Operations Management 13th edition Krajewski Test Bank

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Operations Management: Processes and Supply Chains, 13e **(Krajewski)**
Chapter 1 Using Operations to Create Value

1.1 Role of Operations in an Organization

1) Operations management refers to the direction and control of inputs that transform processes into products and services.
Answer: TRUE
Difficulty: Easy
Keywords: operations management, inputs, process, transformation
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

2) An operation is a group of resources performing all or part of one or more processes.
Answer: TRUE
Difficulty: Easy
Keywords: operations management, inputs, process, transformation
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

3) The three main line functions of any business include Operations, Finance and Marketing.
Answer: TRUE
Difficulty: Easy
Keywords: operations, finance, marketing
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

4) The scope of supply chain management is restricted to the synchronization of the process among the various business functions within the firm.
Answer: FALSE
Difficulty: Easy
Keywords: supply chain management, processes
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

5) Regardless of how departments like Accounting, Engineering, Finance, and Marketing function in an organization, they are all linked together through:
A) management.
B) processes.
C) customers.
D) stakeholders.
Answer: B
Difficulty: Moderate
Keywords: departments, functions, processes
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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6) The foundations of modern manufacturing and technological breakthroughs were inspired by the creation of the mechanical computer by:
A) Charles Babbage.
B) James Watt.
C) Eli Whitney.
D) Frederick Taylor.
Answer: A
Difficulty: Moderate
Keywords: Charles Babbage
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

7) Which of these Great Moments in Operations and Supply Chain Management did not occur in the twentieth century?
A) invention of the assembly line
B) publication of the Toyota Production Systems book
C) establishment of railroads
D) strategic planning for achieving product variety
Answer: C
Difficulty: Moderate
Keywords: history, railroad
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

8) The three main line functions of any business include:
A) operations.
B) marketing.
C) finance.
D) information systems.
E) all of the above
F) only A), B) and C) above
Answer: F
Difficulty: Moderate
Keywords: operations, finance, marketing
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

9) Operations management refers to the systematic design, direction, and control of _____ that transform _____ into products and services.
Answer: processes, inputs
Difficulty: Moderate
Keywords: process, input, transform, product, service
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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10) The three mainline functions of any business are _____, _____, and _____.
Answer: operations, finance, marketing
Difficulty: Moderate
Keywords: operations, finance, marketing, functions of a firm
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

11) Supply chain management is the synchronization of a firm's processes with those of its _____ and _____ to match the flow of materials, services, and information.
Answer: suppliers, customers
Difficulty: Moderate
Keywords: supply chain management, suppliers, customers
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

12) What are the three key functions of a firm and what is each responsible for?
Answer: The three main functions of a firm are operations, finance, and marketing. The operations function transforms material and service inputs into product and service outputs. The finance function generates resources, capital and funds from investors and sales of the firm's goods and services in the marketplace. The marketing function is responsible for producing sales revenue of the outputs.
Difficulty: Moderate
Keywords: manufacturing process, service process
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Describe the role of operations in an organization and its historical evolution over time.

1.2 A Process View

1) A process involves transforming inputs into outputs.
Answer: TRUE
Difficulty: Easy
Keywords: process, inputs, outputs
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

2) Every process has a customer.
Answer: TRUE
Difficulty: Easy
Keywords: process, customer relationship
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

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3) Departments within a firm typically have a common set of objectives, and share resources among them to achieve those objectives.
Answer: FALSE
Difficulty: Moderate
Keywords: functions, departments
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

4) At the level of the firm, service providers offer just services and manufacturers offer just products.
Answer: FALSE
Difficulty: Moderate
Keywords: manufacturing, service, similarity, goods, services
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

5) The outputs of service processes typically cannot be held in a finished goods inventory.
Answer: TRUE
Difficulty: Easy
Keywords: manufacturing, service, similarity, goods, services
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

6) Manufacturing processes tend to be capital intensive.
Answer: TRUE
Difficulty: Easy
Keywords: manufacturing process, service process, capital intensive, labor intensive
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

7) Quality is more easily measured in a service process than in a manufacturing process.
Answer: FALSE
Difficulty: Moderate
Keywords: manufacturing process, service process, quality
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

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8) Contact with the customer is usually higher in a manufacturing process than in a service process.
Answer: FALSE
Difficulty: Easy
Keywords: manufacturing process, service process, customer contact
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

9) The outputs from manufacturing processes can be produced, stored, and transported in anticipation of future demand.
Answer: TRUE
Difficulty: Easy
Keywords: manufacturing, service, similarity, goods, services
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

10) Which of these statements about processes is *not* true?
A) A process can have its own set of objectives.
B) A process can involve work flow that cuts across departmental boundaries.
C) A process can require resources from several departments.
D) A process can exist without customers.
Answer: D
Difficulty: Moderate
Keywords: process, customer relationship
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

11) Operations management is part of a production system that can be described in the following manner:

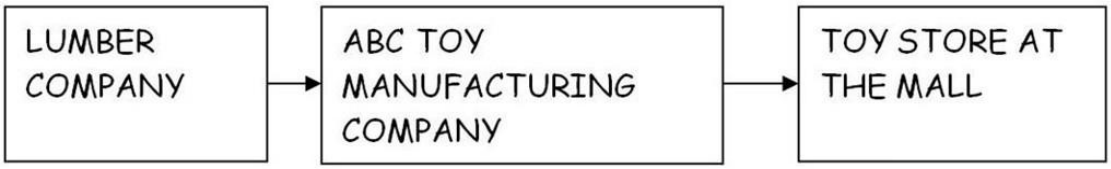
Organization: inputs→processes→outputs.

Which one of the following correctly describes a production system?
A) Airline: pilots→planes→transportation
B) Bank: tellers→computer equipment→deposits
C) Furniture manufacturer: wood→sanding→chair
D) Telephone company: satellites→cables→communication
Answer: C
Difficulty: Moderate
Keywords: production system, input, process, output
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Reflective Thinking
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

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Figure 1.1
You are the Production Manager for the toy manufacturing process at the ABC Company.



12) Use the information provided in Table 1.1. An example of an internal customer is:
A) the lumber company.
B) the Receiving Department at ABC.
C) the Shipping Department at ABC.
D) the toy store at the mall.
Answer: C
Difficulty: Moderate
Keywords: internal customer
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Reflective Thinking
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

13) Use the information provided in Table 1.1. An example of an internal supplier is:
A) the lumber company.
B) the Receiving Department at ABC.
C) the Shipping Department at ABC.
D) the toy store at the mall.
Answer: B
Difficulty: Moderate
Keywords: internal supplier
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Reflective Thinking
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

14) Use the information provided in Table 1.1. An example of an external customer is:
A) the lumber company.
B) the Customer Service Department at ABC.
C) the Shipping Department at ABC.
D) the toy store at the mall.
Answer: D
Difficulty: Moderate
Keywords: external customer
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Reflective Thinking
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

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15) Use the information provided in Table 1.1. An example of an external supplier is:
A) the lumber company.
B) the Receiving Department at ABC.
C) the Customer Service Department at ABC.
D) the toy store at the mall.
Answer: A
Difficulty: Moderate
Keywords: external supplier
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Reflective Thinking
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

16) Which of the following is an example of a nested process?
A) At the start of the new semester, a student first pays tuition and then goes to the bookstore.
B) A customer service representative verifies a caller's account information.
C) A candidate's intent to graduate is checked for financial holds by the Bursar and for degree requirements by Advising before the diploma mill prints their sheepskin.
D) A stockbroker calls a client and advises her to sell silver short.
Answer: C
Difficulty: Easy
Keywords: nested process
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

17) Which of the following statements is more of a general characteristic of a manufacturing organization, as compared to a service organization?
A) Short-term demand tends to be highly variable.
B) Operations are more capital intensive.
C) Outputs are more intangible.
D) Quality is more difficult to measure.
Answer: B
Difficulty: Moderate
Keywords: manufacturing organization, service organization, capital intensity
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
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18) Which one of the following statements is more of a general characteristic of a service organization, as compared to a manufacturing organization?
A) Output can be inventoried.
B) The response time is longer.
C) There is less customer contact.
D) Quality is not easily measured.
Answer: D
Difficulty: Moderate
Keywords: manufacturing organization, service organization, facilities
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

19) Manufacturing processes usually have:
A) physical, durable output.
B) high levels of customer contact.
C) output that cannot be inventoried.
D) low levels of capital intensity.
Answer: A
Difficulty: Moderate
Keywords: manufacturing organization, service organization, physical output
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

20) Service processes usually have:
A) physical, durable output.
B) low levels of customer contact.
C) output that can be inventoried.
D) shorter response times.
Answer: D
Difficulty: Moderate
Keywords: manufacturing organization, service organization, capital intensity
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

21) A(n) _____ is any activity or group of activities that takes one or more inputs, transforms and adds value to them, and provides one or more outputs for its customers.
Answer: process
Difficulty: Moderate
Keywords: process, activity, input, value
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
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22) Service processes tend to produce _____, _____ outputs.
Answer: intangible, perishable
Difficulty: Moderate
Keywords: manufacturing, service, similarity, goods, services
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

23) List and briefly describe five differences between services and manufacturing. Processes provide examples to illustrate your arguments.
Answer:

Manufacturing Processes	**Service Processes**
Physical, durable products	Intangible, perishable products
Output can be produced, stored, and transported	Can't be stored and transported
Low customer contact	Customers can be part of the input and part of the process
Have days to deliver	Must be offered within minutes
Capital intensive	Labor intensive
Quality easily measured	Quality not easily measured

Examples will vary.
Difficulty: Moderate
Keywords: manufacturing process, service process
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

24) Identify a large employer in your hometown. Describe this organization's inputs, processes, and outputs.
Answer: Answers will vary based on the employer selected.
Difficulty: Moderate
Keywords: input, process, output
Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services
AACSB: Application of Knowledge
Learning Objective: Describe the process view of operations in terms of inputs, processes, outputs, information flows, suppliers, and customers.

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1.3 A Supply Chain View

1) The customer relationship process includes the activities required to produce and deliver the service or product to the external customer.
Answer: FALSE
Difficulty: Moderate
Keywords: customer relationship process, order fulfillment process
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

2) The supplier relationship process selects the suppliers of services, materials and information, while the order fulfillment process facilitates the timely and efficient flow of these items into the firm.
Answer: FALSE
Difficulty: Moderate
Keywords: supplier relationship, process, order fulfillment process
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

3) One distinction between core processes and support processes is that core process can cut across the organization while support processes do not.
Answer: FALSE
Difficulty: Moderate
Keywords: core process, process analysis
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

4) A set of activities that delivers value to external customers is a:
A) supply chain.
B) core process.
C) support process.
D) system.
Answer: B
Difficulty: Moderate
Keywords: activity, core process
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

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5) Budgeting, recruiting, and scheduling are examples of a:
A) development.
B) core process.
C) support process.
D) system.
Answer: C
Difficulty: Moderate
Keywords: activity, support process
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

6) The process that facilitates the placement of orders and identifies, attracts, and builds relationships with external customers is called the:
A) customer relationship process.
B) new service development process.
C) order fulfillment process.
D) supplier relationship process.
Answer: A
Difficulty: Moderate
Keywords: process, customer relationship
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

7) The process that includes the activities required to produce and deliver the service or product to the external customer is called the:
A) customer relationship process.
B) new service development process.
C) order fulfillment process.
D) supplier relationship process.
Answer: C
Difficulty: Moderate
Keywords: process, order fulfillment
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

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8) The process that that selects the suppliers of services, materials, and information and facilitates the timely and efficient flow of these items into the firm is called the:
A) customer relationship process.
B) new service development process.
C) order fulfillment process.
D) supplier relationship process.
Answer: D
Difficulty: Moderate
Keywords: process, supplier relationship
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

9) The cumulative work of the processes of a firm is a(n) _____.
Answer: supply chain
Difficulty: Moderate
Keywords: processes, supply chain
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

10) _____ provide vital resources and inputs to core processes.
Answer: Support processes
Difficulty: Moderate
Keywords: support process, core process
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Describe the supply chain view of operations in terms of linkages between core and support processes.

1.4 Operations Strategy

1) A firm's core competencies reflect the collective learning of the organization, especially in how to coordinate processes and integrate technologies.
Answer: TRUE
Difficulty: Easy
Keywords: core competency, core process
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

2) Firm A wants to enter a foreign market and has a skill that is difficult to duplicate. Firm B desires this skill, so Firm A works with Firm B in an arrangement known as a joint venture.
Answer: FALSE
Difficulty: Moderate
Keywords: strategic alliance
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

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3) The framework for carrying out all of an organization's functions is:
A) the competitive priority.
B) the corporate strategy.
C) the market analysis.
D) the organizational design.
Answer: B
Difficulty: Moderate
Keywords: corporate strategy
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

4) Which element of a firm's core competency is particularly important in service organizations, where customers come in direct contact with employees?
A) workforce
B) facilities
C) market knowledge
D) systems and technology
Answer: A
Difficulty: Moderate
Keywords: core competency, strategy
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

5) A company realizes that recent layoffs at its primary company reflect potential falling demands for its customers' products, and hence for its own products. The company has engaged in:
A) flow strategy.
B) market segmentation.
C) mission statement redefinition.
D) environmental scanning.
Answer: D
Difficulty: Moderate
Keywords: environmental scanning
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

6) Core competencies are:
A) product or service attributes that represent the needs of a particular market segment.
B) another name for competitive priorities.
C) various flow strategies.
D) the unique resources and strengths that management considers when formulating strategy.
Answer: D
Difficulty: Moderate
Keywords: core competency, strategy
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

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7) Which of the following is an example of a core competency?
A) flexibility
B) top quality
C) low-cost operations
D) systems and technology
Answer: D
Difficulty: Moderate
Keywords: core competency
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

8) Price, quality, and the degree of customization are all examples of:
A) volume needs.
B) other needs.
C) product needs.
D) delivery system needs.
Answer: C
Difficulty: Moderate
Keywords: needs assessment
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

9) The Gap, Inc. has targeted teenagers and young adults in need of casual clothes, and through its GapKids stores, the parents or guardians of infants through 12-year-olds. This is an example of:
A) market segmentation.
B) a collaborative effort between the company and its customers.
C) a needs assessment.
D) a mission statement.
Answer: A
Difficulty: Moderate
Keywords: market segmentation
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

10) One form of strategic alliance is the _____, in which two firms agree to cooperate to produce a product or service together.
Answer: joint venture
Difficulty: Moderate
Keywords: joint alliance
Learning Outcome: Compare common approaches to supply chain design
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

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11) The process by which managers monitor trends in the external business environment for potential opportunities or threats is known as _____.
Answer: environmental scanning
Difficulty: Moderate
Keywords: environmental scanning, strategy
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

12) What are the four core processes in a firm and how are they related?
Answer: The customer relationship process identifies, attracts, and builds relationships with external customers and facilitates the placement of orders. The order fulfillment process includes activities required to produce and deliver the service or product to the external customer. The new service/product development process designs and develops new services or products, which may be to customer specifications. The supplier relationship process selects the suppliers of services, materials, and information and facilitates the flow of these items into the firm. All of these processes exist to provide a service or product to the customer.
Difficulty: Moderate
Keywords: core process, customer relationship, service/product development, order fulfillment, supplier relationship
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define an operations strategy and its linkage to corporate strategy and market analysis.

1.5 Competitive Priorities and Capabilities

1) Competitive priorities are the means by which operations implements the firm's corporate strategies.
Answer: FALSE
Difficulty: Moderate
Keywords: competitive priority, corporate strategy
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

2) Development speed for new product and service introductions is a possible competitive priority for operations management.
Answer: TRUE
Difficulty: Easy
Keywords: time, competitive priority
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

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3) A firm once made purchasing decisions based on which supplier had the lowest cost. But once cash flow was healthy, purchasing decisions were made based on the fastest delivery of goods and services by firms. In this case, delivery speed is clearly the order qualifier.
Answer: FALSE
Difficulty: Moderate
Keywords: competitive priority, order qualifier
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

4) Volume flexibility is handling a wide assortment of products or services efficiently.
Answer: FALSE
Difficulty: Moderate
Keywords: variety, volume flexibility
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

5) Admission to the prestigious school had become so competitive that a high GPA is no longer enough to separate one fresh-faced high school student from another. Today's outstanding candidate must also demonstrate their involvement in a myriad of extracurricular activities in order to be admitted. It seems that good grades are now:
A) a needs assessment.
B) order qualifiers.
C) order winners.
D) a mission statement.
Answer: B
Difficulty: Easy
Keywords: order qualifier
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Reflective Thinking
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

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6) The first three cars I bought all fell apart around 50,000 miles. It was called planned obsolescence and no one seemed to care until companies entered the market that promised 70,000, then 80,000, and finally 100,000 mile warranties. What sets a great car apart from a good one now is not the quality, which is assumed, but performance, safety and fuel economy. A car that can achieve all three is highly sought after. In the automotive market, performance, safety and fuel economy are sterling examples of:
A) order winners.
B) a needs assessment.
C) order qualifiers.
D) a mission statement.
Answer: A
Difficulty: Easy
Keywords: order winner
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Reflective Thinking
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

7) You are interested in buying a laptop computer. Your list of considerations include the computer's speed in processing data, its weight, screen size, and price. You consider a number of different models, and narrow your list based on speed and monitor screen size, then finally select a model to buy based on its weight and price. In this decision, weight and price are examples of:
A) order qualifiers.
B) a needs assessment.
C) order winners.
D) a mission statement.
Answer: C
Difficulty: Easy
Keywords: order winner
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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8) You are interested in buying a laptop computer. Your list of considerations include the computer's speed in processing data, its weight, screen size and price. You consider a number of different models, and narrow your list based on its speed and monitor screen size, then finally select a model to buy based on its weight and price. In this decision, speed and monitor screen size are examples of:
A) order winners.
B) a mission statement.
C) a needs assessment.
D) order qualifiers.
Answer: D
Difficulty: Easy
Keywords: order qualifier
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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9) Using an airline example for competitive priorities, the process capability of handling service needs of all market segments and promotional programs would be best described by:
A) top quality.
B) variety.
C) consistent quality.
D) delivery speed.
Answer: B
Difficulty: Easy
Keywords: variety, competitive priorities
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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10) A company's ability to quickly introduce a new service or product would be best described as:
A) volume flexibility.
B) variety.
C) consistent quality.
D) development speed.
Answer: D
Difficulty: Easy
Keywords: development speed, competitive priorities
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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11) A business focusing on increasing the efficiency of its operations is more directly addressing:
A) volume flexibility.
B) variety.
C) consistent quality.
D) low-cost.
Answer: D
Difficulty: Easy
Keywords: efficiency, low-cost, competitive priority
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12) While other suppliers bidding for the contract brought bids with lower per unit costs, Orchard wanted to take delivery based on the fact that the components they were using were machined to their exacting specifications 99.99999% of the time. Orchard's competitive priority was:
A) top quality.
B) consistent quality.
C) on-time delivery.
D) delivery speed.
Answer: B
Difficulty: Moderate
Keywords: competitive priority
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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13) A popular haberdashery could take a customer's measurements in the afternoon and produce a dandy suit ready for customer pickup by next morning. Their competitive priority was:
A) variety.
B) top quality.
C) delivery speed.
D) on-time delivery.
Answer: C
Difficulty: Moderate
Keywords: competitive priority
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14) For students not wanting a traditional major in marketing or accounting, for example, the college decided to create a general business major, which allowed any combination of the easiest business courses to comprise the program. The competitive priority achieved in this example is:
A) customization.
B) delivery speed.
C) consistent quality.
D) low-cost.
Answer: A
Difficulty: Easy
Keywords: customization, competitive priority
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15) A company's ability to support varying rates of production is *best* described as:
A) volume flexibility.
B) variety.
C) consistent quality.
D) development speed.
Answer: A
Difficulty: Moderate
Keywords: volume flexibility, competitive priorities
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

16) A company's ability to handle a wide variety of services and products efficiently is *best* described as:
A) volume flexibility.
B) variety flexibility.
C) customization.
D) development speed.
Answer: B
Difficulty: Moderate
Keywords: volume flexibility, competitive priorities
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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17) A firm gains competitive advantage by outperforming competitors in terms of competitive priorities, which fall into four major groups: _____, _____, _____, and _____.
Answer: cost, quality, time, flexibility
Difficulty: Moderate
Keywords: competitive priorities, cost, quality, time, flexibility
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

18) _____ is the elapsed time between receiving a customer's order and filling it.
Answer: Lead time
Difficulty: Easy
Keywords: time, delivery speed
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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19) _____ measures the frequency with which delivery-time promises are met.
Answer: On-time delivery
Difficulty: Moderate
Keywords: on-time delivery
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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20) _____ is the ability to satisfy the unique needs of each customer by changing service or product designs.
Answer: Customization
Difficulty: Moderate
Keywords: customization, flexibility
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
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21) Every sub-contractor knew that their quality had to be excellent to be considered for the project; it was their ability to deliver on time that would secure the lucrative contract. Quality was recognized as being a(n) _____, but on-time delivery was the _____.
Answer: order qualifier, order winner
Difficulty: Moderate
Keywords: order qualifier, order winner
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Reflective Thinking
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

22) The Minimal level required from a set of criteria for a firm to do business in a particular market segment is called a(n) _____.
Answer: order qualifier
Difficulty: Moderate
Keywords: order qualifier, order winner
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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23) Explain what an operations strategy is and the importance of competitive priorities. Give an example from an organization (public or private, manufacturing or service).
Answer: An operations strategy is the means by which operations implements the firm's corporate strategy. Competitive priorities are the key capabilities that operations must develop to compete successfully in a market segment. Possible competitive priorities include low-cost operation, high-performance design, consistent quality, delivery speed, on-time delivery, development speed, customization, and volume flexibility. Examples will vary.
Difficulty: Moderate
Keywords: operations strategy competitive priorities
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

24) Name the two competitive priorities for quality and give an example of each.
Answer: The two competitive priorities are top quality, which is the determination of the level of operations performance required in making a product or performing a service, and consistent quality, which measures the frequency with which the product or service meets design specifications. Examples will vary.
Difficulty: Moderate
Keywords: competitive priorities, top quality, consistent quality
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify nine competitive priorities used in operations strategy, and explain how a consistent pattern of decisions can develop organizational capabilities.

25) Name the three competitive priorities for time and give an example of each.
Answer: The three competitive priorities for time are delivery speed, on-time delivery, and development speed. Delivery speed refers to the elapsed time between receiving a customer's order and filling it. On-time delivery measures the frequency with which delivery-time promises are met. Development speed measures how quickly a new product or service is introduced. Examples will vary.
Difficulty: Moderate
Keywords: competitive priorities, delivery speed, on-time delivery, development speed
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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1.6 Trends and Challenges in Operations Management

1) Most products today are composites of global materials and services from throughout the world.
Answer: TRUE
Difficulty: Moderate
Keywords: globalization, products
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

2) The increased global presence of many firms has lessened the burden to behave ethically.
Answer: FALSE
Difficulty: Easy
Keywords: ethics, global presence
Learning Outcome: Discuss the influences of the global competitive environment on operations management
AACSB: Ethical Understanding and Reasoning
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

3) In an assembly operation at a furniture factory, ten employees assembled an average of 600 custom chairs per 5-day week. What is the labor productivity of this operation?
A) 12 chairs per worker per day
B) 20 chairs per worker per day
C) 15 chairs per worker per day
D) 25 chairs per worker per day
Answer: A
Difficulty: Moderate
Keywords: labor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

4) A manufacturing process requires 12 minutes of labor to make 10 units of product. Which of the following actions will increase productivity?
1. Increase labor per 10 units of production
2. Decrease labor per 10 units of production
3. Increase number of units per 10 minutes of labor
4. Decrease number of units per 12 minutes of labor
A) 1 and 3 only
B) 2 and 4 only
C) 1 and 4 only
D) 2 and 3 only
Answer: D
Difficulty: Easy
Keywords: labor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

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5) The details of weekly output and input for a fabrication process are as follows: output is 600 units, with a standard selling price of $50 per unit. For the week, total labor costs are: 8 workers at 40 hours for the week, are paid $20 per hour. Total material costs for the 400 units are $8,000. Weekly overhead is charged at the rate of 1.3 times the labor costs. What is the multifactor productivity for the week?
A) 0.54
B) 1.32
C) 1.84
D) 2.00
Answer: B
Difficulty: Moderate
Keywords: multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

Table 1.2
The Green Battery Company manufactures lithium ion batteries. The current process uses 15 workers and produces 50 units per hour. You are considering changing the process with new automated technologies that increase output to 75 units per hour, but will require only 10 workers. Particulars are as follows:

	CURRENT PROCESS	**NEW PROCESS**
OUTPUT (UNITS / HOUR)	50	75
NUMBER OF WORKERS	15	10
MATERIAL COST / HOUR	$1000	$1250

Workers are paid at a rate of $15 per hour, and overhead is charged at 150% (or 1.5 times) labor costs. Finished batteries sell for $200 / unit.

6) Use the information provided in Table 1.2. What is the multifactor productivity of the current process?
A) less than or equal to 6.0
B) greater than 6.0 but less than or equal to 9.0
C) greater than 9.0 but less than or equal to 12.0
D) greater than 12.0
Answer: B
Difficulty: Moderate
Keywords: multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

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7) Use the information provided in Table 1.2. What is the multifactor productivity of the new process?
A) less than or equal to 6.0
B) greater than 6.0 but less than or equal to 9.0
C) greater than 9.0 but less than or equal to 12.0
D) greater than 12.0
Answer: C
Difficulty: Moderate
Keywords: multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

8) Use the information provided in Table 1.2. Based on your productivity calculations, what decision should you make?
A) implement the new process
B) stay with the current process
C) need more information to make a decision
D) Either process is acceptable (since the multi-factor productivities are the same).
Answer: A
Difficulty: Moderate
Keywords: multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

9) It takes the Blacksburg shipyard twenty weeks with 200 workers to build an airplane. Material costs are $15 million and overhead costs are $1.5 million. Workers cost $35 per hour including benefits and work 40 hours per week. Each airplane sells for $50 million. What is the multifactor productivity ratio?
A) less than 1.0
B) greater than 1.0 but less than or equal to 2.0
C) greater than 2.0 but less than or equal to 3.0
D) greater than 3.0
Answer: C
Difficulty: Moderate
Keywords: multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

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10) Which of the following would be considered a disadvantage resulting from globalization of operations?
A) loss of proprietary technology in working with offshore suppliers
B) alienation of customers in foreign market of operation
C) high levels of worker skills in foreign countries
D) strong global competition and increased worldwide demand
Answer: A
Difficulty: Moderate
Keywords: global competition
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Diverse and Multicultural Work Environments
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

11) With regards to globalized operations and cost advantages, what China is to manufacturing, India is to:
A) services.
B) human resources.
C) finance.
D) supply chain.
Answer: A
Difficulty: Moderate
Keywords: global competition
Learning Outcome: Discuss the influences of the global competitive environment on operations management
AACSB: Application of Knowledge
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

12) Companies that do not have operations in China find it difficult to compete based on the basis of low prices with companies that do. Instead those companies tend to compete based on:
A) quality and social responsibility.
B) speed and small production runs.
C) luxury.
D) quality and small production runs.
Answer: B
Difficulty: Moderate
Keywords: global competition
Learning Outcome: Discuss the influences of the global competitive environment on operations management
AACSB: Application of Knowledge
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

13) Productivity is defined as _____ divided by _____.
Answer: output, input
Difficulty: Moderate
Keywords: output, input, productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

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14) Half of the world's greenhouse gases are produced by only seven nations including _____, _____ and _____.
Answer: China, United States, India (students can answer in any order)
Difficulty: Moderate
Keywords: environment, greenhouse gas
Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability
AACSB: Ethical Understanding and Reasoning
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

15) How has global competition affected productivity? Cite specific examples and reference the productivity equation to support your thesis.
Answer: Examples will vary; students should argue that the increase in global competition has increased productivity for those firms that have survived. Firms that fail (or have already failed) to effectively compete with new competition suffer from reduced sales, so the numerator in the productivity equation will be lower, perhaps without a commensurate decrease in the denominator, resulting in reduced productivity. Firms that are effectively competing against global competition probably have higher levels of productivity. Global operations might include cheaper or better raw materials and labor, resulting in a smaller denominator and higher productivity. Global competition might also inject new management techniques and leaner operations if some services are outsourced to specialist companies.
Difficulty: Moderate
Keywords: productivity, raw materials, labor
Learning Outcome: Discuss the influences of the global competitive environment on operations management
AACSB: Application of Knowledge
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

16) What are some disadvantages of globalization?
Answer: Operations in other countries can have disadvantages. A firm may have to relinquish proprietary technology if it turns over some of its component manufacturing to offshore suppliers or if suppliers need the firm's technology to achieve desired quality and cost goals. Political risks may also be involved. Each nation can exercise its sovereignty over the people and property within its borders. The extreme case is nationalization, in which a government may take over a firm's assets without paying compensation. Exxon and other large multinational oil firms are scaling back operations in Venezuela due to nationalization concerns. Further, a firm may actually alienate customers back home if jobs are lost to offshore operations. Employee skills may be lower in foreign countries, requiring additional training time. South Korean firms moved much of their sports shoe production to low-wage Indonesia and China, but they still manufacture hiking shoes and in-line roller skates in South Korea because of the greater skills required. In addition, when a firm's operations are scattered globally, customer response times can be longer. Coordinating components from a wide array of suppliers can be challenging.
Difficulty: Moderate
Keywords: globalization
Learning Outcome: Discuss the influences of the global competitive environment on operations management
AACSB: Application of Knowledge
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

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17) What are some ethical issues that are prevalent in organizations that have a global operations presence?
Answer: Some countries are more sensitive than others about conflicts of interest, bribery, discrimination against minorities and women, minimum-wage levels, and unsafe workplaces. Managers must decide whether to design and operate processes that do more than just meet local standards. In addition, technological change brings debates about data protection and customer privacy. In an electronic world, businesses are geographically far from their customers, so a reputation of trust is paramount.
Difficulty: Moderate
Keywords: ethical issues, ethics, globalization
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Ethical Understanding and Reasoning
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

18) Barry's Tire Service completed 100 tire changes, six brake jobs, and 16 alignments in an eight-hour day with his standard crew of six mechanics. A brake specialist costs $16 per hour, a tire changer costs $8 per hour, and an alignment mechanic costs $14 per hour. The materials cost for a day was $2,000, and overhead cost was $500.
a. What is the shop's labor productivity if the retail price for each respective service is $60, $150, and $40?
b. What is the multifactor productivity, if the crew consisted of two of each type mechanic?
Answer:
a. $\frac{(100 \times 60 + 6 \times 150 + 16 \times 40)}{6 \times 8} = \$157/\text{hr}$

b. $\frac{\{(100 \times 60) + (6 \times 150) + (16 \times 40)\}}{\{(2 \times 8 \times 16) + (2 \times 8 \times 8) + (2 \times 8 \times 14) + 2{,}000 + 500\}} = 2.43$

Difficulty: Moderate
Keywords: labor productivity, multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

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Table 1.3
The Abco Company manufactures electrical assemblies. The current process uses 10 workers and produces 200 units per hour. You are considering changing the process with new assembly methods that increase output to 300 units per hour, but will require 14 workers. Particulars are as follows:

	CURRENT PROCESS	NEW PROCESS
OUTPUT (UNITS / HOUR)	200	300
NUMBER OF WORKERS	10	14
MATERIAL COST / HOUR	$120	$150

19) Use the information in Table 1.3. Workers are paid at a rate of $10 per hour, and overhead is charged at 140% (or 1.4 times) labor costs. Finished switches sell for $20/unit.

a. Calculate the multifactor productivity for the current process.
b. Calculate the multifactor productivity for the new process.
c. Determine if the new process should be implemented.
Answer:

a. $$\frac{(200)(\$20)}{(10)(\$10) + \$120 + (1.4)(10)(\$10)} = \frac{\$4{,}000}{\$360} = \underline{11.11}$$

b. $$\frac{(300)(\$20)}{(14)(\$10) + \$150 + (1.4)(14)(\$10)} = \frac{\$6{,}000}{\$486} = \underline{12.35}$$

c. The new process increases multifactor productivity and should be implemented.
Difficulty: Moderate
Keywords: labor productivity, multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
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20) The three-person crew worked their way through the neighborhood, mowing lawns, edging, applying fertilizer and weed treatments where necessary and collecting all the clippings for use as mulch as part of their new green initiative. Their pricing scheme appears in Table 1.4 and the mix of orders and service costs appear in Table 1.5:

a. What is their multifactor productivity for these orders in the prestigious Edmond Oaks neighborhood?
b. Which of the service combinations provided by them is the most productive service combination from a multifactor perspective?
c. What is their labor productivity for the same mix of orders?

Table 1.4: Price List

SERVICE	PRICE	LABOR	MATERIAL
Mow lawn	$75	1 hr	$2
Edge	$20	.25	$1
Fertilizer treatment	$120	.25	$45
Weed prevention treatment	$80	.25	$25
Multiple services	5% discount times the number of services		

Workers are paid at a rate of $10 per hour, and overhead is charged at 120% (or 1.2 times) labor costs. For a customer that gets both mowing and edging, their $95 bill would be discounted for two services times 5% for a total of 10% off the $95 straight charge for a cost of $85.50. A customer receiving three services would get a 15% discount off their service bill. Labor hours shown in Table 1.4 are total hours for the three-person crew.

Table 1.5 Orders Processed

SERVICE	# Customers
Mow lawn & edge	6
Mow lawn, edge, and fertilize	3
Mow lawn, edge, and weed prevention treatment	2
Mow lawn & fertilize	2

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Answer:
a. Multifactor Productivity Overall

Total Revenue = $86 × 6 + $182.75 × 3 + $148.75 × 2 + $175.50 × 2 = $1,709.75
Labor Cost = $12.50 × 6 + $15 × 3 + $15 × 2 + $12.50 × 2 = $175
Material Cost = $3 × 6 + $48 × 3 + $28 × 2 + $47 × 2 = $312
Overhead Cost = 1.2 × ($12.50 × 6 + $15 × 3 + $15 × 2 + $12.50 × 2) = $210

$$\text{Multifactor Productivity} = \frac{\$1{,}709.75}{\$175 + \$312 + \$210}$$

Multifactor Productivity = 2.45

b. Multifactor Productivity by Service

$$\textit{Mow \& Edge} = \frac{0.9 \times (\$75 + \$20)}{(1.25 \times \$10) + (\$2 + \$1) + 1.2 \times (1.25 \times \$10)} = 2.8$$

$$\textit{Mow \& Edge \& Fertilize} = \frac{0.85 \times (\$75 + \$20 + \$120)}{(1.5 \times \$10) + (\$2 + \$1 + \$45) + 1.2 \times (1.5 \times \$10)} = 2.26$$

$$\textit{Mow \& Edge \& Weed} = \frac{0.85 \times (\$75 + \$20 + \$80)}{(1.5 \times \$10) + (\$2 + \$1 + \$25) + 1.2 \times (1.5 \times \$10)} = 2.44$$

$$\textit{Mow \& Fertilize} = \frac{0.9 \times (\$75 + \$120)}{(1.25 \times \$10) + (\$2 + \$45) + 1.2 \times (1.25 \times \$10)} = 2.36$$

The package with the highest multifactor productivity is the Mow & Edge

c. Overall Labor Productivity.

Total Revenue = $85.59 × 6 + $182.75 × 3 + $148.75 × 2 + $175.50 × 2 = $1,709.75
Labor Cost = $12.50 × 6 + $15 × 3 + $15 × 2 + $12.50 × 2 = $175

$$\text{Labor Productivity} = \frac{\$1{,}709.75}{\$175}$$

Labor Productivity = 9.77
Difficulty: Challenging
Keywords: labor productivity, multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Analytical Thinking
Learning Objective: Identify the latest trends in operations management and understand how firms can address the challenges facing operations and supply chain managers in a firm.

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21) The three-person crew worked their way through the neighborhood, testing doorknobs and windows and slipping past security systems like a team of ninjas. Of course, they weren't ninjas, but a crew of brazen burglars, hoping to grab cash and other valuables to fence at the next level of their supply chain. Fortune smiles on them on this day in the prestigious Edmond Oaks neighborhood. A lawn maintenance crew is creating a tremendous racket mowing and edging lawns, which completely drowns out the sounds of breaking glass. Details of the day's haul appear in Table 1.6.
a. What is the multifactor productivity?
b. What is the labor productivity?

Table 1.6: The Haul

ITEM	SALES PRICE	LABOR	MATERIAL
Krugerrand	$1,500	1 hr	$2
Flat screen TV	$250	.25	$1
$200 cash	$200	.05	$45
Lava lamp	$5	.15	$25
Rolex watch	$180	.10	$1

Workers are paid at a flat rate of 20% of the sales price of the merchandise. Materials cost represents the cost of gasoline and surgical gloves, and overhead is 20% of the sales price of the merchandise.
Answer:
a. Multifactor Productivity

Total Revenue = $1,500 + $250 + $200 + $5 + $180 = $2,135
Labor Cost = 20% × ($1,500 + $250 + $200 + $5 + $180) = $427
Material Cost = $2 + $1 + $45 + $25 + $1 = $74
Overhead Cost = 20% × ($1,500 + $250 + $200 + $5 + $180) = $427
Multifactor Productivity = $\frac{\$2,135}{\$427 + \$74 + \$247}$

Multifactor Productivity = 2.30

b. Labor Productivity

Total Revenue = $1,500 + $250 + $200 + $5 + $180 = $2,135
Labor Cost = 20% × ($1,500 + $250 + $200 + $5 + $180) = $427
Labor Productivity = $\frac{\$2,135}{\$427}$

Labor Productivity = 5
Difficulty: Moderate
Keywords: labor productivity, multifactor productivity
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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1.7 Fourth Industrial Revolution (Industry 4.0)

1) The fourth industrial revolution that ushered in the digital age, introduced the use of computers in the production process.
Answer: FALSE
Difficulty: Moderate
Keywords: industry 4.0, technology
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

2) The Internet of Things is a trend that affects operations and supply chain management in a minor way.
Answer: FALSE
Difficulty: Easy
Keywords: technology, challenges, internet
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

3) Artificial Intelligence is a constellation of technologies that allows machines to sense, comprehend, act, and learn.
Answer: TRUE
Difficulty: Easy
Keywords: technology, artificial intelligence
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

4) Which of the following statements about "big data" is false?
A) The data must be organized and analyzed to be of any use.
B) Firms use high-powered analytical models to sift through the data
C) Data may be collected instantly or over a period of months.
D) It is not necessary for operations managers to be involved in implementation of "big data" processes.
Answer: D
Difficulty: Moderate
Keywords: technology, internet, data
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

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5) The question of whether a manufacturer has rights to utilize data collected from a health monitoring device to improve future versions of the product is a concern of:
A) privacy.
B) technology.
C) security.
D) hardware costs.
Answer: A
Difficulty: Moderate
Keywords: technology, internet, data
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

6) The utilization of sensor data to detect deteriorating machine parts prior to product failure is an example of which operations management application?
A) product design and development
B) inventory management
C) preventive maintenance
D) logistics
Answer: C
Difficulty: Moderate
Keywords: technology, internet, data
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

7) Computer systems used in manufacturing to track and document the transformation of raw materials into finished goods are known as:
A) manufacturing execution systems.
B) distributed production networks.
C) additive manufacturing systems.
D) grid technology networks.
Answer: A
Difficulty: Moderate
Keywords: industry 4.0, technology
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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8) Interconnected objects such as sensors that can automate the collection and exchange of data over a network are known as:
A) grid technology networks.
B) internet of things.
C) computer aided manufacturing systems.
D) distributed production networks.
Answer: A
Difficulty: Easy
Keywords: industry 4.0, technology
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

9) The use of sensors that can be used to monitor how products are performing in the field and the use of digital remote interfaces that can be used to connect those products to their manufacturer is an example of which type of smart technology?
A) smart customer technology
B) smart product technology
C) smart supply technology
D) smart intranet technology
Answer: B
Difficulty: Easy
Keywords: industry 4.0, smart technology
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

10) What type of barrier is the bandwidth that will be needed to support the interconnectivity of billions of devices under a smart technology model?
A) privacy
B) technology
C) security
D) organizational
Answer: B
Difficulty: Moderate
Keywords: technology, IoT
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

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11) Which of the following is *not* an implication of additive manufacturing for operations and supply chain management?
A) increased material inputs
B) simplified production
C) production flexibility
D) decentralized production networks
Answer: A
Difficulty: Moderate
Keywords: additive manufacturing, 3D printing
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

12) Which is currently the greatest challenge in using additive manufacturing to produce more sophisticated, high valued parts?
A) intellectual property rights
B) quality assurance
C) modification of processes
D) workforce skills
Answer: B
Difficulty: Moderate
Keywords: additive manufacturing, 3D printing
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

13) In order to utilize the capabilities of the internet of things, the organizational roles of _____ and _____ will have to become more aligned, although they are traditionally two separate functional areas.
Answer: operations management, information technology
Difficulty: Challenging
Keywords: internet, technology
Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

14) The technologies that build three-dimensional (3D) objects by adding layers of material such as plastic, metal, or concrete is known as _____.
Answer: additive manufacturing
Difficulty: Moderate
Keywords: additive manufacturing, 3D printing
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

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15) What are some of the concerns operations managers must address regarding using the internet of things? Cite a specific example.
Answer: Examples will vary, but students will mention concerns with technology, privacy, security, or organizational roles. They may also discuss the challenges of implementing the hardware, gathering the "big data", analysis of the data, and use of the data to aid in decision-making processes.
Difficulty: Moderate
Keywords: technology, internet, challenges
Learning Outcome: Discuss the influences of the global competitive environment on operations management
AACSB: Application of Knowledge
Learning Objective: Define the fourth industrial revolution (Industry 4.0) and understand how its embedded technologies and automation are transforming the practice of operations and supply chain management.

1.8 Developing Skills for Your Career

1) Understanding the concepts in this text will help you become an effective manager in any functional area of business.
Answer: TRUE
Difficulty: Easy
Keywords: process design, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Understand how to develop skills for your career using this textbook.

2) Managing supply chains does not involve processes external to the firm.
Answer: FALSE
Difficulty: Easy
Keywords: process design, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Understand how to develop skills for your career using this textbook.

3) The effective operation of a firm and its supply chain is more important than the design and implementation of its processes.
Answer: FALSE
Difficulty: Moderate
Keywords: process design, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Understand how to develop skills for your career using this textbook.

4) It is the sole responsibility of the operations function of an organization to design and operate processes that are part of a supply chain.
Answer: FALSE
Difficulty: Moderate
Keywords: process design, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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5) The topics of forecasting, inventory management and resource planning is associated with which part of supply chain and operations management?
A) process strategy and analysis
B) managing customer demand
C) designing logistics networks
D) statistical process control
Answer: B
Difficulty: Moderate
Keywords: customer demand, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Understand how to develop skills for your career using this textbook.

6) Operations managers are involved at both the strategic and tactical levels of corporate strategy.
Answer: TRUE
Difficulty: Easy
Keywords: strategic level, tactical level
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Understand how to develop skills for your career using this textbook.

7) If a retail store owner does not have a popular item in stock because he underestimated the forecasted sales for that item, he most likely has a challenge with:
A) managing processes.
B) managing customer demand.
C) managing supply chains.
D) managing people.
Answer: B
Difficulty: Moderate
Keywords: process design, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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Learning Objective: Understand how to develop skills for your career using this textbook.

8) The key decisions to eliminate activities that do not add value while improving those that do are an important part of:
A) managing processes.
B) managing customer demand.
C) managing supply chains.
D) managing people.
Answer: A
Difficulty: Moderate
Keywords: process design, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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9) _____ are often responsible for key performance measures such as cost and quality.
Answer: Operations Managers
Difficulty: Moderate
Keywords: process innovation, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Understand how to develop skills for your career using this textbook.

10) Each function of an organization is connected with operations through shared _____.
Answer: processes
Difficulty: Moderate
Keywords: process innovation, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
AACSB: Application of Knowledge
Learning Objective: Understand how to develop skills for your career using this textbook.

11) Effective management of its processes can allow a firm to reduce its _____ and also increase _____.
Answer: costs, customer satisfaction
Difficulty: Moderate
Keywords: process innovation, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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12) Explain the types of decisions that operations managers are involved in and how they are linked to a firm's strategy.
Answer: Operations managers are involved in tactical decisions such as process improvement, performance measurement, the management and planning of projects, staffing management, inventory management, and resource scheduling. Operations manager's decisions should reflect corporate strategy. These decisions have strategic impact because they allow the firm to gain a competitive advantage.
Difficulty: Moderate
Keywords: strategy, innovation, supply chains
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization
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