

Analytics, Data Science, & Artificial Intelligence, 11e (Sharda)
Chapter 1 Overview of Business Intelligence, Analytics, Data Science, and Artificial Intelligence: Systems for Decision Support

- 1) In the opening case KONE has minimized downtime and shortened the repair time.
Answer: TRUE
Diff: 2 Page Ref: 4
- 2) Intelligent technologies are limited to small-scale projects when they include AI combined with IoT.
Answer: FALSE
Diff: 2 Page Ref: 5
- 3) Decision making is one of the most important activities in organizations of all kind– probably the most important one.
Answer: TRUE
Diff: 1 Page Ref: 5
- 4) Managers historically considered decision making purely a science.
Answer: FALSE
Diff: 1 Page Ref: 6
- 5) With more data and analysis technologies, more alternatives can be evaluated, forecasts can be improved, risk analysis can be performed quickly, and the views of experts can be collected quickly and at a reduced cost.
Answer: TRUE
Diff: 2 Page Ref: 8
- 6) It is generally best to rely on a trial-and-error approach to management.
Answer: FALSE
Diff: 2 Page Ref: 7
- 7) A major characteristic of computerized decision support and many BI tools (notably those of business analytics) is the inclusion of at least one model.
Answer: TRUE
Diff: 2 Page Ref: 13
- 8) The definition of implementation is straightforward because implementation is a simple, direct process with defined boundaries.
Answer: FALSE
Diff: 2 Page Ref: 13
- 9) Structured problems are encountered in only unique situations.
Answer: FALSE
Diff: 3 Page Ref: 16

10) Unstructured problems can be fully supported by standard computerized quantitative methods.

Answer: FALSE

Diff: 3 Page Ref: 16

11) During the 1990s, the primary focus of information systems support for decision making focused on providing structured, periodic reports that a manager could use for decision making.

Answer: FALSE

Diff: 3 Page Ref: 22

12) Decision support systems couple the intellectual resources of individuals with the capabilities of the computer to improve the quality of decisions. It is a computer-based support system for management decision makers who deal with semistructured problems.

Answer: TRUE

Diff: 2 Page Ref: 22

13) The term *decision support system* is a very specific term that implies the same tool, system, and development approach to most developers.

Answer: FALSE

Diff: 3 Page Ref: 23

14) BI systems rely on a DW as the information source for creating insight and supporting managerial decisions.

Answer: TRUE

Diff: 2 Page Ref: 27

15) One of the four components of BI systems, business performance management, is a collection of source data in the data warehouse.

Answer: FALSE

Diff: 3 Page Ref: 25

16) Analytics is the process of developing actionable decisions or recommendations for actions based on insights generated from historical data.

Answer: TRUE

Diff: 3 Page Ref: 31

17) The use of dashboards and data visualizations is seldom effective in finding efficiencies in organizations, as demonstrated by the Seattle Children's Hospital Case Study.

Answer: FALSE

Diff: 2 Page Ref: 32

18) The use of statistics in baseball by the Oakland Athletics, as described in the *Moneyball* book, is an example of the effectiveness of prescriptive analytics.

Answer: TRUE

Diff: 2 Page Ref: 39

19) Pushing programming out to distributed data is achieved solely by using the Hadoop Distributed File System or HDFS.

Answer: FALSE

Diff: 2 Page Ref: 37

20) Volume, velocity, and variety of data characterize the Big Data paradigm.

Answer: TRUE

Diff: 2 Page Ref: 60

21) What type of external decision-making factor are included by government policy?

A) political factors

B) economic factors

C) sociological and psychological factors

D) environmental factors

Answer: A

Diff: 3 Page Ref: 6-7

22) What type of external decision-making factor are related to a country's market growth and financial conditions?

A) political factors

B) economic factors

C) sociological and psychological factors

D) environmental factors

Answer: B

Diff: 3 Page Ref: 6-7

23) What type of external decision-making factor are related to a company's ecosystem?

A) political factors

B) economic factors

C) sociological and psychological factors

D) environmental factors

Answer: D

Diff: 3 Page Ref: 6-7

24) Organization objectives comes in what stage of the decision-making process?

A) intelligence

B) design

C) choice

D) implementation

Answer: A

Diff: 2 Page Ref: 10

25) Setting the criteria for a choice comes in what stage of the decision-making process?

- A) intelligence
- B) design
- C) choice
- D) implementation

Answer: B

Diff: 2 Page Ref: 10

26) Sensitivity analysis comes in what stage of the decision-making process?

- A) intelligence
- B) design
- C) choice
- D) implementation

Answer: C

Diff: 2 Page Ref: 10

27) What is the conceptualization of a problem in an attempt to place it in a definable category, possibly leading to a standard solution approach?

- A) problem classification
- B) problem decomposition
- C) problem ownership
- D) problem design

Answer: A

Diff: 2 Page Ref: 12

28) What problem-solving step is based on the understanding that solving the simpler subproblems may help in solving a complex problem?

- A) problem classification
- B) problem decomposition
- C) problem ownership
- D) problem design

Answer: B

Diff: 2 Page Ref: 12

29) In the classic decision support framework, types of decisions are broken apart into all except one of the following categories.

- A) structured
- B) semistructured
- C) unstructured
- D) undefined

Answer: D

Diff: 2 Page Ref: 14-15

30) In the classic decision support framework, types of control are broken apart into all except one of the following categories.

- A) operational control
- B) managerial control
- C) strategic planning
- D) financial control

Answer: D

Diff: 2 Page Ref: 15

31) What type of analytics answers questions like "what happened?"

- A) descriptive
- B) predictive
- C) prescriptive
- D) business intelligence

Answer: A

Diff: 2 Page Ref: 31

32) All of the following have contributed to the growth of decision support systems EXCEPT:

- A) Group communication and collaboration.
- B) Improved data management.
- C) Anywhere, anytime support.
- D) Increasing costs of computer hardware.

Answer: D

Diff: 2 Page Ref: 7-9

33) Business intelligence (BI) can be characterized as a transformation of:

- A) data to information to decisions to actions.
- B) Big Data to data to information to decisions.
- C) actions to decisions to feedback to information.
- D) data to processing to information to actions.

Answer: A

Diff: 3 Page Ref: 25

34) Deep learning would be classified as what stage in the evolution of decision support, business intelligence, analytics & AI?

- A) Executive IT
- B) Business Intelligence
- C) Analytics
- D) Automation

Answer: D

Diff: 3 Page Ref: 22

- 35) Predictive analytics aims to:
- A) understand what happened in the past
 - B) understand why something happened in the past
 - C) determine what is likely to happen in the future
 - D) describe what is currently occurring

Answer: C

Diff: 3 Page Ref: 33

- 36) What type of analytics answers questions like "what will happen?"

- A) descriptive
- B) predictive
- C) prescriptive
- D) business intelligence

Answer: B

Diff: 2 Page Ref: 31

- 37) What type of analytics answers questions like "what should I do?"

- A) descriptive
- B) predictive
- C) prescriptive
- D) business intelligence

Answer: C

Diff: 2 Page Ref: 31

- 38) When examining the analytic application of market basket analysis, which business question is not being asked?

- A) What products should I combined to create a bundle offer?
- B) Should I combined products based on slow-moving and fast-moving characteristics?
- C) What customer is buying what product at what location?
- D) Should I create a bundle from the same category or a different category line?

Answer: C

Diff: 3 Page Ref: 48

- 39) Which of the following statements about Big Data is true?

- A) Data chunks are stored in different locations on one computer.
- B) Hadoop is a type of processor used to process Big Data applications.
- C) MapReduce is a storage filing system.
- D) Pure Big Data systems do not involve fault tolerance.

Answer: D

Diff: 3 Page Ref: 37

40) Big Data often involves a form of distributed storage and processing using Hadoop and MapReduce. One reason for this is:

- A) centralized storage creates too many vulnerabilities.
- B) the "Big" in Big Data necessitates over 10,000 processing nodes.
- C) the processing power needed for the centralized model would overload a single computer.
- D) Big Data systems have to match the geographical spread of social media.

Answer: C

Diff: 3 Page Ref: 37

41) To follow these decision-making processes, one must make sure that sufficient _____ solutions, including good ones, are being considered.

Answer: alternative

Diff: 2 Page Ref: 6

42) Using _____ technology, managers can access information anytime and from any place, analyze and interpret it, and communicate with those using it.

Answer: wireless

Diff: 2 Page Ref: 8

43) _____ is a process of choosing among two or more alternative courses of action for the purpose of attaining one or more goals.

Answer: Decision making

Diff: 2 Page Ref: 9

44) The _____ phase includes the selection of a proposed solution to the model (not necessarily to the problem it represents).

Answer: choice

Diff: 2 Page Ref: 10

45) One issue with data _____ is that it is often subjective.

Answer: estimation

Diff: 2 Page Ref: 11

46) The _____ phase involves putting a recommended solution to work.

Answer: implementation

Diff: 2 Page Ref: 13

47) In a(n) _____ problem, the procedures for obtaining the best (or at least a good enough) solution are known.

Answer: structured

Diff: 2 Page Ref: 14

48) A(n) _____ problem such as new technology development is one that has very few structured elements.

Answer: unstructured

Diff: 2 Page Ref: 14

49) _____ is an umbrella term that combines architectures, tools, databases, analytical tools, applications, and methodologies.

Answer: Business intelligence (BI)

Diff: 2 Page Ref: 25

50) A(n) _____ is a major component of a Business Intelligence (BI) system that holds source data.

Answer: data warehouse

Diff: 2 Page Ref: 25

51) A(n) _____ is a major component of a Business Intelligence (BI) system that is usually browser based and often presents a portal or dashboard.

Answer: user interface

Diff: 2 Page Ref: 20

52) _____ is defined as "interactive computer-based systems, which help decision makers utilize data and models to solve unstructured problems."

Answer: DSS

Diff: 2 Page Ref: 22

53) _____ is an umbrella term that combines architectures, tools, databases, analytical tools, applications, and methodologies. It is, like DSS, a content-free expression

Answer: Business intelligence (BI)

Diff: 2 Page Ref: 25

54) The goal of _____ analytics is to recognize what is going on as well as the likely forecast and make decisions to achieve the best performance possible.

Answer: prescriptive

Diff: 2 Page Ref: 34

55) _____ analytics help managers understand current events in the organization including causes, trends, and patterns.

Answer: Descriptive

Diff: 2 Page Ref: 32

56) _____ analytics help managers understand probable future outcomes.

Answer: Predictive

Diff: 2 Page Ref: 33

57) _____ refers to data that cannot be stored in a single storage unit and typically refers to data that come in many different forms: structured, unstructured, in a stream, and so forth.

Answer: Big Data

Diff: 2 Page Ref: 37

58) An online retail site usually knows its customer as soon as the customer signs in, and thus they can offer _____ pages/offerings to enhance the experience.

Answer: customized

Diff: 2 Page Ref: 47

59) AI is sometimes described as technology that can learn to do things _____ over time.

Answer: better

Diff: 2 Page Ref: 52

60) To exhibit real intelligence, machines need to perform the _____ range of human cognitive capabilities.

Answer: full

Diff: 2 Page Ref: 55

61) Describe the four step process of management decision-making.

Answer: Managers usually make decisions by following a four-step process:

1. Define the problem (i.e., a decision situation that may deal with some difficulty or with an opportunity).

2. Construct a model that describes the real-world problem.

3. Identify possible solutions to the modeled problem and evaluate the solutions.

4. Compare, choose, and recommend a potential solution to the problem.

Diff: 2 Page Ref: 6

62) Identify one technology for data analysis and decision support and briefly discuss its impact.

Answer: Student selections and discussions will differ.

Diff: 2 Page Ref: 7-8

63) Draw a model of the decision making/modeling process.

Answer: Student drawings may vary, but will closely resemble figure 1.1.

Diff: 2 Page Ref: 10

64) List some of the issues involved in data collection.

Answer: The following are some issues that may arise during data collection and estimation and thus plague decision makers:

- Data are not available. As a result, the model is made with and relies on potentially inaccurate estimates.
- Obtaining data may be expensive.
- Data may not be accurate or precise enough.
- Data estimation is often subjective.
- Data may be insecure.
- Important data that influence the results may be qualitative (soft).
- There may be too many data (i.e., information overload).
- Outcomes (or results) may occur over an extended period. As a result, revenues, expenses, and profits will be recorded at different points in time. To overcome this difficulty, a present-value approach can be used if the results are quantifiable.
- It is assumed that future data will be similar to historical data. If this is not the case, the nature of the change has to be predicted and included in the analysis.

Diff: 2 Page Ref: 11

65) Describe the types of computer support that can be used for structured, semistructured, and unstructured decisions.

Answer:

- **Structured Decisions:** Structured problems, which are encountered repeatedly, have a high level of structure. It is therefore possible to abstract, analyze, and classify them into specific categories and use a scientific approach for automating portions of this type of managerial decision making.
- **Semistructured Decisions:** Semistructured problems may involve a combination of standard solution procedures and human judgment. Management science can provide models for the portion of a decision-making problem that is structured. For the unstructured portion, a DSS can improve the quality of the information on which the decision is based by providing, for example, not only a single solution but also a range of alternative solutions, along with their potential impacts.
- **Unstructured Decisions:** These can be only partially supported by standard computerized quantitative methods. It is usually necessary to develop customized solutions. However, such solutions may benefit from data and information generated from corporate or external data sources.

Diff: 2 Page Ref: 15-16

66) What are the four major components of a BI system?

Answer:

1. A **data warehouse**, with its source data;
2. **Business analytics**, a collection of tools for manipulating, mining, and analyzing the data in the data warehouse;
3. **Business performance management (BPM)** for monitoring and analyzing performance; and
4. A **user interface** (e.g., a dashboard).

Diff: 3 Page Ref: 26

67) List and describe three levels or categories of analytics that are most often viewed as sequential and independent, but also occasionally seen as overlapping.

Answer:

- **Descriptive or reporting analytics** refers to knowing what is happening in the organization and understanding some underlying trends and causes of such occurrences.
- **Predictive analytics** aims to determine what is likely to happen in the future. This analysis is based on statistical techniques as well as other more recently developed techniques that fall under the general category of data mining.
- **Prescriptive analytics** recognizes what is going on as well as the likely forecast and make decisions to achieve the best performance possible.

Diff: 3 Page Ref: 31-35

68) List and briefly discuss the major benefits of AI.

Answer: The major benefits of AI are as follows:

- Significant reduction in the cost of performing work. This reduction continues over time while the cost of doing the same work manually increases with time.
- Work can be performed much faster.
- Work is consistent in general, more consistent than human work.
- Increased productivity and profitability as well as a competitive advantage are the major drivers of AI.

Diff: 3 Page Ref: 52

69) Describe and define Big Data. Why is a search engine a Big Data application?

Answer:

- Big Data is data that cannot be stored in a single storage unit. Big Data typically refers to data that is arriving in many different forms, be they structured, unstructured, or in a stream. Major sources of such data are clickstreams from Web sites, postings on social media sites such as Facebook, or data from traffic, sensors, or weather.
- A Web search engine such as Google needs to search and index billions of Web pages in order to give you relevant search results in a fraction of a second. Although this is not done in real time, generating an index of all the Web pages on the Internet is not an easy task.

Diff: 3 Page Ref: 37

70) Select an analytic application and discuss its related business questions and business values (hint: see table 1.1)

Answer: Student selection of applications will vary, but good details on the questions and values are found in table 1.1.

Diff: 2 Page Ref: 48