Chapter 15

PRODUCTION SYSTEMS FOR GLOBAL BUSINESS

15-1 Global Production Methods

15-2 Expanding Productive Activities
Mauritania’s Riches from the Sea

Have you ever tried an exotic seafood such as octopus or calamari (squid)? These foods—as well as fish, lobster, and shrimp—are important natural resources for Mauritania, a country on Africa’s Atlantic coast. The fishing grounds off the coast of Mauritania are rich with lobster, octopus, and a variety of fish.

Mauritania has a population of over 2.7 million. The country has limitations on sources of economic development because about three-fourths of the country is covered by the Sahara Desert. Minerals important to the country’s economy include iron ore, gypsum, and copper. Mauritania is a member of the Economic Community of West African States (ECOWAS).

Although always important to its economy, fishing has recently become Mauritania’s main source of foreign sales income. Production increased when the Mauritanian government entered into joint ventures with companies from other countries—including Algeria, Iraq, and Romania. These nations also share the profits. Mauritania has benefited from the sophisticated fleets used by its partners, including large trawlers capable of processing, freezing, and transporting fish without entering a port.

Think Critically

1. What natural and human resources provided a foundation for the country’s economic development?

2. In the joint fishing ventures between Mauritania and its partners, which resources are contributed by Mauritania and which are provided by the partners?

3. Conduct Web research about Mauritania to obtain additional information about the country’s business and economic environment. Prepare a report of your findings.
Diagram the basic model for all production processes.

Summarize methods of operations management.

Describe the different production methods used in various countries.

The production process is the means by which a company changes raw materials into finished goods. For example, diamond miners find rough gems below ground. The stones are cut, polished, and set before they are finally sold as bracelets, necklaces, and rings to consumers around the world.

As the word “process” suggests, the production process is composed of a series of activities. The three major elements of the production process are resources, transformation, and final goods and services. The flow of these elements is shown in Figure 15-1.

Figure 15-1: Organizations transform a combination of resources to produce goods and services that will meet consumer needs.
RESOURCES

Resources are the people and things a company uses to produce a good or service. Resources fall into one of three categories: natural resources, human resources, and capital resources.

Natural Resources  Natural resources come from the air, water, or earth. These basic elements can be used to create goods. The fishing banks off the shores of Mauritania and the diamonds of Angola are examples of natural resources. South Africa leads the world in gold mining and production. Approximately 47 percent of the gold mined in the last 100 years has come from South Africa. This precious natural resource is found in the northeastern corner of the country.

Researching a country's natural resources is vital for companies that are choosing a new site for manufacturing and identifying global business opportunities. Many countries are concerned about the depletion of their natural resources since a loss of resources means a loss of economic vitality. Recycling is one way to preserve natural resources.

Human Resources  The human resources of a country are its people and their physical and intellectual abilities. A company must research the available labor force for such characteristics as mobility, literacy rate, and culture (including traditions, gender roles, and religious beliefs). For example, India's many English-speaking workers with advanced degrees make that country an important source of labor for the information technology industry.

Capital Resources  Capital resources are the funds and materials necessary to produce a good or service. In addition to financial investment, a country's monetary system, tax structure, economic conditions, and availability of materials are all important to take into consideration when discussing the capital resources of a company.

TRANSFORMATION

Transformation is the use of resources to create a good or service. A resource may be transformed by a machine (tractor, sewing machine, or computer), by a process (statistical analysis or teaching), or through a facility (colleges, restaurants, or health clinics). Resources are often transformed through the use of machines and processes. For example, cotton harvested along the lower Nile in Egypt must be cleaned and baled. Machines process the cotton and spin it into yarn and thread. Weaving machines turn the thread into cloth.

GOODS AND SERVICES

The final stage of the production process is the output of the goods and services that have been created by the transformation activities. These goods and services are now ready to enter the market as finished products for the consumer. A fish served at a restaurant is an example of output. Its production process began with a natural resource that was harvested, transported, and prepared (transformed) for a consumer’s dining pleasure.

The production process does not end with the output of a product. Consumer response and changes in external factors (such as the economy) affect the process. Feedback from consumers and external influences affects input as the production cycle continues.
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CheckPoint

Give examples of the transformation stage of the production process.

METHODS OF OPERATIONS MANAGEMENT

Operations management is the process of designing and managing a production system. The goal of operations management is to produce a good or service at the lowest possible cost while maintaining the highest possible quality.

Forecasting Operations managers use several methods to help them design efficient production systems. Forecasting is the method used to determine how much of a product to produce. Often that decision is based on the company's previous sales. Adjustments are made for changes in consumer demand and the country's economic conditions.

Scheduling Scheduling is the time frame for producing a good or service. Operations managers consider the availability of raw materials, human resources, and facilities needed for production when they create schedules. Recently Toyota offered custom-made cars in just five days—from the time the order was received until the vehicle left the assembly line. Delivery time to the customer wasn't included in the five days. Toyota's 360 key suppliers were linked to the company by computer, creating a virtual assembly line. Parts were loaded onto trucks and delivered in the order of installation.

Inventory Control A method of monitoring the amount of raw materials and completed goods on hand is called inventory control. This count, or inventory, gives the operations manager an idea of how much to produce to meet consumer demand. One current method of inventory control is called value-added production. This occurs when a company takes a natural resource such as lumber or fresh fruits and processes the item into a finished good such as wood pulp or canned fruit.

Think Critically
1. How would a company decide whether to buy or make a part that would be used in the production process?
2. Select some natural resources. Describe actions companies could take to process these items into more useful goods.

GLOBAL BUSINESS EXAMPLE

HORIZONTAL AND VERTICAL COMPANIES

Horizontal integration takes place when a company expands its operations in a similar line of business. For example, if a food store company buys another chain of food stores, horizontal integration takes place.

In contrast, vertical integration occurs when a company expands into various stages of production and distribution. An auto manufacturer that owns its own glass company or tire manufacturer is referred to as vertically integrated.

Should a company buy the parts it uses in an assembly plant or make the component? This is not an easy question to answer. In recent years, fewer companies have been making needed production parts. Technology has allowed many small companies to specialize in various parts and offer them at a lower cost. In recent years, Sundram Fasteners Ltd., a company in India, was supplying more than 300,000 radiator caps for use in General Motors cars.

Another dimension of vertical integration has been called value-added production. This occurs when a company takes a natural resource such as lumber or fresh fruits and processes the item into a finished good such as wood pulp or canned fruit.
just-in-time (JIT). This method ties a manufacturer closely to a material supplier so that the raw materials are provided only when the production process needs them. This allows a company to respond quickly to changes in the marketplace while keeping only a small amount of inventory in stock. Warehouse costs are low, and the company is not left with unused goods at the end of the year. Goods are produced on an as-needed basis.

PRODUCTION METHODS AROUND THE WORLD

Production methods refer to the processes used during the transformation stage of production. Production methods can be categorized as manual production, automated production, or computerized production.

MANUAL PRODUCTION SYSTEMS

The manual production method involves using human hands and bodies as the means of transforming resources into goods and services. Manual production was the earliest means of production and is still a primary method of production in many parts of the world.

In some cases, as in the South African gold mines, workers perform the labor because machines are unable to do so. In other cases, manual production is considered more valuable than any other form. Handmade quilts, sweaters knitted by hand, and furniture handmade by a master carpenter are rare and more costly than their machine-made counterparts. For many developing countries, manual production is a necessity because of the initial cost of automation.

AUTOMATED PRODUCTION SYSTEMS

In automated production systems, machines perform the work. A machine offers some advantages to production. The equipment performs tasks quickly and precisely and does not get bored by repetition. Machines can do some tasks that people cannot do, such as refine oil or make plastic. In some areas of production, machines have replaced workers. Cotton that was once spun by hand is now spun by machine. This shift in production has allowed workers to direct their attention to more complex tasks.

COMPUTERIZED PRODUCTION SYSTEMS

Computerized production systems use computers to control machines and perform work in the production process. The automated factory is designed to use the latest computer technology to increase productivity. Computer-controlled equipment reduces the number of people required for manual labor, but it increases the required number of trained technicians.

Computer-Assisted Manufacturing The method of using computers to run production equipment is called computer-assisted manufacturing (CAM). Examples of CAM equipment are computerized assembly lines,
drills, and milling machines. **Computer-aided design (CAD)** uses sophisticated computers that allow a designer to develop a very detailed design and key it to the CAM equipment specifications. CAD increases the creative potential of the designer. Figure 15-2 lists a variety of computer-aided applications that are in use around the globe.

**Robotics** The name for the technology connected with the design, construction, and operation of robots is called **robotics**. Robots are simply computerized output devices that can perform difficult, repetitive, or dangerous work in industrial settings. The use of robotics has dramatically changed the appearance of many manufacturing plants. Robots carry out tasks that once posed risks for humans. Robots also can be programmed to deliver consistently precise work.

In recent years, over 1 million industrial robots were being used in Japan. This number represented over half of the world’s total. Recent robotic technology includes an ant-size robot used to inspect and repair pipes in power plants.

**Automated Warehouses** Similar to the automated factory, the automated warehouse relies on computers, software, and robotics to perform

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**COMPUTER-AIDED MANUFACTURING APPLICATIONS**

<table>
<thead>
<tr>
<th>Type of Computer-Aided Application</th>
<th>Typical Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer-aided design (CAD)</td>
<td>architectural design, interior decoration, drafting work</td>
</tr>
<tr>
<td>Computer-assisted manufacturing (CAM)</td>
<td>airplane manufacturing industry, nuclear plants, defense industry</td>
</tr>
<tr>
<td>Computer-aided engineering (CAE)</td>
<td>engineering, scientific research, highway and bridge construction</td>
</tr>
<tr>
<td>Computer-integrated manufacturing (CIM)</td>
<td>automobile production, prefabricated housing construction</td>
</tr>
</tbody>
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**Figure 15-2** Computerized production methods are in use in both goods-producing industries and service industries.
Computers store large databases of inventory information. As robots disperse merchandise to trucks for delivery, they scan a bar code, and the merchandise is automatically reordered. The repetitive functions of running a warehouse are handled by computers and robots rather than by people. Trained technicians and managers are still necessary to make sure that the warehouse stays in efficient working order.

The warehouses of companies such as Wal-Mart, eToys, Fingerhut, and other online retailers can process as many as 30,000 items an hour. While an Internet retail operation (e-tailer) can be started up fairly easily, delivering products to customers is a more complicated task. Computer programs must be developed to coordinate forklift trucks and other equipment for selecting and packing items for shipping.

**Computer-Integrated Manufacturing** As production systems evolve, manufacturers will begin to incorporate computer-integrated manufacturing (CIM). In a **computer-integrated manufacturing (CIM)** production system, computers guide the entire manufacturing process. Production is completely controlled by computer integration—from product design through processing, assembling, testing, and packaging. Two elements of a CIM production system are minimum inventories and production based on consumer demand.

Recently Ford Motor Company in Australia used a CIM software package that prepared technical illustrations of more efficient and cost-effective motor vehicles. Another feature of this software was then used to develop manufacturing instructions. In addition to designing and producing the restyled cars at the Australian Ford plant, the operational process also was used to produce vehicles at other Ford plants in Japan, Korea, and China.

**Think Critically**

1. Why do you think the regional sales representative misjudged the interest of the Rwandan company in regards to technology?

2. How did U.S. and Rwandan attitudes about technology set the communication agenda?
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REVIEW GLOBAL BUSINESS TERMS
Define each of the following terms.

1. production process
2. transformation
3. operations management
4. inventory control
5. manual production
6. automated production
7. computerized production
8. computer-assisted manufacturing (CAM)
9. computer-aided design (CAD)
10. robotics
11. computer-integrated manufacturing (CIM)

REVIEW GLOBAL BUSINESS CONCEPTS
12. What are the three main stages of the production process?
13. What is the goal of operations management?
14. What advantages do machines offer in an automated production system?

SOLVE GLOBAL BUSINESS PROBLEMS
For each of the following situations, decide if the company is making use of manual, automated, or computerized production methods.

15. Rather than cutting leather for shoes by hand, a punch press is used.
16. Hand-designed jewelry is created in large cities in Europe and Asia.
17. A chemical company plans to make use of the latest technology for handling substances that could be dangerous to human beings.
18. On an island country, hand-woven baskets are exported.
19. Light-sensitive machines produce computer components in Taiwan.

THINK CRITICALLY
20. What actions can companies and businesses take to avoid depletion of a country’s natural resources?
21. How can a country assist workers whose jobs are taken over by machinery or computers?

MAKE CONNECTIONS
22. CULTURAL STUDIES Describe how tradition might influence the use of manual production methods in a society.
23. VISUAL ART Select a product or service. Prepare a flow chart or other visual presentation showing the production process for that item.
24. TECHNOLOGY Use the Internet to research the use of robotics for doing tasks that are dangerous for humans, such as undersea exploration and handling of toxic substances.
MEASURING PRODUCTION OUTPUT

The goal of operations management is to produce a good or service at the lowest cost while maintaining the highest quality. To evaluate the production process, operations managers measure production output. Production output is measured in terms of productivity and quality control.

PRODUCTIVITY

Productivity refers to the amount of work that is accomplished in a unit of time. Productivity can sometimes be increased by making a simple change in the work pattern, such as using all of your fingers to keyboard instead of just two. At other times, an increase in productivity requires a capital investment, such as buying a new faster computer to replace an old slower one.

Operations managers want to increase productivity to get the most work possible for the cost of production investment.

One approach to productivity is the just-in-time (JIT) system of inventory control. Companies using JIT have a limited product inventory and little time delay in manufacturing.

Another approach to productivity, synchronized manufacturing, evolved from JIT. In synchronized manufacturing, the workflow is distributed as needed throughout the production cycle. The company distributes the work to all points of the manufacturing process according to output demands. The
workflow may appear to be unbalanced in this approach. For example in a shirt factory using synchronized manufacturing, the fabric-cutting department may work at 80 percent capacity due to an increase in orders. The packaging and distribution department, on the other hand, may be working at only 40 percent capacity to meet current orders.

**QUALITY CONTROL**

The second approach to measuring production output depends on quality products. To evaluate the quality of their output, companies use a method called quality control, which is the process of measuring goods and services against a product standard. By using a standard for goods and services, companies can compare their products to similar products from all over the world. Many companies employ quality control inspectors to monitor the comparison between products and standards.

**Total Quality Control (TQC)** The Japanese created an approach to quality control called total quality control (TQC). This approach requires every employee, not just the inspectors, to take responsibility for high-quality production. Many companies have reported an increase not only in their employees' work output but also in the quality of work as a result of TQC. Employees work harder because they see their value to the company's growth.

**Working in Teams** One method of improving output quality is the quality circle. A quality circle consists of a small group of workers that work together to improve the quality of their products. These groups are usually led by a quality control inspector and meet regularly to discuss problems and suggest solutions.

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**GLOBAL BUSINESS EXAMPLE**

**YOUR CAR IS FROM WHAT COUNTRY?**

Companies with a global perspective obtain production inputs and parts from many areas of the world. In recent years, Ford vehicles produced in Europe had parts from more than 20 countries. The carburetor, clutch, oil pump, and several other parts were manufactured in the United Kingdom. France provided brakes, seat pads, and hose clamps. The exhaust pipes came from Sweden, while the paint and tires came from the Netherlands. Glass and the radio were produced in Canada with the starter and other parts coming from Japan. Manufacturing facilities in Denmark provided fan belts, while the radiator and air filter came from Spain. The final assembly took place in Halewood, United Kingdom, or Saarlouis, Germany.

**Think Critically**

1. What factors influence a manufacturer's use of parts from many countries?
2. Go to the web site of Ford Motor Company to obtain additional information about the company's international production facilities.
group of employees who have different jobs within the same company but have the same goal of producing a quality good or service. For example, a quality circle at a manufacturing plant might include the project supervisor, production-line workers, an employee from distribution, and an employee from accounting. This “circle” of employees meets on a regular basis to assess how well the manufacturing process is working. They brainstorm improvements to the production cycle or to the product itself. Because they are from all areas of the plant, they can make informed decisions together. Quality circles make use of a team management style.

A team approach is often used by businesses for various company projects. A product team might be assigned to redesign a package, to reduce production costs, or to improve consumer convenience. A regional management team may be used to introduce an existing product into new global markets. Or a systems team might be asked to create a process for buying parts around the world at a lower cost.

A cross-functional team is one with members from different parts of an organization. This team is likely to include representatives from marketing, finance, information systems, and production. Each team member brings different skills and experiences. Problem solving using cross-functional teams provides solutions that take several points of view into account.

Success in working on teams involves the following skills.

- An ability to work with others who have different experiences and come from different cultural settings
- An enthusiasm to focus on team needs rather than individual accomplishments
- A readiness to cooperate with shared leadership roles
- A competency to participate in group decision making and divide tasks among team members
- A willingness to compromise for the benefit of the team’s goals

**CheckPoint**

What is a cross-functional team?
CREATING AND DELIVERING SERVICES

Service industries perform tasks rather than provide goods for consumers. A major portion of U.S. exports involves the sale of these intangible items—services. With about 70 percent of GDP in the United States coming from service industries, international trade by service industries is significant. Services provided by U.S. companies comprise over 20 percent of the world’s total cross-border sales of services.

Service industries continue to grow while new ones are being created. In recent years, some of the fastest growing service industries include telecommunications businesses (such as Internet service providers and satellite television systems), business training programs, private vocational schools, healthcare facilities, food service companies, entertainment and hospitality businesses, delivery services, and financial and banking services.

Meeting consumer needs is essential when providing a service. Tailored logistics is a strategy for meeting those needs. Companies using tailored logistics combine services with a product to better serve consumers. In recent years, McDonald’s tested an automated order taker. This machine uses pictures, text, and audio to allow people to order their food and pay without interacting with a person. The system also permits a person to regulate the

E-COMMERCE IN ACTION

Mass Customization

When the automobile was first mass-produced in the early 1900s, Henry Ford would tell potential customers they could have any color car they wanted as long as it was black! Since that time, businesses have continually attempted to meet the individual needs and wants of customers.

Today companies with millions of customers are producing products designed for the individual. Consumers can buy vitamins matched to their needs. CDs are available with selected music tracks. Cosmetics can be mixed to match a person’s skin tone. Financial service companies offer investment advice based on a person’s income, age, and household situation.

Many online companies are involved in mass customization, providing goods and services uniquely tailored to customer demand. Dell Computer only builds personal computers that have actually been ordered. This approach keeps profit margin up by keeping inventory down.

Mattel allows girls to go online to design a friend for Barbie. They can choose the doll’s skin tone, eye color, hair color, clothes, accessories, and name. The doll is delivered with a computer-generated paragraph about its personality.

Think Critically

1. Suggest situations in which companies can use technology to create products and services designed for individual needs and wants.
2. Locate a web site that allows customers to order items created for their personal situation.
condiments on a sandwich by touching plus or minus signs on the screen. Workers then deliver the food and any change to the customer. This automated order-taking system has tailored logistics to serve consumers and save costs.

**Checkpoint**

What are some of the fastest growing service industries?

**INFORMATION AND OFFICE PRODUCTION**

Technology creates continuing improvement in office environment productivity. Improved office productivity can be described as “smaller,” “faster,” “interactive,” “visually enhanced,” and “integrated.” Office machines are becoming smaller as computer technology moves from desktop to notebook to palm-held devices. Faster and less expensive technology, especially microprocessors, creates computers that process information quicker and with greater flexibility of input and output.

In addition, technological design is focusing on integrated systems. Most information processing installations combine computers with an audio system, a scanner, a DVD or CD-ROM drive, cable television, and the Internet. These systems provide a link between business information providers and other sectors, such as schools and the entertainment market.

Office workers once used telephones, typewriters, and paper and pencils. Today, office systems involve wireless networks of notebook computers along with personal digital assistants (PDAs), laser printers, scanners, fax modems, pagers, cellular phones, CD-ROMs, and other devices. These devices have increased the ability and efficiency of office workers to provide needed information for making local and global business decisions.
HISTORY: AN AFRICAN-AMERICAN OIL ENTREPRENEUR

Jake Simmons, Jr., was born in 1901 in Oklahoma, the ninth child in an African- and Native-American family of cattle ranchers. Who could have guessed he would become an international tycoon and the most successful African-American in the history of the oil industry?

Two events helped young Simmons to find success. The first was being granted 160 acres of tribal land because of his birthright as a black Creek born prior to 1907. This land provided financial security. The second event was hearing Booker T. Washington speak in 1914. Simmons followed Washington to the Tuskegee Institute in Alabama, where he studied for five years. Washington provided motivation for Simmons to take risks in his struggle to succeed.

When Simmons returned to Oklahoma, he began to broker (act as an agent in) oil leases for black landowners who had previously been cheated. Such work was risky; this was a time in U.S. history when racial segregation was enforced and lynchings were not uncommon. Simmons learned about the oil business from those real estate dealings.

In 1949, he formed the Simmons Royalty Company and began to drill for oil himself. By 1952, Simmons was a rich man, respected in both his community and in the oil business. He expanded his interests into international business when he made his first trip to Africa. He visited Liberia, a country that had just begun to permit rights to its natural resources. Simmons proposed to pay for oil exploration rights by sharing the profits made from his company.

In 1963, he was part of a U.S. trade mission to East Africa, and he became the first African-American to represent a major oil company abroad. As his peers recall, because he was an African-American, Simmons was able to interact with African leaders in a way that other oil executives could not. Contemporaries also describe him as a man of character.


Think Critically

1. What actions taken by Jake Simmons could help a person be successful in various life endeavors?
2. Conduct an Internet search for additional information about the economic and social contributions of Jake Simmons, Jr.
REVIEW GLOBAL BUSINESS TERMS

Define each of the following terms.

1. productivity
2. synchronized manufacturing
3. quality control
4. total quality control (TQC)
5. quality circle
6. tailored logistics

REVIEW GLOBAL BUSINESS CONCEPTS

7. How can production output be measured?
8. How do service industries differ from manufacturing industries in their production processes?
9. How is information processing and office productivity changing?

SOLVE GLOBAL BUSINESS PROBLEMS

Balancing trade with the protection of natural resources is important. In some African countries, trade in tropical timber is restricted. Governments place heavy tariffs on exported finished-wood products. Yet these countries strive to develop their economies. A proposal in Uganda suggested lifting tariffs on finished-wood products such as furniture, since these items have a higher market value than raw timber. African countries could maintain their income levels while harvesting fewer trees.

10. What changes in input and transformation of the production process of timber would occur?
11. Which production method (manual, automated, or computerized) would make the proposal most feasible?
12. Do you think this proposal would enable the African countries to increase their profits from tropical timber? Why or why not?

THINK CRITICALLY

13. List objections that employees might have to working on cross-functional teams.
14. Measuring quality of services is more difficult than measuring manufactured goods. What are some ways in which a business could assess the quality of service provided?

MAKE CONNECTIONS

15. **MATH** Without quality control, small numbers of defective products can result in large business expenses. A manufacturing company produces 1.2 million computer chips a month, costing $7 each. Currently, 1.5 percent of these are defective each month. How much would the company save each month if the rate of defective items could be reduced to 0.6 percent?

16. **ECONOMICS** Why are more personal and business services offered in developed economies than in less-developed economies?
Chapter 15 ASSESSMENT

CHAPTER SUMMARY

5-1 GLOBAL PRODUCTION METHODS

A. The production process changes raw materials into finished goods and services. The three elements in the production process are resources, transformation, and goods and services.

B. The goal of operations management is to produce a good or service at the lowest possible cost while maintaining the highest possible quality. Operations managers use forecasting, scheduling, and inventory control to manage the process.

C. The production methods used in global business are manual production, automated production, and computerized production.

15-2 EXPANDING PRODUCTIVE ACTIVITIES

A. Production output might be measured in terms of productivity and quality control. Productivity is the amount of work that is accomplished in a unit of time. Quality control measures goods and services produced against a product standard.

B. Creating services involves performing tasks that provide value to consumers and businesses. Services are about 70 percent of U.S. GDP and a major portion of global sales.

C. Technology influences office activities through improved productivity resulting from faster and more efficient equipment and systems.

GLOBAL REFOCUS

Read the Global Focus at the beginning of this chapter, and answer the following questions.

1. Which production systems have been used in Mauritania’s production of seafood?

2. How have changes in technology contributed to Mauritania’s success in the fishing industry?
REVIEW GLOBAL BUSINESS TERMS
Match the terms listed with the definitions. Some terms may not be used.

1. The means by which a company changes raw materials into finished goods.
2. A method of production in which machines perform the work.
3. The use of resources to create a good or service.
4. The process of designing and managing a production system.
5. A measurement of the amount of work that is accomplished in a unit of time.
6. A method of production using computers to control machines and perform work.
7. The process of measuring goods and services against a product standard.
8. A method of monitoring the amount of raw materials and completed goods on hand.
9. A method of production that involves using peoples’ hands and bodies as the means of transforming resources into goods and services.
10. A production system in which computers guide the entire manufacturing process, from product design through processing, assembly, testing, and packaging.
11. A small group of employees who have different jobs within the same company but have the same goal of producing a quality good or service.
12. The technology that designs, constructs, and operates devices that can perform difficult, repetitive, or dangerous work.

MAKE GLOBAL BUSINESS DECISIONS

13. A region’s production opportunities are often determined by its natural resources. Which of your state’s natural resources have been used to encourage business in your state? Are any of the natural resources unique to your state? If so, what has that meant for production in your state?

14. As a consumer of a particular product, how would you suggest tailoring the product to better serve consumer demands?

a. automated production
b. computer-aided design (CAD)
c. computer-assisted manufacturing (CAM)
d. computer-integrated manufacturing (CIM)
e. computerized production
f. inventory control
g. manual production
h. operations management
i. production process
j. productivity
k. quality circle
l. quality control
m. robotics
n. synchronized manufacturing
o. tailored logistics
p. total quality control (TQC)
q. transformation
Chapter 15 ASSESSMENT

15. What effects do you think robotics and computer-integrated manufacturing (CIM) will have on U.S. business during the next two decades?

16. What production methods do you and others use to accomplish daily tasks at home, school, or work? List examples for each method used.

17. What actions might be taken by a company to improve quality?

18. Prepare a list (with job descriptions) of roles that might be assumed by team members working on a project, such as team leader and recorder.

19. How can a person prepare to have the skills necessary for employment in the future as technology changes the types of jobs that are in demand?

20. Describe safety situations and other reasons that a country might continue to use manual production methods rather than automated or computerized ones.

GLOBAL CONNECTIONS

21. GEOGRAPHY Identify companies that contribute significantly to your local economy. Are these organizations manufacturing or service businesses? Which resources (natural, human, or capital) may have attracted these companies to your area?

22. COMMUNICATIONS Choose a company, and obtain information from library research or the Internet about its production activities. Create a flow chart of the production process of this company. Include the resources used in input, the activities involved in transformation, and the goods and services produced as output.

23. CULTURAL STUDIES Describe how cultural differences might affect team project activities of a group of workers from different countries.

24. SCIENCE Interview a person who is involved with manufacturing about production processes used in his or her business. What natural resources and scientific principles are used by this organization? What possible health and safety concerns might be encountered in various countries around the world?

25. MATHEMATICS Research methods used to measure production output. What numeric standards are used to measure productivity? How is quality control maintained?

26. CAREER PLANNING Conduct library research about the technology used in different countries. Prepare a list of computer and technology skills that office workers and other employees should possess for career success.

27. GEOGRAPHY Choose a country. Use the Internet to identify five natural resources the country supplies to the rest of the world.

28. TECHNOLOGY Use the Internet to identify companies with operations that have horizontal integration and vertical integration.

29. TECHNOLOGY Use the Internet to online resources for computer-assisted manufacturing and computerized production systems.
Based on the company you have been using in this continuing project or on a new idea for your business, obtain information related to the following elements of production planning.

1. List natural resources needed for this enterprise.
2. Describe the human resources of the organization.
3. List capital resources necessary for providing the good or service.
4. Prepare a visual presentation of the production process. (Describe how manual, automated, or computerized production will be used.)
5. Describe what types of technology the company will use.
6. Describe types of items (parts, supplies, finished goods) will be kept in inventory.
7. Describe factors will be used to measure productivity.
8. Describe actions could be taken to assure quality control.

Prepare a written summary or present a short oral report (two or three minutes) of your findings.
Implement International Business Operations

The information systems and production activities of businesses vary significantly around the world. While these differences are frequently the result of the level of economic development, history and culture may also affect these business operations. Cross-cultural teams, with people from around the world, can add to the efficiency of a company’s information processing and manufacturing.

GOAL
To identify regional differences for planning and implementing information systems and manufacturing facilities.

ACTIVITIES
Working in teams, select a geographic region you will represent—Africa, Asia, Europe, Latin America, the Middle East, or North America.
1. To research information processing and manufacturing in your region, consider doing the following: conduct a web search, use library resources, and, if possible, talk to people who have lived or visited that area of the world.
2. Identify the extent to which computers are used in various countries in your region.
3. Explain common information processing procedures used by companies in your geographic region. How does the availability of information improve the efficiency of business activities?
4. Describe common production activities in some countries in your region. What benefits and concerns are associated with these factories?
5. Evaluate how technology is used in production activities for several countries in the region. What are some of the limitations of using technology in this area of the world?
6. Global Business Decision Your team has been assigned the task of selecting a location for a production facility. This manufacturing plant will make automobile parts for vehicles assembled in the United Kingdom, United States, Japan, Germany, Mexico, and Brazil. Compare your findings with those of others on your team and decide which region would be the best location for this factory. What factors need to be considered when making this decision?

TEAM SKILL
Cross-Cultural Team Leadership
Leadership has a significant influence on the success of a team. Describe the skills of team leaders valued in your geographic region. Do any of these competencies differ from those of effective team leaders in other regions?

PRESENT
Create a flowchart or other visual presentation to communicate the types of information systems and production facilities found in your geographic region.
Human Resource Management

Successful business people are faced with tough decisions that may involve relocation to another country. Frequently individuals who move up the company ranks are promoted to positions that involve international travel or relocation to another country. While promotion within a country is a strong incentive, moving to another part of the world becomes challenging. All factors must be given careful consideration before an employee agrees to relocate to another country.

Your company plans to expand its operations to Mexico. The success of this expansion depends on top managers relocating from the United States to Mexico.

Many of your top managers are hesitant to relocate to Mexico due to cultural, economic, and language concerns. Most of your top managers have young families who attend good schools in the U.S. Some of the managers only speak English.

The human resource department (you) is challenged to develop a compensation package that is attractive enough for managers to relocate to Mexico. Top concerns of the managers include salary, schools, language barriers, economic challenges, moving costs, and quality of life.

PERFORMANCE INDICATORS EVALUATED
- Demonstrate knowledge of human resources management and management concepts.
- Apply critical thinking skills to interpret personnel policies.
- Demonstrate effective oral communication skills.
- Demonstrate understanding of human relations skills.
- Discuss compensation, benefits, and incentive programs.

For more detailed information about performance indicators, go to the BPA web site.

THINK CRITICALLY
1. Why is salary not necessarily the top concern for managers you wish to relocate?
2. What five items do you feel are most important to include in the manager compensation package? Why?
3. What will you offer managers who want their young children to attend the best private schools?
4. Outline your compensation package. Make sure to include all benefits and allowances for moving costs and travel to/from the U.S.

www.bpa.org/
IF YOU WERE THERE

As your four-wheel-drive truck struggles up the bank of yet another river crossing, the mountain village of Bocay is just around the next bend in the narrow road. From here, you will begin the 70-mile canoe trip down the Río de Bocay to the Sumu village.

You see the village stretching along the bank of a muddy river. Its 1,800 people live in two-room boxlike houses along the road. The walls are wood, the roofs are tin, and the floors are dirt. There is no plumbing, but there is talk of having electricity in a few months. A family shares some of its rice and beans with you and offers you a place to sleep on the floor. Your anthropology classes did not prepare you emotionally for this culture that is so different from your own.

The 1,800 Sumus who live in five villages along the Río de Bocay are having a difficult time surviving. Their bamboo huts contain just a few pots and maybe some rice and beans. They wear secondhand clothes from North America. However, the Sumus are in the process of setting up a cooperative business in each village. The Sumu will make crafts from the wood found in the forest, and the villagers will cooperatively sell these products in markets such as Bocay.
Mayan and Incan Empires

The Mayan Empire extended over several areas of Central America between A.D. 250 and A.D. 900. Mayan culture centered around religion and ceremony. Mayan cities contained great temple-pyramids, which attracted large crowds during festivals. The study of astronomy and mathematics was essential to Mayan religion.

Another of the great empires of Latin America was the Incan Empire, whose ruins of Machu Picchu in the Andes Mountains of Peru attract visitors from all over the world. The Incan Empire extended from the northern border of modern Ecuador to central Chile. Its 10-12 million inhabitants enjoyed the benefits of the strong central government in return for helping with the construction of public buildings and roads. The important buildings were plated in gold. In 1532, the Spanish, led by the conquistador Francisco Pizarro, captured the Incan Emperor Atahualpa. Atahualpa was murdered by the Spanish in 1533, leaving the Incan people without a leader.

Colonization

The colonization of Central and South America was based on an economic system known as mercantilism—in which a nation’s power depended on its accumulation of wealth. Portuguese and Spanish ships carried away great quantities of gold, silver, and other raw materials to the parent countries. In turn, the colonies served as markets for manufactured exports. The Native Americans were forced to work the mines and plantations. Later, when European diseases significantly reduced the Indian population, Africans were enslaved and imported.

During the colonial period (1521-1820), approximately 5,400 Spanish and Portuguese immigrated to Latin America each year. These immigrants developed a society based on their European heritage, but also one that was influenced by cultural aspects of their new environment. They brought Roman Catholicism to the colonies, and it remains the dominant religion today.

Struggle for Independence

In the early 1800s, the nationalist leaders Simón Bolívar, José de San Martin, and Bernardo O’Higgins led wars of independence from Spanish rule. However, the liberal Portuguese King João VI, who fled to Brazil after Napoléon invaded his country,
fostered Brazilian independence from Portugal. He then declared the colony’s independ-
ence as a means to retaining his royal sovereignty.

Traditionally, wealthy landowners, merchants, and the military have controlled Latin American governments since independence. Governments were frequently overthrown by the army in an attempt to gain power or to protect the wealth and power of the ruling class. Those who spoke up for the poor were often assassinated. In 1991 and 1992, coup attempts occurred in Guatemala, Haiti, Venezuela, and Peru.

Geography

The Andes Mountains and their snowcapped peaks extend almost 4,500 miles from Venezuela to the tip of South America, dominating the topography of the western part of the continent. Inland plains spread from Venezuela south through Brazil, Paraguay, Uruguay, and Argentina. A vast desert region in Peru and Chile is one of the driest areas in the world. Rain forests are common in areas of Central America; the Amazon basin rain forest takes up one-third of South America. The longest river in the Western Hemisphere is the Amazon. It flows 4,000 miles across the continent before pouring its vital nutrients into the ocean, enriching sea life as far away as the Grand Banks of Newfoundland.

Ethnic Groups

The ethnic groups of Central and South America are as diverse as the land. African, Asian, Middle Eastern, European, Native American, Mestizo (Native American-European), and Mulatto (European-African) all live together in this region.

Industries

Farming and mining continue to be the most important industries in Latin America. Coffee, sugar, bananas, wheat, cotton, and cacao are exported. However, the region still has difficulty feeding its people because of a growing population and primitive farming methods. A few countries produce oil and natural gas. Most countries mine mineral resources such as iron, tin, copper, silver, lead, and gold. Brazil ranks in the top ten countries for world gold production.
Economic Growth

Future economic growth will depend on industrial development. Many governments are looking to their sparsely populated interiors for hydroelectric power to run factories and offices. The interiors are also rich in timber and could provide farms for the millions of hungry, landless peasants. Rain forests are essential to the global environment and must be preserved. The wild rivers attract tourists, and the rain forest is home to many indigenous people. The rain forests contain an abundance of animal and plant species, which are possible sources of medicines.

Latin American nations are under pressure to protect the environment at the expense of industrial development. The northern countries continue to consume and pollute. The population of Latin America could double in the next 20 to 25 years, and governments will be hard-pressed to fill basic food, housing, health, and education needs for their people. These social, economic, and health problems are all interrelated, and their solutions might be found by those regional and global problem solvers who comprehend just how interdependent we are.

Think Critically

1. How does having a government consisting of wealthy officials and military personnel affect the citizens of a country?
2. How do North American consumption trends affect the rain forests in Central and South America?
3. Why is industrial development essential for the economic growth of this region?
4. Use the library or do an Internet search to determine how many and what kinds of species are estimated to exist in the Amazon River area. What kinds of medical uses have already been discovered for some of these species?
## COUNTRY PROFILE/CENTRAL AND SOUTH AMERICA

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<th>GDP (billions)</th>
<th>Exports per capita (thousands)</th>
<th>Imports (billions)</th>
<th>Monetary Unit</th>
<th>Inflation (percent)</th>
<th>Unemployment (percent)</th>
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