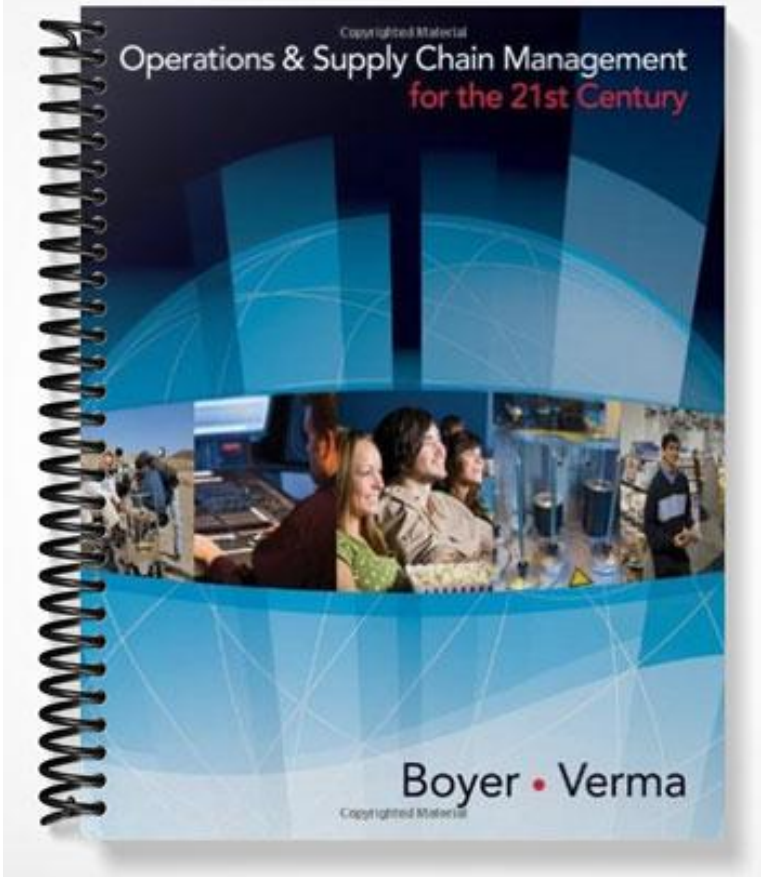
TEST BANK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Chapter 2: Quality Management

TRUE/FALSE

1. High quality implies having the capability to consistently produce products that satisfy or exceed customer needs.

   ANS: T
   Page 30

   PTS: 1

2. In 1979, Dr. W. Edwards Deming authored the book *Quality Is Free*, which emphasized that doing things right the first time adds nothing to the cost of a product or service.

   ANS: F
   Page 30.

   PTS: 1

3. External failure costs refer to the cost of poor quality if the error is caught within the production facility before it is sold to the customer.

   ANS: F
   Page 30

   PTS: 1

4. High-quality products and services are necessary for the survival, growth, and competitiveness of an organization.

   ANS: T
   Page 31

   PTS: 1

5. As quality increases, both internal and external failure costs decrease, whereas assurance and prevention costs increase.

   ANS: T
   Page 31

   PTS: 1

6. Research over a long period has shown that it is more costly to continue serving existing customers than to increase market share.

ANS: F
Page 32

PTS: 1

7. Determining the underlying components of quality is rather straightforward because quality normally means the same thing to different customers.

ANS: F
Page 33

PTS: 1

8. Like the quality of tangible goods, the quality of a service is also determined by multiple dimensions.

ANS: T
Page 33

PTS: 1

9. Perception does not influence a customer's opinion of product quality.

ANS: F
Page 33

PTS: 1

10. Craftsmen were generally in direct contact with their customers, and products were created on the basis of specifications provided by individual customers to local producers.

ANS: T
Page 36

PTS: 1

11. Inspection is the selection of randomly selected products from the production line for quality checks.

ANS: F
Page 36

PTS: 1

12. The Deming Prize is the highest honor for quality and performance excellence for a United States-based manufacturing, service, small business, education, or healthcare organization.

ANS: F
Page 36

PTS: 1

13. Feigenbaum, known as the father of modern quality management, used 14 points and the Plan-Do-Check-Act cycle to provide guidelines for implementing quality improvement plans.

    ANS: F
    Page 38

    PTS: 1

14. A quality circle is a small group of employees who are responsible for similar or related work functions, and meets regularly to identify, analyze, and solve quality and production problems related to its work.

    ANS: T
    Page 39

    PTS: 1

15. Robust quality principles are now routinely used in identifying the optimum design of product components for many complex industries.

    ANS: T
    Page 40

    PTS: 1

16. TQM advocates support and commitment from the highest level of management.

    ANS: T
    Page 41

    PTS: 1

17. The primary objective of ISO standards is to make the development, manufacturing, and supply of products and services more efficient, safe, and clean.

    ANS: T
    Page 42

    PTS: 1

18. The U.S. government mandates ISO 9000 standards.

    ANS: F
    Page 42

    PTS: 1

19. Total quality management (TQM) is an umbrella term that is used to describe a quality management system that addresses all areas and employees of an organization, emphasizes customer satisfaction, and uses continuous improvement tools and techniques.

    ANS: T
    Page 40

    PTS: 1

20. The focus of ISO 14000 standards is on minimizing the harmful effects on the environment caused by an organization's activities and on achieving continual improvement in environmental performance.

    ANS: T
    Page 44

    PTS: 1

21. The guiding framework of MBNQA is not an adequate model for implementing TQM and the teachings of quality gurus.

    ANS: F
    Page 45

    PTS: 1

22. Visionary leadership is a central tenet of the MBNQA.

    ANS: T
    Page 47

    PTS: 1

23. The focus of ISO 9000 standards is on minimizing the harmful effects on the environment caused by an organization's activities and on achieving continual improvement in environmental performance.

    ANS: F
    Page 44

    PTS: 1

24. **DMAIC**, which stands for **D**efine, **M**easure, **A**nalyze, **I**mprove, and **C**ontrol, is central to Six Sigma.

    ANS: T
    Page 49

    PTS: 1

25. Six Sigma has a genuine focus on understanding the needs and preferences of the customer.

    ANS: T
    Page 49

    PTS: 1

26. A Six Sigma quality thus means that the distance from the mean value of the process to both the LTL and the UTL is six standard deviations.

    ANS: T
    Page 51

    PTS: 1

27. The first three steps in the DMAIC plan are called the process characterization phase because they provide descriptive information about the existing process.

    ANS: T
    Page 56

    PTS: 1

28. Six Sigma emphasizes the need to react to quality problems as soon as possible after they occur.

    ANS: F
    Page 56

    PTS: 1

29. Meeting a customer's minimum standards is sufficient for a successful Six Sigma Program.

    ANS: F
    Page 57

    PTS: 1

30. Having a customer focus is central to ISO 9000 standards, the Baldrige framework, and Six Sigma.

    ANS: T PTS: 1

MULTIPLE CHOICE

31. Firms undertake quality and process improvement efforts to achieve all the following goals except
    a. Cost reduction
    b. Increased market share
    c. Customer satisfaction enhancement
    d. Increased customer loyalty
    e. Improved market performance

ANS: B
Page 30

PTS: 1

32. Which of the following is not a broad category for the different types of costs associated with quality improvement?
    a. Internal failure costs
    b. External failure costs
    c. Inventory costs
    d. Assurance costs
    e. Prevention costs

ANS: C
Page 30

PTS: 1

33. An example of internal failure costs is
    a. Rework costs
    b. Training costs
    c. Inspection costs
    d. Sampling costs
    e. Nondestructive testing costs

ANS: A
Page 31

PTS: 1

34. An example of an assurance cost associated with the cost of quality is
    a. Rework cost
    b. Scrap costs
    c. Replacement costs
    d. Inspection costs
    e. Training costs

ANS: D
Page 31

35. Which of the following is considered a "prevention cost" of quality?
    a. Cost of rework of products that failed
    b. Cost of training
    c. Cost of testing equipment used in appraisal
    d. Negative word of mouth
    e. Cost of lost production

ANS: B
Page 31

PTS: 1

36. As quality levels increase, _____.
    a. Internal costs decrease
    b. Internal costs increase
    c. External failure costs increase
    d. Assurance costs decrease
    e. Prevention costs decrease

ANS: A

Page 31

PTS: 1

37. In the long term, which of the following is not the result of an organization's quality improvement efforts?
    a. Higher customer satisfaction
    b. Positive word of mouth
    c. Food reputation
    d. Increased market share
    e. Employee turnover rate

    ANS: E
    Page 32

    PTS: 1

38. Which of the following is not considered a dimension of service quality?
    a. Responsiveness
    b. Competence
    c. Access
    d. Special features
    e. Courtesy

    ANS: D
    Page 33

    PTS: 1

39. A dimension of service and product quality that refers to the performance consistency of the goods or service is
    a. Responsiveness
    b. Reliability
    c. Communication
    d. Durability
    e. Serviceability

    ANS: B
    Page 33

    PTS: 1

410. Which of the following is not considered a dimension of product quality?
    a. Performance
    b. Communication
    c. Reliability
    d. Durability
    e. Serviceability

    ANS: B
    Page 33

    PTS: 1

41. Which term refers to a customer associating the quality of a product with the image of the company?
    a. Reputation
    b. Aesthetics
    c. Special features
    d. Durability
    e. Conformance

    ANS: A

Page 33

PTS: 1

42. Security as a dimension of service quality means
    a. The willingness to assist customers
    b. Having the knowledge to perform the service
    c. Recognizing that confidentiality is important in service delivery
    d. The service provider's politeness and friendliness
    e. Physical characteristics of the service provider

ANS: C
Page 35

PTS: 1

43. Customer expectations related to quality are influenced by all the following except
    a. Personal needs
    b. Word of mouth
    c. Reputation
    d. Internal defect rates
    e. Past experience

ANS: D
Page 35

PTS: 1

44. Because it is impossible for a quality inspector to check each individual product to ensure that it meets the specifications, companies started using
    a. Sampling
    b. ISO quality standards
    c. 100% inspection
    d. Continuous improvement
    e. Color coding

ANS: A
Page 36

PTS: 1

45. The award created by the U.S. government in 1987 to help improve quality and competitiveness of U.S. companies by recognizing the highest performing organizations is the
    a. Deming Prize
    b. Malcolm Baldrige National Quality Award
    c. American Society for Quality Achievement Award
    d. Lombardi Trophy
    e. The Academy of Quality National Award

ANS: B
Page 37

PTS: 1

46. Which of the following concepts was not considered by Deming as an important point for quality and process improvement?
    a. Cease dependence on inspection
    b. End the practice of awarding business on the basis of the price tag
    c. Institute training on the job
    d. Eliminate slogans
    e. Reward people for doing a job correctly with a large bonus

    ANS: E
    Page 38

    PTS: 1

47. Which of the following is not one of the four quality absolutes as defined by Philip Crosby?
    a. Quality is defined as conformance to requirements.
    b. The system for causing quality is prevention , not appraisal.
    c. Management must enforce quality levels.
    d. The performance standard must have zero defects.
    e. The measurement of quality is the price of nonconformance.

    ANS: C
    Page 39

    PTS: 1

48. Which of the following is not a well-known quality guru?
    a. Adam Smith
    b. Phillip Crosby
    c. Armand Feigenbaum
    d. Joseph Juran
    e. Genichi Taguchi

    ANS: A
    Page 39

    PTS: 1

49. Choose the statement that most closely describes a total quality management system.
    a. Detection of defects
    b. Prevention of defects
    c. Inspection for defects
    d. Conformance to specifications
    e. Correction of defects

    ANS: B
    Page 41

    PTS: 1

50. A diagram that visually displays all possible causes of a quality problem with the goal of finding the reasons for the imperfections is a
    a. Deming chart
    b. Pareto diagram
    c. Quality dyad
    d. Cause-and-effect diagram
    e. PDCA cycle

    ANS: D
    Page 39

PTS: 1

51. What percentage of the area of a normal curve is between +2 and -2 standard deviations?
a. 0%
b. 68.3%
c. 95.5%
d. 99.7%
e. 100%

ANS: C
Page 51

PTS: 1

52. When computing the process sigma, the percentage of defective products can be found by finding the area _____in a cumulative normal distribution curve.
a. between the UTL and LTL
b. below the LTL
c. beyond the LTL
d. outside the UTL and LTL
e. under the curve

ANS: C
Page 52

PTS: 1

53. In reality, on the basis of computations, a Six Sigma process quality level is equivalent to the LTL and the UTL's being how many standard deviations away from the extreme position of the mean?
a. 1.5 standard deviations
b. 3 standard deviations
c. 4.5 standard deviations
d. 6 standard deviations
e. 12 standard deviations

ANS: C
Page 53

PTS: 1

54. The Six Sigma approach described in the text is implemented using a structured five-step plan known as
a. ISO implementation procedure
b. Deming's 14 points
c. The Taguchi function
d. DMAIC
e. MBNQA

ANS: D
Page 56

PTS: 1

55. Quality improvement efforts are often credited with reducing
a. The number of found defects
b. Overall production costs
c. The number of sales personnel
d. Quality initiatives
e. The required number of control charts

ANS: B
Page 59

PTS: 1

SHORT ANSWER

56. What are the four parts of the Deming cycle for continuous improvement?

ANS:
Plan, Do, Check, Act
Page 39

PTS: 1

57. What is a quality circle?

ANS:
A quality circle is a small group of employees who are responsible for similar or related work functions. This volunteer group meets regularly to identify, analyze, and solve quality and production problems related to its work.
Page 39

PTS: 1

58. Briefly describe Dr. Edward Deming's contribution to quality.

ANS:
Deming is often considered the father of modern quality management. He emphasized the philosophy of continuous improvement**.** He taught that the quest for quality is a never-ending journey. Deming also created simple-to-understand examples and visuals for teaching quality management concepts. For example, he summarized his teachings in 14 points, which continue to be used as a guide for quality management by practicing managers (see Table 2.1). He summarized his continuous improvement philosophy using a simple diagram of a wheel with four activities: Plan, Do, Check, and Act (see Figure 2.5). Deming was also instrumental in teaching statistical quality control (SQC) to managers.

Page 38

PTS: 1

59. What is the Malcolm Baldrige National Quality Award?

ANS:
It was created by the U.S. government in 1987 to help improve the quality and competitiveness of U.S. companies by recognizing the highest-performing organizations in the manufacturing, service, health-care, education, and small business categories.
Page 45

PTS: 1

60. Describe how "managing by fact" influences TQM.

ANS:
TQM emphasizes the need for using objective data rather than subjective perceptions when making managerial decisions. It advocates the use of statistical techniques such as statistical process control and the design of experiments for collecting and analyzing data.
Page 47

PTS: 1

61. Describe how ISO 9000 standards can benefit consumers.

ANS:
For consumers, conformity of products and services to international standards provides assurance of the quality, safety, and reliability of those products and services.
Page 42

PTS: 1

62. Discuss how customer expectations can influence the assessment of quality.

ANS:
Customer expectations are influenced by many different factors, such as personal needs, word of mouth or the reputation of the company, and individuals' own past experiences. Therefore, a customer compares the objective quality of a product based on the dimensions described earlier with his or her expectations. Based on such comparisons, the perceived quality of the product is thought to be higher or lower than expectations. Therefore, quality excellence means improving the dimensions of both objective and perceived product quality.
Page 35

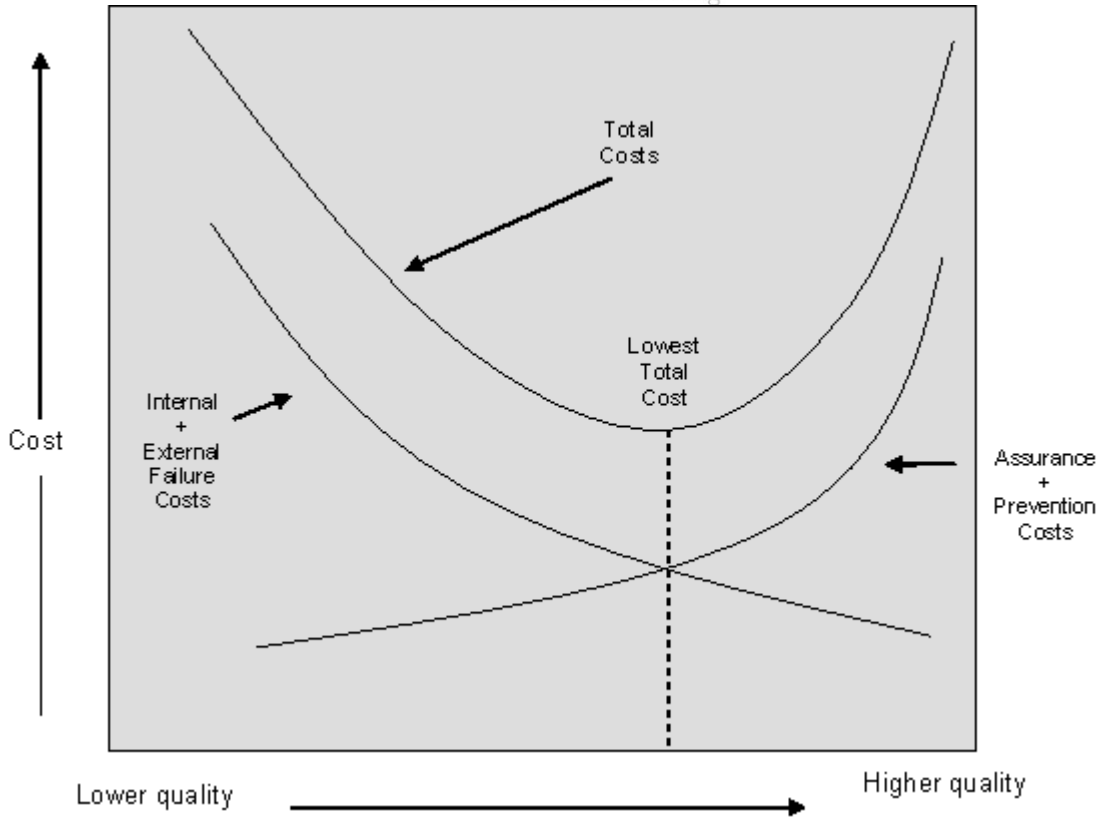
63. Describe internal failure cost, with an example in a local restaurant.

ANS:
If a defective good (or service) is produced but the error is caught before the product leaves the production facility, then all costs associated with rework, scrap, and lost production time are classified as internal failure cost. For example, suppose that a customer ordered a thin-crust pizza with only vegetarian toppings. Let us assume that the pizza delivery company made a mistake in the order-taking process and produced a pizza with a thick crust and a pepperoni topping, but caught this mistake before the driver could deliver the pizza to the customer. All the costs associated with this mistake (i.e., the waste of a fully cooked pizza and the equipment and employee time used in the production of the wrong pizza) will be classified in the internal failure cost category.
Page 30

PTS: 1

64. Sketch the cost of quality curve.

ANS:



See figure 2.1, page 31.

PTS: 1

65. Identify and describe four of the dimensions of product quality discussed in the textbook.

ANS:

- *Performance.* This refers to the primary purpose of a tangible good.
- *Special features.* Special features are additional characteristics of a tangible good that enhance the value or usefulness of the primary purpose of the product.
- *Reliability*. Consistency in the performance of a good is measured by its reliability. A good with higher reliability is considered to have higher quality than a good with lower reliability.
- *Conformance*. Conformance is the degree to which a good matches the prespecified standards or guidelines.
- *Durability*. Durability refers to the useful life of a good. The longer the useful life, the higher the quality.
- *Serviceability*. The ability of the good to perform with ease is also a measure of its quality.

- *Aesthetics*. A good's appearance is often considered to be a dimension of its quality.
- *Brand equity or reputation.* Often customers associate the quality of a good with the image of the company, its brand name, or its past reputation. These indirect measures of quality are collectively called brand equity.

PTS: 1

PROBLEMS

66. For a given process, past data reveals that the mean of the process is 9 and the standard deviation is 3. Tolerance limits are specified as UTL = 16 and LTL = 2. What would the process sigma be for this process using the UTL?

ANS:

$$\text{Process sigma} = \frac{16-9}{3} = 2.33$$

PTS: 1

67. For a given process, past data reveals that the mean of the process is 9 and the standard deviation is 3. Tolerance limits are specified as UTL = 16 and LTL = 2. What would the percent defective be for this process using the UTL?

ANS:
This solution will vary depending on the area under the standard normal curve table that is used in the book. Using a table that provides the area to the left of the z-score, you will have the following solution:

P(Z?= 2.33) = 0.9901 (using the table)
The problem is asking for the area to the right of 2.33.
Percentage of defective products = (1 − 0.9901)* 100% = 0.9%

PTS: 1

68. A machine shop requires a specific hardness range on purchased iron blocks. A machine is used to test the hardness. To be acceptable, the hardness readings need to be between a UTL of 366 and an LTL of 335. The supplier reports that the mean hardness is 350, with a standard deviation of 7. Calculate the process sigma using the LTL.

ANS:

$$\text{Process sigma} = \frac{350-335}{7} = 2.14$$

PTS: 1

69. A machine shop requires a specific hardness range on purchased iron blocks. A machine is used to test the hardness. To be acceptable, the hardness readings need to be between a UTL of 366 and an LTL of 335. The supplier reports that the mean hardness is 350, with a standard deviation of 7. What would the percent defective be for this process using the LTL?

ANS:

P(Z= 2.14) = 0.9901 (using the table)
The problem is asking for the area to the right of 2.14:
percent defective products = (1 − 0.9838)* 100% = 1.62%

PTS: 1

70. A machine shop requires a specific hardness range on purchased iron blocks. A machine is used to test the hardness. To be acceptable, the hardness readings need to be between a UTL of 366 and an LTL of 335. The supplier reports that the mean hardness is 350, with a standard deviation of 7. The Z-score is 2.33 for a defective rate of less than 1%. What standard deviation is required if the UTL is used to compute the process sigma?

ANS:

Process sigma = $\frac{366-350}{\sigma}$ = 2.33

Standard deviation = $\frac{16}{2.33}$ = 6.87

PTS: 1

71. Pete's Pizza promises delivery to your home or office in under an hour. His goal is to deliver all Pizzas between 20 and 60 minutes. Records indicate the average delivery time is 38 minutes, with a standard deviation of 3 minutes. Is the company delivering within Six Sigma quality levels with respect to delivery time?

ANS:

Actual upper (mean + 6*σ) value = 38 + 6*3 = 56
Actual lower (mean + 6*σ) value = 38 - 6*3 = 20
Yes, the promised time is within 6 standard deviations of the mean.

PTS: 1

72. Pete's sister Patty runs a similar restaurant called Patty's Pizza with the same 1-hour delivery promise. Her delivery records show a mean delivery time of 40 minutes, with a standard deviation of 5 minutes. She does not meet Six Sigma quality levels for delivery time. What does her standard deviation need to be to achieve Six Sigma quality levels for delivery?

ANS:

The distance from the mean to either the LTL or the UTL is 20 minutes. To achieve Six Sigma Quality levels, 6 * σ needs to equal 20.

$$6^* \sigma = 20; \ \sigma = 3.33$$

PTS: 1

73. Jay Jones bought Matt's Mechanics Service. Matt told Jay that his three primary processes, diagnosis, repair and customer delivery, met internal goals 95% of the time, so he assumed customers were satisfied 95% of the time. Jay disagrees and wants to know how often customers have an error-free outcome. What would you tell him?

ANS:
0.95 * 0.95 * 0.95 = 0.8574 = 85.74% error-free outcomes

PTS: 1

74. Jay decides to try to improve each process so that the percentage of error-free outcomes will be at least 95%. What will each process need to be to reach this goal?

ANS:

Process 1 * Process 2 * Process 3 = 0.95
$\text{Process}^3 = 0.95$
$\text{Process} = 0.95^{0.33} = 0.9830$

Each process will have to be error free 98.3% of the time for the outcome to be error free 95% of the time.

PTS: 1

75. The local university's Admissions' office has four steps required in the admissions process. Applications must be entered in the system, reviewed for accuracy, reviewed by the admissions team, and a letter of acceptance or rejection must be sent. To provide timely feedback, each step has a time goal. Applications are entered in the system faster than the goal 94% of the time. The accuracy review is faster than the goal 98.5% of the time. The review team only beats the goal 88.4% of the time. The letter is issued faster than the goal 99% of the time. What is the timeliness of the process?

ANS:
0.94 * 0.985 * 0.884 * 0.99 = 0.8103, or 81.03% of the time

PTS: 1