

CHAPTER 1

OPERATIONS MANAGEMENT

CHAPTER LEARNING OBJECTIVES

1. *Describe what the operations function is and how it relates to other business functions.*

Operations can be viewed as a transformation process that converts inputs into outputs of greater value. Operations management is the study of processes directly related to the creation and distribution of goods and services. Increasingly, these operations are taking place outside of the boundaries of a traditional enterprise. Thus, while today's managers need to understand how to efficiently manage operations within their own firm, they also need to develop skills in coordinating operations across a global supply chain. This text teaches students how to analyze processes, ensure quality, create value, and manage the flow of information, products, and services across a network of customers, enterprises, and supply chain partners. Operations is the technical core or "hub" of the organization, interacting with the other functional areas and suppliers to produce goods and provide services for customers.

2. *Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.* Operations management did not really begin until the Industrial Revolution. Before then, products were made by skilled craftpersons and their apprentices, one at a time. With the rise of factories, though, came an increased division of labour, where workers were only responsible for one small part of the total production process. For many years, factories were dominated by the concept of mass production, but this eventually gave way to the realization that production should be tied to customer demands (the quality revolution). The field of supply chain management was born to manage the flow of information, products, and services across a network of customers, enterprises, and supply chain partners.

3. *Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.* Two-thirds of today's businesses operate globally through global markets, global operations, global financing, and global supply chains. Many companies are now outsourcing much of their production and service functions to other countries. China accounts for 20% of the world's population and is the world's largest manufacturer. India, on the other hand, is known as the world's service provider. India has an enormous resource of highly skilled engineers, scientists, and technically trained workers available at less than half the cost of those located in developed countries.

4. *Calculate and interpret productivity measures used for measuring competitiveness.* Competitiveness has been defined by the OECD as "the degree to which a nation can produce goods and services that meet the test of international markets while simultaneously maintaining or expanding the real incomes of its citizens." The most common measure of competitiveness is productivity, which is the ratio of input to output.

5. Discuss the process of developing, deploying, and monitoring the success of an operations strategy. Firms choose to compete in different ways. A firm's *strategy* defines how it will compete in the marketplace—its own best way. Strategy formulation involves defining the primary task, assessing core competencies, determining order winners and order qualifiers, and positioning the firm. An effective strategy meets the order qualifiers and excels on the order winners. A competitive position is not sustainable unless the operating system that supports it is configured and managed effectively.

Policy deployment is a planning system that helps align day-to-day operating decisions with the company's overall strategy. The *balanced scorecard* reinforces a firm's strategy by providing customer-oriented and process-oriented measures of performance, in addition to traditional financial measures.

Decision making for the future can be scary at best. Fortunately, there are quantitative tools available for making decisions under uncertain conditions. The supplement to this chapter reviews several of them.

TRUE-FALSE STATEMENTS

1. Operations management is concerned only with the day-to-day operations of a firm's productive systems.

Answer: False

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

2. A warehouse operation is an example of a physical transformation process.

Answer: False

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

3. A retail operation is an example of an exchange transformation process.

Answer: True

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

4. Operations management designs, operates, and improves productive systems.

Answer: True

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

5. The four primary functional areas of a firm are marketing, finance, operations, and human resources.

Answer: True

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

6. A transformation process is a series of activities from supplier to customer that add value to a product or service.

Answer: False

Difficulty: Medium

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Comprehension

AACSB: Reflective Thinking

7. Human resources management provides demand estimates that are used in production decisions.

Answer: False

Difficulty: Medium

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Comprehension

AACSB: Reflective Thinking

8. To be effective an operations manager needs an integrated view of business organizations.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Knowledge

AACSB: Reflective Thinking

9. The systematic analysis of work methods is known as scientific management.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Knowledge

AACSB: Reflective Thinking

10. Operations research is concerned with the systematic analysis of work methods.

Answer: False

Difficulty: Medium

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Comprehension

AACSB: Reflective Thinking

11. Mass production refers to high-volume production of a standardized product.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Knowledge

AACSB: Reflective Thinking

12. The adaptation of mass production to emphasize efficiency, rather than quality is known as lean production.

Answer: False

Difficulty: Medium

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Comprehension

AACSB: Reflective Thinking

13. The set of activities that create and deliver products to the customer is known as the supply chain.

Answer: True

Difficulty: Medium

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Knowledge

AACSB: Reflective Thinking

14. The process of producing high-volume, standardized products for a large market is known as craft production.

Answer: False

Difficulty: Medium

Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Comprehension

AACSB: Reflective Thinking

15. The European Union requires that strict quality and environmental standards be met before companies can do business with member countries.

Answer: True

Difficulty: Medium

Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Knowledge

AACSB: Reflective Thinking

16. Globalization has affected both manufacturing and service operations.

Answer: True

Difficulty: Easy

Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Knowledge

AACSB: Reflective Thinking

17. Two-thirds of today's businesses operate globally.

Answer: True

Difficulty: Medium

Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Knowledge

AACSB: Reflective Thinking

18. China is reshaping the way firms compete globally.

Answer: True

Difficulty: Easy

Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Knowledge

AACSB: Reflective Thinking

19. Globalization requires that firms compete on cost and *not* quality, speed, or flexibility.

Answer: False

Difficulty: Medium

Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Knowledge

AACSB: Reflective Thinking

20. Globalization of the supply chain for many products has many pros and few, if any, cons.

Answer: False

Difficulty: Medium

Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Comprehension

AACSB: Reflective Thinking

21. A major challenge and opportunity for many firms is the globalization of the supply chain.

Answer: True

Difficulty: Easy

Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Knowledge

AACSB: Reflective Thinking

22. Productivity increases enable a nation to raise its standard of living.

Answer: True

Difficulty: Easy

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Knowledge

AACSB: Reflective Thinking

23. A nation's productivity is unrelated to its standard of living.

Answer: False

Difficulty: Easy

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Knowledge

AACSB: Reflective Thinking

24. Productivity is the most common measure of competitiveness.

Answer: True

Difficulty: Easy

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Knowledge

AACSB: Reflective Thinking

25. Single factor productivity compares output to an individual input.

Answer: True

Difficulty: Medium

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Knowledge

AACSB: Reflective Thinking

26. Canadian companies can become globally competitive by emphasizing the strategic importance of operations.

Answer: True

Difficulty: Medium

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Comprehension

AACSB: Reflective Thinking

27. Many companies now find it necessary to have some global presence to remain competitive.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

28. Ensuring good quality underlies all operational decisions.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

29. Emphasizing the strategic role of operations enhances the competitiveness of Canadian companies.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

30. Deployment is a step in strategy formulation that evaluates the alignment between core competencies and order winners.

Answer: False

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

31. Positioning is a step in strategy formulation that compares core competencies and order winners.

Answer: True

Difficulty: Medium

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Comprehension

AACSB: Reflective Thinking

32. Order qualifiers are the characteristics of a product that have to be satisfied just to be considered for purchase by a customer.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

33. An order qualifier is a customer criterion that wins the order.

Answer: False

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

34. Core competencies tend to be processes and *not* products or technologies.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

35. Strategy formulation starts with determining a firm's order winners and order qualifiers.

Answer: False

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

36. Order winners and order qualifiers change over time in response to the dynamics of changing market conditions.

Answer: True

Difficulty: Medium

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Comprehension

AACSB: Reflective Thinking

37. To be competitive firms must create and sustain core competencies that are in tune with their customer's order winners.

Answer: True

Difficulty: Medium

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Comprehension

AACSB: Reflective Thinking

38. Firms compete in the marketplace based on cost, speed, quality, and flexibility.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

MULTIPLE CHOICE QUESTIONS

39. Operations management is concerned with
- a) the design of a firm's productive systems.
 - b) the operation of a firm's productive systems.
 - c) the improvement of a firm's productive systems.
 - d) all of the above.

Answer: d

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

40. The transformation process associated with health care is best described as
- a) locational.
 - b) exchange.
 - c) physiological.
 - d) informational.

Answer: c

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

41. Which of the following is *not* one of the four primary functional areas of a firm?
- a) human resources
 - b) legal
 - c) marketing
 - d) operations

Answer: b

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

42. All of the following are responsibilities of operations managers *except*

- a) acquiring financial resources.
- b) managing inventories.
- c) planning production.
- d) scheduling production.

Answer: a

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

43. Transformation processes are all of the following *except*

- a) physiological.
- b) locational.
- c) exchange.
- d) optimal.

Answer: d

Difficulty: Easy

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

44. Linear programming, simulation, and waiting line theory are most closely associated with which era in the historical development of operations management?

- a) human relations
- b) operations research
- c) globalization
- d) Internet revolution

Answer: b

Difficulty: Medium

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

N1. Operations provides marketing with information on all except

- a) product or service availability.
- b) personnel needs.
- c) lead-time estimates.
- d) order status.

Answer: b

Difficulty: Medium

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Blooms: Knowledge

AACSB: Reflective Thinking

45. Which of the following is *not* an event or concept associated with the quality revolution?

- a) TQM (total quality management)
- b) PERT/CPM
- c) Business process reengineering
- d) JIT

Answer: b

Difficulty: Medium

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Comprehension

AACSB: Reflective Thinking

46. The work of W. Edwards Deming is most closely associated with

- a) MRP.
- b) TQM.
- c) supply chain management.
- d) time and motion studies.

Answer: b

Difficulty: Easy

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Knowledge

AACSB: Reflective Thinking

47. Linear programming, waiting line, simulation, and PERT/CPM are all parts of which era of operations management?

- a) Quality Research

- b) Operations Research
- c) Internet Revolution
- d) Globalization

Answer: b

Difficulty: Medium

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Comprehension

AACSB: Reflective Thinking

48. What are key elements of the division of labour?

- a) The production process is broken down into a series of small tasks.
- b) Small tasks are performed by different workers.
- c) The specialization of the workers on limited, repetitive tasks allows them to become very proficient at those tasks.
- d) All of the above.

Answer: d

Difficulty: Easy

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Blooms: Knowledge

AACSB: Reflective Thinking

49. The major factors impacting globalization of the supply chain include all the following *except*

- a) creation of the WTO.
- b) Regional Trade Agreements.
- c) fall of communism.
- d) advances in information and transportation technology.

Answer: c

Difficulty: Hard

Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Comprehension

AACSB: Reflective Thinking

50. Companies go global to

- a) take advantage of favourable costs.
- b) to keep abreast of trends and access new technologies.
- c) to build reliable sources of supply.

d) all the above.

Answer: d

Difficulty: Medium

Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Comprehension

AACSB: Reflective Thinking

51. A manager of a global supply chain is concerned with all the following *except*

- a) timeliness.
- b) quality.
- c) social issues.
- d) All the above are concerns.

Answer: d

Difficulty: Medium

Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.

Section Reference: 1.3 Globalization

Blooms: Comprehension

AACSB: Reflective Thinking

52. The production system that prizes flexibility over efficiency and quality over quantity is known as

- a) mass production.
- b) craft production.
- c) lean production.
- d) electronic commerce.

Answer: c

Difficulty: Medium

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Comprehension

AACSB: Reflective Thinking

53. Dividing a job into a series of small tasks each performed by a different worker is known as

- a) craft production.
- b) scientific management.
- c) division of labour.
- d) interchangeable parts.

Answer: c

Difficulty: Medium

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Comprehension

AACSB: Reflective Thinking

54. The ratio of a firm's monthly output to the number of labour hours used in the same month would be a measure of

- a) labour productivity.
- b) capital productivity.
- c) machine productivity.
- d) multifactor productivity.

Answer: a

Difficulty: Medium

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Knowledge

AACSB: Reflective Thinking

55. The degree of competitiveness in an industry can affect

- a) product innovation.
- b) technological investment.
- c) operating strategy.
- d) all of the above.

Answer: d

Difficulty: Easy

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Knowledge

AACSB: Reflective Thinking

56. Productivity can be increased by

- a) increasing outputs.
- b) decreasing labour input.
- c) decreasing energy input.
- d) All of the above.

Answer: d

Difficulty: Easy

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Blooms: Knowledge

AACSB: Reflective Thinking

57. A firm who is adept at recognizing global windows of opportunity, acting on those very quickly, with tight linkages can be said to be competing on

- a) flexibility.
- b) speed.
- c) quality.
- d) cost.

Answer: b

Difficulty: Hard

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Comprehension

AACSB: Reflective Thinking

58. When purchasing a car, what might be order winners?

- a) Price.
- b) Quality.
- c) Design.
- d) All of the above.

Answer: e

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.

Section Reference: 1.5 Strategy and Operations

Blooms: Knowledge

AACSB: Reflective Thinking

SHORT-ANSWER ESSAY QUESTIONS

59. Briefly describe how operations can be viewed as a transformation process.

Answer:

Difficulty: Easy

Section Reference 1: 1.0 Introduction

Solution: Operations is often defined as a transformation process. Inputs such as raw materials, labour, equipment, and capital are transformed into outputs (goods and services). Customer feedback is used to adjust the transformation process. An objective of the operations manager is to ensure that the transformation process operates efficiently, and the outputs of the process have greater value than the sum of the inputs. In this way the transformation process creates value, making it possible to view the transformation process as a value chain extending from supplier to customer.

Blooms: Comprehension

AACSB: Reflective Thinking

60. Briefly describe the four primary functional areas of a firm. How is operations related to them?

Answer:

Difficulty: Medium

Learning Objective: Describe what the operations function is and how it relates to other business functions.

Section Reference: 1.1 The Operations Function

Solution: The four primary functional areas of a firm are marketing, finance, operations, and human resources. For most firms, operations is the technical core or “hub” of the organization, interacting with the other functional areas and suppliers to produce goods and services for customers. For example, marketing provides sales forecasts to operations and operations provides marketing with product availability information, lead time estimates, and delivery schedules. Operations provides finance with inventory and production data, capital budgeting and equipment requests, and technology plans. Finance provides the capital resources for financing inventory and securing more capital equipment. Operations relies on human resources to meet its personnel needs—hiring, training, and evaluating workers.

Blooms: Comprehension

AACSB: Reflective Thinking

61. What is electronic commerce?

Answer:

Difficulty: Medium

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Solution: Trade that occurs over the Internet (or any other computer network) is called electronic commerce, e-commerce, or e-business. Electronic commerce can take the form of trade between businesses (B2B), between consumers, or between business and consumers (B2C). B2B trade typically involves companies and their suppliers while B2C trade can take the form of online retailing. Companies that integrate both B2B and B2C are said to have a fully integrated value chain.

Blooms: Comprehension

AACSB: Reflective Thinking

62. What are interchangeable parts and their advantages?

Answer:

Difficulty: Medium

Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.

Section Reference: 1.2 The Evolution of Operations and Supply Chain Management

Interchangeable parts are those which can be used in more than one product. The introduction of interchangeable parts by Eli Whitney (1790s) allowed the manufacture of firearms, clocks, watches, sewing machines, and other goods to shift from customized one-at-a-time production to volume production of standardized parts. This meant the factory needed a system of measurements and inspection, a standard method of production, and supervisors to check the quality of the worker's production.

Blooms: Comprehension

AACSB: Reflective Thinking

63. What is productivity and how is it measured?

Answer:

Difficulty: Easy

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Solution: Productivity is the ratio of output to input. Output can be expressed in units or dollars.

Single factor productivity compares output to individual inputs, such as labour hours, investment in equipment, or material usage. Multifactor productivity relates output to a combination of inputs, such as labour + capital. Total factor productivity compares the quantity of goods and services produced with all the inputs used to produce them.

Blooms: Comprehension

AACSB: Reflective Thinking

64. What can lead to increases in productivity?

Answer:

Difficulty: Medium

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Solution: Productivity increases when firms become more efficient, expand, achieve breakthroughs that enable output increases to occur with reduced inputs, downsize while maintaining output with fewer inputs, and retrench with output and inputs decreasing but inputs decreasing at a faster rate than output.

Blooms: Comprehension

AACSB: Reflective Thinking

65. What are some important considerations to make when using the productivity measure?

Answer:

Difficulty: Medium

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.

Section Reference: 1.4 Productivity and Competitiveness

Solution:

There are many ways in which productivity statistics can be misleading. Examining the formula for productivity, output/input, it becomes apparent that productivity can be increased in different ways. For example, a country or firm may increase productivity by decreasing input faster than output. Thus, although the company may be retrenching, its productivity is increasing. Seldom is this avenue for increasing productivity sustainable (see Example 1.1).

Productivity statistics also assume that if more input were available, output would increase at the same rate. This may not be true, as there may be limits to output other than those on which the productivity calculations are based. Furthermore, productivity emphasizes output produced, not output sold. If products produced are not sold, inventories pile up and increases in output can actually accelerate a company's decline. Finally, productivity is a relative measure, which is why statistics provided in government reports typically measure percentage changes in productivity from month to month, quarter to quarter, year to year, or over a number of years.

AACSB: Reflective Thinking

Blooms: Comprehension

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