CHAPTER 1: DATABASE SYSTEMS

1. Data and information are essentially the same thing.
   a. True
   b. False

   ANSWER: False
   PTS: 1 DIF: Difficulty: Easy REF: p.4
   NAT: BUSPROG: Technology STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge TOP: Data versus Information

2. Data processing can be as simple as organizing data to reveal patterns.
   a. True
   b. False

   ANSWER: True
   PTS: 1 DIF: Difficulty: Easy REF: p.4
   NAT: BUSPROG: Technology STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge TOP: Data versus Information

3. Data is the result of processing raw facts to reveal its meaning.
   a. True
   b. False

   ANSWER: False
   PTS: 1 DIF: Difficulty: Easy REF: p.4
   NAT: BUSPROG: Technology STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge TOP: Data versus Information

4. When data are entered into a form and saved, they are placed in the underlying database as knowledge.
   a. True
   b. False

   ANSWER: False
   PTS: 1 DIF: Difficulty: Moderate REF: p.4
   NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
   KEY: Bloom's: Comprehension TOP: Data versus Information

5. Data constitute the building blocks of information.
   a. True
   b. False

   ANSWER: True
   PTS: 1 DIF: Difficulty: Easy REF: p.4
   NAT: BUSPROG: Technology STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge TOP: Data versus Information

6. Metadata describe the data characteristics and the set of relationships that links the data found within the database.
   a. True
   b. False

   ANSWER: True
   PTS: 1 DIF: Difficulty: Easy REF: p.6
   NAT: BUSPROG: Technology STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge TOP: Introducing the Database

7. The only way to access the data in a database is through the DBMS.
   a. True
   b. False

   ANSWER: True
   PTS: 1 DIF: Difficulty: Moderate REF: p.6
   NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
   KEY: Bloom's: Comprehension TOP: Introducing the Database

8. Database programming languages receive all application requests and translate them into the complex operations required to fulfill those requests.
   a. True
   b. False

   ANSWER: False
   PTS: 1 DIF: Difficulty: Moderate REF: p.6
   NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
   KEY: Bloom's: Comprehension TOP: Introducing the Database

9. The DBMS reveals much of the database's internal complexity to the application programs and users.
   a. True
   b. False

   ANSWER: False
   PTS: 1 DIF: Difficulty: Moderate REF: p.6
   NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
   KEY: Bloom's: Comprehension TOP: Introducing the Database

10. One disadvantage of the DBMS is that it increases the risk of data security breaches.
    a. True
    b. False

    ANSWER: False
    PTS: 1 DIF: Difficulty: Easy REF: p.7
    NAT: BUSPROG: Technology STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge TOP: Introducing the Database

11. An operational database is sometimes referred to as an enterprise database.
    a. True
    b. False

    ANSWER: False
    PTS: 1 DIF: Difficulty: Easy REF: p.9
    NAT: BUSPROG: Technology STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge TOP: Introducing the Database

12. A data warehouse can store data derived from many sources.
    a. True
    b. False

    ANSWER: True
    PTS: 1 DIF: Difficulty: Easy REF: p.9
    NAT: BUSPROG: Technology STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge TOP: Introducing the Database

13. The same data might be simultaneously structured and unstructured depending on the intended processing.
    a. True
    b. False

    ANSWER: True
    PTS: 1 DIF: Difficulty: Moderate REF: p.9
    NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
    KEY: Bloom's: Comprehension TOP: Introducing the Database

14. Corporations use only structured data.
    a. True
    b. False

    ANSWER: False
    PTS: 1 DIF: Difficulty: Moderate REF: p.10
    NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
    KEY: Bloom's: Comprehension TOP: Introducing the Database

15. Field refers to a collection of related records.
    a. True
    b. False

    ANSWER: False
    PTS: 1 DIF: Difficulty: Easy REF: p.15
    NAT: BUSPROG: Technology STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge TOP: Evolution of File System Data Processing

16. Structural dependence exists when it is possible to make changes in the file structure without affecting the application program's ability to access the data.
    a. True
    b. False

ANSWER: False
PTS: 1 DIF: Difficulty: Moderate REF: p.19
NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
KEY: Bloom's: Comprehension TOP: Problems with File System Data Processing

17. Data anomaly is defined as the condition in which all of the data in the database are consistent with the real-world events and conditions.
    a. True
    b. False

ANSWER: False
PTS: 1 DIF: Difficulty: Easy REF: p.21
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Problem with File System Data Processing

18. One disadvantage of a database system over previous data management approaches is increased costs.
    a. True
    b. False

ANSWER: True
PTS: 1 DIF: Difficulty: Easy REF: p.28
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Database System

19. An advantage of database systems is that you needn't perform frequent updates and apply latest patches.
    a. True
    b. False

ANSWER: False
PTS: 1 DIF: Difficulty: Moderate REF: p.28
NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
KEY: Bloom's: Comprehension TOP: Database System

20. One advantage of a database system over previous data management approaches is that the database system is considerably less complex.
    a. True
    b. False

ANSWER: False
PTS: 1 DIF: Difficulty: Moderate REF: p.28
NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
KEY: Bloom's: Comprehension TOP: Database System

21. _____is the result of revealing the meaning of raw facts.
    a. End-user data b. An encoded sample
    c. An encrypted bit d. Information

ANSWER: d
PTS: 1 DIF: Difficulty: Easy REF: p.4
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Data versus Information

22. _____is the body of information and facts about a specific subject.

a. Validation b. A format

c. Knowledge d. A database

ANSWER: c

PTS: 1 DIF: Difficulty: Easy REF: p.5
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Data versus Information

23. Accurate, relevant, and timely information is the key to_____

a. data management b. good decision making

c. knowledge d. understanding

ANSWER: b

PTS: 1 DIF: Difficulty: Moderate REF: p.5
NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
KEY: Bloom's: Comprehension TOP: Data versus Information

24. End-user data is_____.

a. knowledge about the end users b. raw facts of interest to the end user

c. information about a specific subject d. accurate, relevant and timely information

ANSWER: b

PTS: 1 DIF: Difficulty: Easy REF: p.6
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

25. _____provide a description of the data characteristics and the set of relationships that link the data found within the database.

a. Queries b. End-user data

c. Metadata d. Schemas

ANSWER: c

PTS: 1 DIF: Difficulty: Easy REF: p.6
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

26. _____serve as the intermediary between the user and the database.

a. DBMSs b. Metadata

c. End-user data d. Programming languages

ANSWER: a

PTS: 1 DIF: Difficulty: Easy REF: p.6
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

27. The database structure in a DBMS is stored as a_____.

a. single file b. collection of files

c. set of key/value pairs d. collection of queries

ANSWER: b
PTS: 1 DIF: Difficulty: Easy REF: p.6
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

28. A(n)_____might be written by a programmer or it might be created through a DBMS utility program.
a. query b. operating system
c. database management system d. application

ANSWER: d
PTS: 1 DIF: Difficulty: Easy REF: p.6
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

29. _____exists when different versions of the same data appear in different places.
a. Data inconsistency b. Poor data security
c. Structural dependence d. Conceptual dependence

ANSWER: a
PTS: 1 DIF: Difficulty: Easy REF: p.7
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

30. The response of the DBMS to a query is the_____.
a. ad hoc query b. ad hoc response
c. query result set d. integrated view of the data

ANSWER: c
PTS: 1 DIF: Difficulty: Easy REF: p.7
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

31. A(n)_____database is used by an organization and supports many users across many departments.
a. desktop b. workgroup
c. enterprise d. transactional

ANSWER: c
PTS: 1 DIF: Difficulty: Easy REF: p.8
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

32. A(n)_____database supports a relatively small number of users (usually fewer than 50) or a specific department within an organization.
a. desktop b. workgroup
c. enterprise d. transactional

ANSWER: b
PTS: 1 DIF: Difficulty: Easy REF: p.8
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

33. A workgroup database is a(n)_____database.

a. single-user b. multiuser

c. desktop d. distributed

ANSWER: b

PTS: 1 DIF: Difficulty: Easy REF: p.8
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

34. A desktop database is a_____database.

a. single-user b. multiuser

c. workgroup d. distributed

ANSWER: a

PTS: 1 DIF: Difficulty: Easy REF: p.8
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

35. Data warehouse contains historical data obtained from the_____.

a. operational databases b. desktop database

c. enterprise databases d. workgroup databases

ANSWER: a

PTS: 1 DIF: Difficulty: Easy REF: p.9
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

36. _____data exist in the format in which they were collected.

a. Structured b. Semistructured

c. Unstructured d. Historical

ANSWER: c

PTS: 1 DIF: Difficulty: Easy REF: p.9
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

37. _____data exist in a format that does not lend itself to processing that yields information.

a. Structured b. Semistructured

c. Unstructured d. Historical

ANSWER: c

PTS: 1 DIF: Difficulty: Easy REF: p.9
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

38. _____are the result of formatting disorganized data in order to facilitate storage, use and generation of information.

a. Structured data b. Raw data

c. Unstructured data d. Obsolete data

ANSWER: a
PTS: 1 DIF: Difficulty: Easy REF: p.9
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

39. Most data that can be encountered are best classified as_____.
a. structured b. semistructured
c. unstructured d. historical

ANSWER: b
PTS: 1 DIF: Difficulty: Easy REF: p.10
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

40. An XML database supports the storage and management of_____XML data.
a. structured b. multistructured
c. fully structured d. semistructured

ANSWER: d
PTS: 1 DIF: Difficulty: Easy REF: p.10
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

41. The organization of data within folders in a manual file system is determined by_____.
a. its date of creation b. its expected use
c. the title of the documents in the folder d. the data processing specialist

ANSWER: b
PTS: 1 DIF: Difficulty: Moderate REF: p.14
NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
KEY: Bloom's: Comprehension TOP: Evolution of File System Data Processing

42. A_____is a logically connected set of one or more fields that describes a person, place, or thing.
a. database b. column
c. record d. file

ANSWER: c
PTS: 1 DIF: Difficulty: Easy REF: p.15
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Evolution of File System Data Processing

43. A_____is a collection of related records.
a. schema b. field
c. column d. file

ANSWER: d
PTS: 1 DIF: Difficulty: Easy REF: p.15
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Evolution of File System Data Processing

44. A_____is a character or group of characters that has a specific meaning.

a. database b. field

c. record d. file

ANSWER: b

PTS: 1 DIF: Difficulty: Easy REF: p.15
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Evolution of File System Data Processing

45. Which of the following is true of spreadsheet applications?

a. They provide enhanced security and robust data sharing features.

b. They do not allow manipulation of data once entered.

c. They are a better alternative to databases.

d. They enhance the user's ability to understand the data.

ANSWER: d

PTS: 1 DIF: Difficulty: Moderate REF: p.17
NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
KEY: Bloom's: Comprehension TOP: Evolution of File System Data Processing

46. Which of the following refers to the situation where different versions of the same data are stored at different places because they weren't updated consistently?

a. Data query b. Data integrity

c. Data dictionary d. Data redundancy

ANSWER: d

PTS: 1 DIF: Difficulty: Easy REF: p.20
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Problems with File System Data Processing

47. Data is said to be verifiable if:

a. the data always yields consistent results. b. the data cannot be changed or manipulated.

c. the data is obtained from trusted sources. d. the data is stored in different places within the database.

ANSWER: a

PTS: 1 DIF: Difficulty: Easy REF: p.20
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Problems with File System Data Processing

48. _____ is defined as the condition in which all of the data in the database are consistent with the real-world events and conditions.

a. Data integrity b. Data anomaly

c. Data ubiquity d. Data quality

ANSWER: a

PTS: 1 DIF: Difficulty: Easy REF: p.20
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Problems with File System Data Processing

49. The term_____refers to an organization of components that define and regulate the collection, storage, management and use of data within a database environment.

a. structured data b. transaction

c. management system d. database system

ANSWER: d

PTS:	1	DIF:	Difficulty: Moderate	REF:	p.22
NAT:	BUSPROG: Analytic	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Comprehension	TOP:	Database Systems		

50. _____relates to the activities that make the database execute transactions more efficiently in terms of storage and access speed.

a. Performance tuning b. Database design

c. Query access d. Database management

ANSWER: a

PTS:	1	DIF:	Difficulty: Moderate	REF:	p.25
NAT:	BUSPROG: Analytic	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Comprehension	TOP:	Database Systems		

51. _____refer to a type of database that stores most of its data in RAM rather than in hard disks.

a. Integrated databases b. Cloud databases

c. Desktop databases d. In-memory databases

ANSWER: d

PTS:	1	DIF:	Difficulty: Easy	REF:	p.30
NAT:	BUSPROG: Technology	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Knowledge	TOP:	Preparing for Your Database Professional Career		

52. _____is the result of processing raw data to reveal its meaning.

ANSWER: Information

PTS:	1	DIF:	Difficulty: Easy	REF:	p.4
NAT:	BUSPROG: Technology	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Knowledge	TOP:	Data versus Information		

53. To reveal meaning, information requires_____.

ANSWER: context

PTS:	1	DIF:	Difficulty: Easy	REF:	p.4
NAT:	BUSPROG: Technology	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Knowledge	TOP:	Data versus Information		

54. Raw data must be properly_____for storage, processing and presentation.

ANSWER: formatted

PTS:	1	DIF:	Difficulty: Easy	REF:	p.4
NAT:	BUSPROG: Technology	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Knowledge	TOP:	Data versus Information		

55. Information is produced by processing_____

ANSWER: data
PTS: 1 DIF: Difficulty: Easy REF: p.4
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Data versus Information

56. _____is data about data through which the end-user data are integrated and managed.

ANSWER: Metadata
PTS: 1 DIF: Difficulty: Easy REF: p.6
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

57. A(n)_____is a collection of programs that manages the database structure and controls access to the data stored in the database.

ANSWER: DBMS (database management system)
database management system (DBMS)
database management system
DBMS
PTS: 1 DIF: Difficulty: Easy REF: p.6
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

58. A(n)_____is a spur-of-the-moment question.

ANSWER: ad hoc query
PTS: 1 DIF: Difficulty: Moderate REF: p.7
NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
KEY: Bloom's: Comprehension TOP: Introducing the Database

59. A(n)_____is a specific request issued to the DBMS for data manipulation.

ANSWER: query
PTS: 1 DIF: Difficulty: Easy REF: p.7
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

60. _____databases focus primarily on storing data used to generate information required to make tactical or strategic decisions.

ANSWER: Analytical
PTS: 1 DIF: Difficulty: Easy REF: p.9
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

61. _____is a special language used to represent and manipulate data elements in a textual format.

ANSWER: XML (Extensible Markup Language)
Extensible Markup Language (XML)
Extensible Markup Language
XML

PTS: 1 DIF: Difficulty: Easy REF: p.10
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Introducing the Database

62. _____exists when it is possible to make changes in the data storage characteristics without affecting an application program's ability to access data.

ANSWER: Data independence
PTS: 1 DIF: Difficulty: Moderate REF: p.19
NAT: BUSPROG: Analytic STATE: DISC: Information Technologies
KEY: Bloom's: Comprehension TOP: Problem with File System Data Processing

63. The term_____refers to scattered locations storing the same basic data.

ANSWER: islands of information
PTS: 1 DIF: Difficulty: Easy REF: p.20
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Problems with File System Data Processing

64. _____exists when the same data are stored unnecessarily at different places.

ANSWER: Data redundancy
PTS: 1 DIF: Difficulty: Easy REF: p.20
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Problems with File System Data Processing

65. _____exists when different and conflicting versions of the same data appear in different places.

ANSWER: Data inconsistency
PTS: 1 DIF: Difficulty: Easy REF: p.20
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Problems with File System Data Processing

66. A(n)_____develops when all required changes in the redundant data are not made successfully.

ANSWER: data anomaly
anomaly
PTS: 1 DIF: Difficulty: Easy REF: p.21
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Problems with File System Data Processing

67. The DBMS uses the _____to look up the required data component structures and relationships, thus relieving programmers from having to code such complex relationships in each program.

ANSWER: data dictionary
PTS: 1 DIF: Difficulty: Easy REF: p.25
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: Database Systems

68. _____relates to activities that make a database operate more efficiently in terms of storage and access speed.

ANSWER: Performance tuning

PTS:	1	DIF:	Difficulty: Easy	REF:	p.25
NAT:	BUSPROG: Technology	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Knowledge	TOP:	Database Systems		

69. Describe what metadata are and what value they provide to the database system.

ANSWER: The metadata describe the data characteristics and the set of relationships that links the data found within the database. For example, the metadata component stores information such as the name of each data element, the type of values (numeric, dates, or text) stored on each data element, and whether the data element can be left empty. The metadata provide information that complements and expands the value and use of the data. In short, metadata present a more complete picture of the data in the database. Given the characteristics of metadata, you might hear a database described as a "collection of self-describing data."

PTS:	1	DIF:	Difficulty: Moderate	REF:	p.6
NAT:	BUSPROG: Analytic	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Comprehension	TOP:	Introducing the Database		

70. What are the advantages of having the DBMS between the end user's applications and the database?

ANSWER: Having a DBMS between the end user's applications and the database offers some important advantages. First, the DBMS enables the data in the database to be shared among multiple applications or users. Second, the DBMS integrates the many different users' views of the data into a single all- encompassing data repository.

PTS:	1	DIF:	Difficulty: Moderate	REF:	p.6
NAT:	BUSPROG: Analytic	STATE:	DISC: Information Technologies		
KEY:	Bloom's: Comprehension	TOP:	Introducing the Database		

71. Discuss some considerations when designing a database.

ANSWER: Proper database design requires the designer to identify precisely the database's expected use. Designing a transactional database emphasizes accurate and consistent data and operational speed. Designing a data warehouse database emphasizes the use of historical and aggregated data. Designing a database to be used in a centralized, single-user environment requires a different approach from that used in the design of a distributed, multiuser database.

Designing appropriate data repositories of integrated information using the two-dimensional table structures found in most databases is a process of decomposition. The integrated data must be decomposed properly into its constituent parts, with each part stored in its own table. Further, the relationships between these tables must be carefully considered and implemented so the integrated view of the data can be re-created later as information for the end user. A well-designed database facilitates data management and generates accurate and valuable information. A poorly designed database is likely to become a breeding ground for difficult-to-trace errors that may lead to bad decision making—and bad decision making can lead to the failure of an organization. Database design is simply too important to be left to luck. That's why college students study database design, why organizations of all types and sizes send personnel to database design seminars, and why database design consultants often make an excellent living.

PTS:	1	DIF:	Difficulty: Moderate	REF:	p.14
NAT:	BUSPROG: Analytic	STATE:	DISC: Information Technology		
KEY:	Bloom's Comprehension	TOP:	Why Database Design is Important		

72. What are some reasons for studying file systems?

ANSWER: A brief explanation of the evolution of file system data processing can be helpful in understanding the data access limitations that databases attempt to overcome. Understanding these limitations is relevant to database designers and developers because database technologies do not make these problems magically disappear—database technologies simply make it easier to create solutions that avoid these problems.

Creating database designs that avoid the pitfalls of earlier systems requires that the designer understand these problems and how to avoid them; otherwise, the database technologies are no better (and are potentially even worse!) than the technologies and techniques they have replaced.

PTS:	1	DIF:	Difficulty: Moderate	REF:	p.14
NAT:	BUSPROG: Analytic	STATE:	DISC: Information Technology		
KEY:	Bloom's Comprehension	TOP:	Why Database Design is Important		

73. What are the problems associated with file systems? How do they challenge the types of information that can be created from the data as well as the accuracy of the information?

ANSWER: The following problems associated with file systems, whether created by DP specialists or through a series of spreadsheets, severely challenge the types of information that can be created from the data as well as the accuracy of the information:

- *Lengthy development times.* The first and most glaring problem with the file system approach is that even the simplest data-retrieval task requires extensive programming. With the older file systems, programmers had to specify what must be done and how to do it.
- *Difficulty of getting quick answers.* The need to write programs to produce even the simplest reports makes ad hoc queries impossible. Harried DP specialists who worked with mature file systems often received numerous requests for new reports. They were often forced to say that the report will be ready “next week” or even “next month.” If you need the information now, getting it next week or next month will not serve your information needs.
- *Complex system administration.* System administration becomes more difficult as the number of files in the system expands. Even a simple file system with a few files requires creating and maintaining several file management programs. Each file must have its own file management programs that allow the user to add, modify, and delete records; to list the file contents; and to generate reports. Because ad hoc queries are not possible, the file reporting programs can multiply quickly. The problem is compounded by the fact that each department in the organization “owns” its data by creating its own files.
- *Lack of security and limited data sharing.* Another fault of a file system data repository is a lack of security and limited data sharing. Data sharing and security are closely related. Sharing data among multiple geographically dispersed users introduces a lot of security risks. In terms of spreadsheet data, while many spreadsheet programs provide rudimentary security options, they are not always used, and even when they are, they are insufficient for robust data sharing among users. In terms of creating data management and reporting programs, security and data-sharing features are difficult to program and consequently are

often omitted from a file system environment. Such features include effective password protection, the ability to lock out parts of files or parts of the system itself, and other measures designed to safeguard data confidentiality. Even when an attempt is made to improve system and data security, the security devices tend to be limited in scope and effectiveness.

- *Extensive programming.* Making changes to an existing file structure can be difficult in a file system environment.

PTS:	1	DIF:	Difficulty: Moderate	REF:	p.18-19
NAT:	BUSPROG: Analytic	STATE:	DISC: Information Technology		
KEY:	Bloom's Comprehension	TOP:	Problem with File System Data Processing		

74. Describe the five types of users identified in a database system.

ANSWER:

1. System administrators oversee the database system's general operations.
2. Database administrators, also known as DBAs, manage the DBMS and ensure that the database is functioning properly.
3. Database designers design the database structure. They are, in effect, the database architects. If the database design is poor, even the best application programmers and the most dedicated DBAs cannot produce a useful database environment. Because organizations strive to optimize their data resources, the database designer's job description has expanded to cover new dimensions and growing responsibilities.
4. System analysts and programmers design and implement the application programs. They design and create the data-entry screens, reports, and procedures through which end users access and manipulate the database's data.
5. End users are the people who use the application programs to run the organization's daily operations. For example, sales clerks, supervisors, managers, and directors are all classified as end users. High-level end users employ the information obtained from the database to make tactical and strategic business decisions.

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75. What are the disadvantages of database systems?

ANSWER: Although the database system yields considerable advantages over previous data management approaches, database systems do carry significant disadvantages:

- *Increased costs*. Database systems require sophisticated hardware and software and highly skilled personnel. The cost of maintaining the hardware, software, and personnel required to operate and manage a database system can be substantial. Training, licensing, and regulation compliance costs are often overlooked when database systems are implemented.

- *Management complexity*. Database systems interface with many different technologies and have a significant impact on a company's resources and culture. The changes introduced by the adoption of a database system must be properly managed to ensure that they help advance the company's objectives. Because database systems hold crucial company data that are accessed from multiple sources, security issues must be assessed constantly.
- *Maintaining currency*. To maximize the efficiency of the database system, you must keep your system current. Therefore, you must perform frequent updates and apply the latest patches and security measures to all components. Because database technology advances rapidly, personnel training costs tend to be significant.
- *Vendor dependence*. Given the heavy investment in technology and personnel training, companies might be reluctant to change database vendors. As a consequence, vendors are less likely to offer pricing point advantages to existing customers, and those customers might be limited in their choice of database system components.
- *Frequent upgrade/replacement cycles*. DBMS vendors frequently upgrade their products by adding new functionality. Such new features often come bundled in new upgrade versions of the software. Some of these versions require hardware upgrades. Not only do the upgrades themselves cost money, it also costs money to train database users and administrators to properly use and manage the new features.

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76. Discuss any three functions performed by the DBMS that guarantee the integrity and consistency of the data in the database.

ANSWER: (answers may vary)

- *Data dictionary management*. The DBMS stores definitions of the data elements and their relationships (metadata) in a data dictionary. In turn, all programs that access the data in the database work through the DBMS. The DBMS uses the data dictionary to look up the required data component structures and relationships, thus relieving you from having to code such complex relationships in each program. Additionally, any changes made in a database structure are automatically recorded in the data dictionary, thereby freeing you from having to modify all of the programs that access the changed structure. In other words, the DBMS provides data abstraction, and it removes structural and data dependence from the system.
- *Data storage management*. The DBMS creates and manages the complex structures required for data storage, thus relieving you from the difficult task of defining and programming the physical data characteristics. A modern DBMS provides storage not only for the data but for related data-entry forms or screen definitions, report definitions, data validation rules, procedural code, structures to handle video and picture formats, and so on. Data storage management is also important for database performance tuning. Performance tuning relates to the activities that make the database perform more efficiently in terms of storage and access speed. Although the user sees the database as a single data storage unit, the DBMS actually stores the database in multiple physical data files. Such data files may even be stored on different storage media. Therefore, the DBMS doesn't have to wait for one disk

request to finish before the next one starts. In other words, the DBMS can fulfill database requests concurrently.

- *Data transformation and presentation*. The DBMS transforms entered data to conform to required data structures. The DBMS relieves you of the chore of distinguishing between the logical data format and the physical data format. That is, the DBMS formats the physically retrieved data to make it conform to the user's logical expectations.
- *Security management*. The DBMS creates a security system that enforces user security and data privacy. Security rules determine which users can access the database, which data items each user can access, and which data operations (read, add, delete, or modify) the user can perform. This is especially important in multiuser database systems.

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