvement on the shop floor."

In the end, however, Holland puts most of the blame for the industry's decline on government policy. He targets tax laws and macroeconomic policies that encourage LBOs and speculation instead of productive investment. He also criticizes Pentagon procurement policies for favoring exotic, custom machines over standard, low-cost models. This adds up to an industrial policy, Holland writes—a bad one.

The point is well taken, but Holland gives it excessive weight. Like their brethren in Detroit and Pittsburgh, domestic tool-makers in the 1970s were too complacent when imports seized the lower end of the product line. The conservatism that had for years served them in their cyclical industry left them ill-prepared for change. Even now some of the largest U.S. tool-makers are struggling to restructure. Blame the government, yes. But blame the industry, too.

### Questions

1. Write a brief report that outlines the reasons (both internal and external) for Burgmaster's demise, and whether operations management played a significant role in the demise.
2. Do you think that inadequate strategic planning was a factor that resulted in the company's asking for trade protection?
3. Can you think of a strategy that could have increased Burgmaster's chance of survival? Explain why you think that strategy would have been effective.

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## Home-Style Cookies

### CASE



### The Company

The baking company is located in a small town in New York State. The bakery is run by two brothers. The company employs fewer than 200 people, mainly blue-collar workers, and the atmosphere is informal.

### The Product

The company's only product is soft cookies, of which it makes over 50 varieties. Larger companies, such as Nabisco, Sunshine, and Keebler, have traditionally produced biscuit cookies, in which most of the water has been baked out, resulting in crisp cookies. The cookies have no additives or preservatives. The high quality of the cookies has enabled the company to develop a strong market niche for its product.

### The Customers

The cookies are sold in convenience stores and supermarkets throughout New York, Connecticut, and New Jersey. The company markets its cookies as "good food"—no additives or preservatives—and this appeals to a health-conscious segment of the market. Many customers are over 45 years of age, and prefer a cookie that is soft and not too sweet. Parents with young children also buy the cookies.

### The Production Process

The company has two continuous band ovens that it uses to bake the cookies. The production process is called a batch processing system. It begins as soon as management gets orders from distributors. These orders are

*(continued)*

*(continued)*

used to schedule production. At the start of each shift, a list of the cookies to be made that day is delivered to the person in charge of mixing. That person checks a master list, which indicates the ingredients needed for each type of cookie, and enters that information into the computer. The computer then determines the amount of each ingredient needed, according to the quantity of cookies ordered, and relays that information to storage silos located outside the plant where the main ingredients (flour, sugar, and cake flour) are stored. The ingredients are automatically sent to giant mixing machines where the ingredients are combined with proper amounts of eggs, water, and flavorings. After the ingredients have been mixed, the batter is poured into a cutting machine where it is cut into individual cookies. The cookies are then dropped onto a conveyor belt and transported through one of two ovens. Filled cookies, such as apple, date, and raspberry, require an additional step for filling and folding.

The nonfilled cookies are cut on a diagonal rather than round. The diagonal-cut cookies require less space than straight-cut cookies, and the result is a higher level of productivity. In addition, the company recently increased the length of each oven by 25 feet, which also increased the rate of production.

As the cookies emerge from the ovens, they are fed onto spiral cooling racks 20 feet high and 3 feet wide. As the cookies come off the cooling racks, workers place the cookies into boxes manually, removing any broken or deformed cookies in the process. The boxes are then wrapped, sealed, and labeled automatically.

## Inventory

Most cookies are loaded immediately onto trucks and shipped to distributors. A small percentage are stored temporarily in the company's warehouse, but they must be shipped shortly because of their limited shelf life. Other inventory includes individual cookie boxes, shipping boxes, labels, and cellophane for wrapping. Labels are reordered frequently, in small batches, because FDA label requirements are subject to change, and the company does not want to get stuck with labels it can't use. The bulk silos are refilled two or three times a week, depending on how quickly supplies are used.

Cookies are baked in a sequence that minimizes downtime for cleaning. For instance, light-colored cookies (e.g., chocolate chip) are baked before dark-colored cookies (e.g., fudge), and oatmeal cookies are baked before oatmeal raisin cookies. This permits the company to avoid having to clean the processing equipment every time a different type of cookie is produced.

## Quality

The bakery prides itself on the quality of its cookies. Cookies are sampled randomly by a quality control inspector as they come off the line to assure that their taste and consistency are satisfactory, and that they have been baked to the proper degree. Also, workers on the line are responsible for removing defective cookies when they spot them. The company has also installed an X-ray machine on the line that can detect small bits of metal filings that may have gotten into cookies during the production process. The use of automatic equipment for transporting raw materials and mixing batter has made it easier to maintain a sterile process.

## Scrap

The bakery is run very efficiently and has minimal amounts of scrap. For example, if a batch is mixed improperly, it is sold for dog food. Broken cookies are used in the oatmeal cookies. These practices reduce the cost of ingredients and save on waste disposal costs. The company also uses heat reclamation: The heat that escapes from the two ovens is captured and used to boil the water that supplies the heat to the building. Also, the use of automation in the mixing process has resulted in a reduction in waste compared with the manual methods used previously.

## New Products

Ideas for new products come from customers, employees, and observations of competitors' products. New ideas are first examined to determine whether the cookies can be made with existing equipment. If so, a sample run is made to determine the cost and time requirements. If the results are satisfactory, marketing tests are conducted to see if there is a demand for the product.

## Potential Improvements

There are a number of areas of potential improvement at the bakery. One possibility would be to automate packing the cookies into boxes. Although labor costs are not high, automating the process might save some money and increase efficiency. So far, the owners have resisted making this change because they feel an obligation to the community to employ the 30 women who now do the boxing manually. Another possible improvement would be to use suppliers who are located closer to the plant. That would reduce delivery lead times and transportation costs, but the owners are not convinced that local suppliers could provide the same good quality. Other opportunities have been proposed in recent years, but the owners rejected them because they feared that the quality of the product might suffer.

## Questions

1. Briefly describe the cookie production process.
2. What are two ways that the company has increased productivity? Why did increasing the length of the ovens result in a faster output rate?
3. Do you think that the company is making the right decision by not automating the packing of cookies? Explain your reasoning. What obligation does a company have to its employees in a situation such as this? What obligation does it have to the community? Is the size of the town a factor? Would it make a difference if the company was located in a large city? Is the size of the company a factor? What if it were a much larger company?
4. What factors cause the company to carry minimal amounts of certain inventories? What benefits result from this policy?
5. As a consumer, what things do you consider in judging the quality of cookies you buy in a supermarket?
6. What advantages and what limitations stem from the company's not using preservatives in cookies?
7. Briefly describe the company's strategy.

## Hazel Revisited

## CASE



(Refer to pp. 37–38 for the Hazel Case.)

1. What competitive advantage does Hazel have over a professional lawn care service?
2. Hazel would like to increase her profits, but she doesn't believe that it would be wise to raise her prices considering the current state of the local economy. Instead, she has given some thought to increasing productivity.
  - a. Explain how increased productivity could be an alternative to increased prices.
  - b. What are some ways that Hazel could increase productivity?
3. Hazel is thinking about the purchase of new equipment. One would be power sidewalk edgers. She believes edgers will lead to an increase in productivity. Another would be a chain saw, which would be used for tree pruning. What trade-offs should she consider in her analysis?
4. Hazel has been fairly successful in her neighborhood, and now wants to expand to other neighborhoods, including some that are five miles away. What would be the advantages and disadvantages of doing this?
5. Hazel does not have a mission statement or a set of objectives. Take one of the following positions and defend it:
  - a. Hazel doesn't need a formal mission statement and objectives. Many small businesses don't have them.
  - b. She definitely needs a mission statement and a set of objectives. They would be extremely beneficial.
  - c. There may be some benefit to Hazel's business, and she should consider developing one.

## "Your Garden Gloves"

## CASE



### Joseph Murray, Grand Valley State University

"Your Garden Gloves" is a small gardening business located in Michigan. The company plants and maintains flower gardens for both commercial and residential clients. The company was founded about five years ago, and has since grown substantially, averaging about 10 new clients and one new employee a year. The company currently employs eight seasonal employees who are responsible for a certain number of clients.

Each morning crews are assigned to jobs by the owner. Crew sizes range from two to four workers. Crew size and composition are a function of the square footage of the garden and requirements of the job. The owner feels that large jobs should be assigned to crews of four workers in order to complete the job in a reasonable amount of time.

From time to time, the owner noticed that some jobs, especially the largest ones, took longer than she had estimated, based on the square footage of the garden space involved. The owner's son, Joe, decided to investigate. He kept records of job times and crew sizes, and then used those records to compute labor productivity. The results were:

Crew Size	Average Productivity per Crew
2	4,234 square feet per day
3	5,352 square feet per day
4	7,860 square feet per day

The company operates on a small profit margin, so it is especially important to take worker productivity into account.

### Questions

1. Which crew size had the highest productivity per worker? Which crew size had the lowest productivity per worker? What are some possible explanations for these results?
2. After a recent storm, a customer called in a panic, saying that she had planned a garden party for the upcoming weekend and her garden was in shambles. The owner decided to send a crew of four workers, even though a two-worker crew would have a higher productivity. Explain the rationale for this decision.
3. What is a possible qualitative issue that may very well influence productivity levels that the productivity ratios fail to take into account?





*“Neither rain, nor snow . . .”*

The U.S. Postal Service (USPS) is the largest postal service in the world, handling about 41 percent (630 million pieces a day) of the world's mail volume. The second largest is Japan's, which handles only about 6 percent of the world's mail. The USPS is huge by any standard. It employs over 760,000 workers, making it the largest civilian employer in the United States. It has over 300,000 mail collection boxes, 38,000 post offices, 130 million mail delivery points, more than 300 processing plants to sort and ship mail, and more than 75,000 pieces of mail processing equipment. It handles over 100 billion pieces of first-class mail a year, and ships about 3 billion pounds of mail on commercial airline flights, making it the airlines' largest shipper.

### Processing First-Class Mail

The essence of processing the mail is sorting, which means organizing the mail into smaller and smaller subgroups to facilitate its timely delivery. Sorting involves a combination of manual and automatic operations. Much of the mail that is processed is first-class mail.

Most first-class mail is handled using automated equipment. A small portion that cannot be handled by automated equipment must be sorted by hand, just the way it was done in colonial times.

The majority of first-class mail begins at the advanced facer canceling system. This system positions each letter so that it is face up, with the stamp in the upper corner, checks to see if the address is handwritten, and pulls the hand-addressed letters off the line. It also rejects letters that have the stamp covered by tape, have no postage, are third-class mail, or have meter impressions that are too light to read. The rejects are handled manually. The remaining letters are cancelled and date stamped, and then sorted to one of seven stackers.

Next the letters go to the multiline optical character readers, which can handle both printed and pre-bar-coded mail, but not hand-addressed mail. The optical reader sprays a bar code on the mail that hasn't been pre-bar-coded, which represents up to an 11-digit zip code. For hand-addressed mail, a camera focuses on the front of the letter, and the image is displayed on a remote terminal, often in another city, where an operator views the image and provides the information that the optical readers could not determine so that a bar code can be added.

Bar-code readers then sort the mail into one of 96 stackers, doing this at a rate of more than 500 a minute. The mail goes through another sort using manually controlled mechanical equipment. At that point, the mail is separated according to whether it is local or out-of-town mail. The out-of-town mail is placed into appropriate sacks according to its destination, and moved to the outgoing send area where it will be loaded on trucks.

The local mail is moved to another machine that not only sorts the mail into local carrier delivery routes, it sorts it according to delivery walk sequence!

Small parcels, bundles of letters, and bundles of flats are sorted by a bundle-sorting machine.

### Productivity

Over the years, the USPS has experienced an ever-increasing volume of mail. Productivity has been an important factor for the USPS in keeping postal rates low and maintaining rapid delivery service. Two key factors in improved productivity have been the increased use of automation and the introduction of zip codes.

Mail processing underwent a major shift to mechanization during the 1950s and 1960s, which led to more rapid processing and higher productivity. In 1978, an expanded zip code was introduced. That was followed in 1983 by a four-digit expansion in zip codes. These changes required new, automated processing equipment, and the use of bar codes and optical readers. All of these changes added greatly to productivity. But even with these improvements, the USPS faced increasing competitive pressures.

### Competition

In the late 1980s, the USPS experienced a slowdown in the volume of mail. Some of this was due to a slowing of the economy, but most of it was the result of increasing competition. Delivery giants FedEx and UPS, as well as other companies that offer speedy delivery and package tracking, gave businesses and the general public convenient alternatives for some mail services. At the same time, there was a growing use of fax machines and electronic communications and increased use of alternate forms of advertising such as cable TV, all of which cut into the volume of mail. Early in this century, e-mail and automated bill paying also cut into mail volume.

### Strategies and Tactics Used to Make the Postal Service More Competitive

To meet these challenges, the USPS developed several strategies to become more competitive. These included reorganizing, continuing to seek ways to keep costs down, increasing productivity, and emphasizing quality and customer service. Here is an overview of the situation and the strategies and tactics used by the USPS.

The USPS began working more closely with customers to identify better ways to meet their needs and expanded customer conveniences such as stamps on consignment. With the help of business mailers, the USPS continued support for rates reflecting customer work-sharing features, many tied to automation, to give customers more flexibility. At the same time, the USPS began forming Customer Advisory Councils—groups of citizens who volunteered to work with local postal management on postal issues of interest to the community. In 1990, the USPS awarded two contracts to private firms to measure first-class mail service and customer satisfaction. In 1992, the USPS stepped up its quest to become more competitive by reducing bureaucracy and overhead in order to improve service and customer satisfaction, and to reduce the need to increase postage rates.

To help accomplish these goals, the USPS underwent a reorganization. Layers of management were eliminated and overhead positions were cut by about 30,000. Five regions and 73 field divisions were replaced by 10 areas, each with a manager for customer services and a manager for processing and distribution. Ten customer service areas were established, with managers for customer service and processing

and distribution in each area, as well as a marketing and sales office. The new structure allowed postal managers to be focused, improved communications, and empowered employees to meet customer needs. The USPS also took other steps to improve service. In 1993 it implemented improvements in processing and mail delivery at major postal facilities, expanded retail hours, and developed a more user-friendly Domestic Mail Manual. In cooperation with business customers, the USPS began to develop new services to meet specific mailer needs

and to overhaul and simplify its complex rate structure. It also awarded contracts for two more external tracking systems, one to measure satisfaction levels of business mailers, and the other to measure service performance of third-class mail.

The reorganization eliminated some programs, cut costs, attracted new business, and reduced the USPS's projected deficit.

The postal services' sustainability scorecard for 2012 is shown below.

**United States Postal Service**








**January 2012 OMB Scorecard on Sustainability/Energy**

	<p><b>Scope 1&amp;2 GHG Emission Reduction Target</b></p> <p>For Scope 1&amp;2 GHG Reduction Target of 20% by 2020: 11.1% reduction in 2011 and on track</p>		<p>Score: <b>GREEN</b></p>
	<p><b>Scope 3 GHG Emission Reduction Target</b></p> <p>For Scope 3 GHG Reduction Target of 20% by 2020: 5% reduction in 2011 and on track</p>		<p>Score: <b>GREEN</b></p>
	<p><b>Reduction in Energy Intensity</b></p> <p>Reduction in energy intensity in goal-subject facilities compared with 2003: 22.4% and on track for 30% by 2015</p>		<p>Score: <b>GREEN</b></p>
	<p><b>Use of Renewable Energy</b></p> <p>Not applicable</p>		<p>Score: <b>N/A</b></p>
	<p><b>Reduction in Potable Water Intensity</b></p> <p>Reduction in potable water intensity compared with 2007: 18.5% and on track for 26% in 2020</p>		<p>Score: <b>GREEN</b></p>
	<p><b>Reduction in Fleet Petroleum Use</b></p> <p>Reduction in fleet petroleum use compared to 2005: 6.4% <b>increase</b> and not on track</p>		<p>Score: <b>RED</b></p>
	<p><b>Green Buildings</b></p> <p>Not applicable</p>		<p>Score: <b>N/A</b></p>

(continued)

(continued)

## Standards for Success — Red Standard, Yellow Standard, Green Standard

<p><b>Scope 1&amp;2 GHG Emission Reduction Target</b></p> 	<p><b>GREEN:</b> Achieved its 2011 Sustainability Plan proposed reduction for GHG Scopes 1&amp;2 and is on track to achieve its 2020 target.</p> <p><b>YELLOW:</b> Achieved at least half of its 2011 Sustainability Plan proposed target for GHG Scopes 1&amp;2.</p> <p><b>RED:</b> Did not achieve at least half of its 2011 Sustainability Plan proposed target for GHG Scopes 1&amp;2 or did not provide trajectory for 2020.</p>
<p><b>Scope 3 GHG Emission Reduction Target</b></p> 	<p><b>GREEN:</b> Achieved its 2011 Sustainability Plan proposed reduction for GHG Scope 3 and is on track to achieve its 2020 target.</p> <p><b>YELLOW:</b> Achieved at least half of its 2011 Sustainability Plan proposed target for GHG Scope 3.</p> <p><b>RED:</b> Did not achieve at least half of its Sustainability Plan proposed target for GHG Scope 3 or did not provide trajectory for FY 2020.</p>
<p><b>Reduction in Energy Intensity</b></p> 	<p><b>GREEN:</b> Reduced energy intensity (Btu/GSF*) in EISA goal-subject facilities by at least 18 percent compared with 2003 and is on track for 30 percent reduction by 2015.</p> <p><b>YELLOW:</b> Reduced energy intensity (Btu/GSF) in EISA goal-subject facilities by at least 15 percent compared with 2003.</p> <p><b>RED:</b> Did not reduce energy intensity (Btu/GSF) in EISA goal-subject facilities by at least 15 percent compared with 2003.</p>
<p><b>Use of Renewable Energy</b></p> 	<p><b>GREEN:</b> Uses at least 5 percent electricity from renewable sources as a percentage of facility electricity use &amp; at least 2.5 percent of facility electricity use comes from new sources (post-1999). (Thermal and mechanical renewable can be included in the 2.5 percent new requirement, but not the 5 percent goal; i.e., an agency meets all new sources requirement with thermal or mechanical energy (2.5 percent) but would still need an additional 5 percent from renewable electricity sources.)</p> <p><b>YELLOW:</b> Uses at least 5 percent renewable energy from electric, thermal or mechanical sources to power facilities and equipment; but less than half was obtained from new sources (post-1999) or part of the requirement was met with thermal and mechanical renewable energy.</p> <p><b>RED:</b> Did not use at least 5 percent renewable energy from electric, thermal or mechanical sources to power facilities and equipment.</p>
<p><b>Reduction in Potable Water Intensity</b></p> 	<p><b>GREEN:</b> Reduced water intensity by at least 8 percent from final approved 2007 baseline and is on track for 26 percent reduction by 2020.</p> <p><b>YELLOW:</b> Reduced water intensity by at least 6 percent from final approved 2007 base line.</p> <p><b>RED:</b> Did not reduce water intensity by at least 6 percent from final approved 2007 baseline.</p>
<p><b>Reduction in Fleet Petroleum Use</b></p> 	<p><b>GREEN:</b> Achieved a 12 percent reduction in petroleum use in its entire vehicle fleet compared to 2005 and is on track for 20 percent reduction by 2015.</p> <p><b>YELLOW:</b> Achieved at least 10 percent reduction in petroleum use in the entire vehicle fleet compared to 2005.</p> <p><b>RED:</b> Did not achieve at least 10 percent reduction in petroleum use in its entire vehicle fleet since 2005.</p>
<p><b>Green Buildings</b></p> 	<p><b>GREEN:</b> Demonstrates implementation of Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (GP) for new, existing and leased buildings; and is on track to meet 15% goal by 2015 by reporting that at least 7% of buildings &gt;5,000 GSF meet GP as reported in the Federal Real Property Profile (FRPP).</p> <p><b>YELLOW:</b> Incorporates Guiding Principles into all new design contracts for construction, major renovations and leases and at least 7 percent of GSF of its building inventory over 5,000 GSF meets GP as reported in FRPP.</p> <p><b>RED:</b> Cannot demonstrate compliance with GP on new construction, major renovations, or leases; and/or less than 7 percent of building inventory, either by number of buildings or GSF, over 5,000 GSF meets GP as reported in FRPP.</p>

\*GSF = Gross Square Footage

### Questions

1. Why is it important for the USPS to have a high volume of mail to process?
2. What caused productivity to increase?
3. What impact did competitive pressures have on the USPS?
4. What measures did the USPS adopt to increase competitiveness?
5. What results were achieved by the USPS's changes?
6. What effect does the increased use of e-mail have on postal productivity?
7. How does the use of standard shipping containers and flat-rate mailers help competitiveness?

Source: <http://about.usps.com/what-we-are-doing/green/pdf/omb-scorecard-2012.pdf>

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**SELECTED  
BIBLIOGRAPHY  
AND FURTHER  
READINGS**

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