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Solution Manual:

CHAPTER 2: DATA MODELS

1. A data model is usually graphical.
   a. True
   b. False

   ANSWER: True

PTS: 1	DIF: Difficulty: Easy	REF: p.36
NAT: BUSPROG: Technology	STATE: DISC: Information Technologies	
KEY: Bloom's: Knowledge	TOP: Data Modeling and Data Models	

2. An implementation-ready data model needn't necessarily contain enforceable rules to guarantee the integrity of the data.
   a. True
   b. False

   ANSWER: False

PTS: 1	DIF: Difficulty: Moderate	REF: p.36
NAT: BUSPROG: Analytic	STATE: DISC: Information Technologies	
KEY: Bloom's: Comprehension	TOP: Data Modeling and Data Models	

3. An implementation-ready data model should contain a description of the data structure that will store the end-user data.
   a. True
   b. False

   ANSWER: True

PTS: 1	DIF: Difficulty: Easy	REF: p.36
NAT: BUSPROG: Technology	STATE: DISC: Information Technologies	
KEY: Bloom's: Knowledge	TOP: Data Modeling and Data Models	

4. Within the database environment, a data model represents data structures with the purpose of supporting a specific problem domain.
   a. True

b. False

ANSWER: True

PTS: 1	DIF:	Difficulty: Easy	REF: p.36
NAT: BUSPROG: Technology	STATE:	DISC: Information Technologies	
KEY: Bloom's: Knowledge	TOP:	Data Modeling and Data Models	

5. Even when a good database blueprint is available, an applications programmer's view of the data should match that of the manager and the end user.

a. True

b. False

ANSWER: False

PTS: 1	DIF:	Difficulty: Moderate	REF: p.37
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Chapter 2: Data Models

6. In the context of data models, an entity is a person, place, thing, or event about which data will be collected and stored.
   a. True
   b. False

   ANSWER: True
   PTS: 1   DIF: Difficulty: Easy   REF: p.37-38
   NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge   TOP: Data Model Basic Building Blocks

7. Database designers determine the data and information that yield the required understanding of the entire business.
   a. True
   b. False

   ANSWER: False
   PTS: 1   DIF: Difficulty: Easy   REF: p.39
   NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge   TOP: Business Rules

8. Business rules apply to businesses and government groups, but not to other types of organizations such as religious groups or research laboratories.
   a. True
   b. False

   ANSWER: False
   PTS: 1   DIF: Difficulty: Moderate   REF: p.39
   NAT: BUSPROG: Analytic   STATE: DISC: Information Technologies
   KEY: Bloom's: Comprehension   TOP: Business Rules

9. Business rules must be rendered in writing.
   a. True
   b. False

   ANSWER: True
   PTS: 1   DIF: Difficulty: Easy   REF: p.39
   NAT: BUSPROG: Communication   STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge   TOP: Business Rules

10. A disadvantage of the relational database management system (RDBMS) is its inability to hide the complexities of the relational model from the user.
    a. True
    b. False

    ANSWER: False.
    PTS: 1   DIF: Difficulty: Moderate   REF: p.43
    NAT: BUSPROG: Analytic   STATE: DISC: Information Technologies
    KEY: Bloom's: Comprehension   TOP: The Evolution of Data Models

11. In an SQL-based relational database, each table is dependent on every other table.
    a. True
    b. False

ANSWER: False
PTS: 1 DIF: Difficulty: Easy REF: p.45
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: The Evolution of Data Models

12. In an SQL-based relational database, rows in different tables are related based on common values in common attributes.
   a. True
   b. False

ANSWER: True
PTS: 1 DIF: Difficulty: Easy REF: p.45
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: The Evolution of Data Models

13. Each row in the relational table is known as an entity instance or entity occurrence in the ER model.
   a. True
   b. False

ANSWER: True
PTS: 1 DIF: Difficulty: Easy REF: p.46
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: The Evolution of Data Models

14. M:N relationships are not appropriate in a relational model.
   a. True
   b. False

ANSWER: True
PTS: 1 DIF: Difficulty: Easy REF: p.47
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: The Evolution of Data Models

15. In Chen notation, entities and relationships have to be oriented horizontally; not vertically.
   a. True
   b. False

ANSWER: False
PTS: 1 DIF: Difficulty: Easy REF: p.47
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: The Evolution of Data Models

16. Today, most relational database products can be classified as object/relational.
   a. True
   b. False

ANSWER: True
PTS: 1 DIF: Difficulty: Easy REF: p.50
NAT: BUSPROG: Technology STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge TOP: The Evolution of Data Models

17. The network model has structural level dependence.
    a. True
    b. False

    ANSWER: True
    PTS: 1   DIF: Difficulty: Easy   REF: p.56
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

18. The external model is the representation of the database as "seen" by the DBMS.
    a. True
    b. False

    ANSWER: False
    PTS: 1   DIF: Difficulty: Easy   REF: p.60
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: Degrees of Data Abstraction

19. The hierarchical model is software-independent.
    a. True
    b. False

    ANSWER: False
    PTS: 1   DIF: Difficulty: Easy   REF: p.62
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: Degrees of Data Abstraction

20. The relational model is hardware-dependent and software-independent.
    a. True
    b. False

    ANSWER: False
    PTS: 1   DIF: Difficulty: Easy   REF: p.62
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: Degrees of Data Abstraction

21. A(n)_____'s main function is to help one understand the complexities of the real-world environment.
    a. node   b. entity
    c. model   d. database

    ANSWER: c
    PTS: 1   DIF: Difficulty: Easy   REF: p.36
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

22. A(n)_____is anything about which data are to be collected and stored.
    a. attribute   b. entity
    c. relationship   d. constraint

ANSWER: b
PTS: 1   DIF: Difficulty: Easy   REF: p.37
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
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23. A(n) ___ represents a particular type of object in the real world.

a. attribute   b. entity

c. relationship   d. node

ANSWER: b
PTS: 1   DIF: Difficulty: Easy   REF: p.38
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

24. A(n) ___ is the equivalent of a field in a file system.

a. attribute   b. entity

c. relationship   d. constraint

ANSWER: a
PTS: 1   DIF: Difficulty: Easy   REF: p.38
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

25. A(n) ___ is bidirectional.

a. attribute   b. entity

c. relationship   d. constraint

ANSWER: c
PTS: 1   DIF: Difficulty: Easy   REF: p.38
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

26. A(n) ___ is a restriction placed on the data.

a. attribute   b. entity

c. relationship   d. constraint

ANSWER: d
PTS: 1   DIF: Difficulty: Easy   REF: p.38
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

27. ___ are important because they help to ensure data integrity.
a. Attributes   b. Entities

c. Relationships   d. Constraints

ANSWER: d
PTS: 1   DIF: Difficulty: Easy   REF: p.38
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

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28. _____are normally expressed in the form of rules.

   a. Attributes   b. Entities

   c. Relationships   d. Constraints

   ANSWER: d
   PTS: 1   DIF: Difficulty: Easy   REF: p.38
   NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

29. Students and classes have a _____relationship.

   a. one-to-one   b. one-to-many

   c. many-to-one   d. many-to-many

   ANSWER: d
   PTS: 1   DIF: Difficulty: Easy   REF: p.38
   NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

30. From a database point of view, the collection of data becomes meaningful only when it reflects properly defined_____.

   a. business rules

   b. business norms

   c. business goals

   d. business plans

   ANSWER: a
   PTS: 1   DIF: Difficulty: Moderate   REF: p.39
   NAT: BUSPROG: Analytic   STATE: DISC: Information Technologies
   KEY: Bloom's: Comprehension   TOP: Business Rules

31. Which of the following is true of business rules?

   a. They allow the designer to set company policies with regard to data.

   b. They allow the designer to develop business processes.

   c. They can serve as a communication tool between the users and designers.

   d. They provide a framework for the company's self-actualization.

   ANSWER: c
   PTS: 1   DIF: Difficulty: Moderate   REF: p.40
   NAT: BUSPROG: Analytic   STATE: DISC: Information Technologies
   KEY: Bloom's: Comprehension   TOP: Business Rules

32. A noun in a business rule translates to a(n)_____in the data model.

   a. entity   b. attribute

   c. relationship   d. constraint

   ANSWER: a
   PTS: 1   DIF: Difficulty: Easy   REF: p.40
   NAT: BUSPROG: Communication STATE: DISC: Information Technologies
   KEY: Bloom's: Knowledge   TOP: Business Rules

33. A verb associating two nouns in a business rule translates to a(n)_____in the data model.

    a. entity   b. attribute

    c. relationship   d. constraint

    ANSWER: c
    PTS: 1   DIF: Difficulty: Easy   REF: p.40
    NAT: BUSPROG: Communication STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: Business Rules

34. In the__   model, the basic logical structure is represented as an upside-down tree.

    a. hierarchical   b. network

    c. relational   d. entity relationship

    ANSWER: a
    PTS: 1   DIF: Difficulty: Easy   REF: p.41
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

35. In the__   model, each parent can have many children, but each child has only one parent.

    a. hierarchical   b. network

    c. relational   d. entity relationship

    ANSWER: a
    PTS: 1   DIF: Difficulty: Easy   REF: p.41
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

36. The hierarchical data model was developed in the _____.

    a. 1960s   b. 1970s

    c. 1980s   d. 1990s

    ANSWER: a
    PTS: 1   DIF: Difficulty: Easy   REF: p.41
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

37. In the_   model, the user perceives the database as a collection of records in 1:M relationships, where each record can have more than one parent.

    a. hierarchical   b. network

    c. object-oriented   d. entity relationship

    ANSWER: b
    PTS: 1   DIF: Difficulty: Easy   REF: p.41-42
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

38. The object-oriented data model was developed in the_____

    a. 1960s   b. 1970s

    c. 1980s   d. 1990s

ANSWER: c
PTS: 1   DIF: Difficulty: Easy   REF: p.42
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39. VMS/VSAM is an example of the ___ .

a. hierarchical model   b. file system data model

c. relational data model   d. XML data model

ANSWER: b
PTS: 1   DIF: Difficulty: Easy   REF: p.42
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40. Oracle 11g is an example of the ___ .

a. hierarchical model   b. file system data model

c. relational data model   d. XML/Hybrid data model

ANSWER: d
PTS: 1   DIF: Difficulty: Easy   REF: p.42
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
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41. MySQL is an example of the ___ .

a. hierarchical model   b. file system data model

c. relational data model   d. XML data model

ANSWER: c
PTS: 1   DIF: Difficulty: Easy   REF: p.42
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models
Relationship.

42. A(n) ___ enables a database administrator to describe schema components.

a. extensible markup language (XML) b. data definition language (DDL)

c. unified modeling language (UML)   d. query language

ANSWER: b
PTS: 1   DIF: Difficulty: Easy   REF: p.42
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

43. The relational data model was developed in the _____ .

a. 1960s   b. 1970s

c. 1980s   d. 1990s

ANSWER: b
PTS: 1   DIF: Difficulty: Easy   REF: p.43
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KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

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44. The＿＿ model was developed to allow designers to use a graphical tool to examine structures rather than describing them with text.

a. hierarchical   b. network

c. object-oriented   d. entity relationship

ANSWER: d

PTS: 1	DIF: Difficulty: Easy	REF: p.45
NAT: BUSPROG: Technology	STATE: DISC: Information Technologies	
KEY: Bloom's: Knowledge	TOP: The Evolution of Data Models	

45. A(n)＿ enables a database administrator to describe schema components.

a. extensible markup language (XML)b. data definition language (DDL)

c. unified modeling language (UML)   d. query language

ANSWER: b

PTS: 1	DIF: Difficulty: Easy	REF: p.45
NAT: BUSPROG: Technology	STATE: DISC: Information Technologies	
KEY: Bloom's: Knowledge	TOP: The Evolution of Data Models	

46. The＿＿ model uses the term connectivity to label the relationship types.

a. relational   b. network

c. object-oriented   d. entity relationship

ANSWER: d

PTS: 1	DIF: Difficulty: Easy	REF: p.46
NAT: BUSPROG: Technology	STATE: DISC: Information Technologies	
KEY: Bloom's: Knowledge	TOP: The Evolution of Data Models	

47. The＿＿ data model is said to be a semantic data model.

a. relational   b. network

c. object-oriented   d. entity relationship

ANSWER: c

PTS: 1	DIF: Difficulty: Easy	REF: p.48
NAT: BUSPROG: Technology	STATE: DISC: Information Technologies	
KEY: Bloom's: Knowledge	TOP: The Evolution of Data Models	

48. The＿＿ data model uses the concept of inheritance.

a. relational   b. network

c. object-oriented   d. entity relationship

ANSWER: c

PTS: 1	DIF: Difficulty: Easy	REF: p.50
NAT: BUSPROG: Technology	STATE: DISC: Information Technologies	
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49. Which of the following types of HDFS nodes stores all the metadata about a file system?

a. Data node   b. Client node

c. Name node   d. Map node

ANSWER: c
PTS: 1   DIF: Difficulty: Easy   REF: p.52
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

50. Which of the following is true of NoSQL databases?

a. They do not support distributed database architectures.   b. They are not based on the relational model.

c. They are geared toward transaction consistency rather than performance.   d. They do not support very large amounts of sparse data.

ANSWER: b
PTS: 1   DIF: Difficulty: Easy   REF: p.53
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

51. Which of the following types of HDFS nodes acts as the interface between the user application and the HDFS?

a. Data node   b. Client node

c. Name node   d. Map node

ANSWER: b
PTS: 1   DIF: Difficulty: Easy   REF: p.53
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

52. NoSQL databases:

a. are geared toward transaction consistency; not performance.   b. support only small amounts of sparse data.

c. are based on the relational model.   d. provide fault tolerance.

ANSWER: d
PTS: 1   DIF: Difficulty: Easy   REF: p.55
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

53. Which of the following is a disadvantage of the hierarchical data model?

a. It does not promote data sharing.   b. It is not efficient with 1:M relationships.

c. It does not promote data integrity.   d. It does not have standards.

ANSWER: d
PTS: 1   DIF: Difficulty: Easy   REF: p.58
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

54. One of the limitations of the_____model is that there is a lack of standards.

a. hierarchical   b. network

c. relational   d. entity relationship

ANSWER: a
PTS: 1   DIF: Difficulty: Easy   REF: p.58
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

55. The model is the end users' view of the data environment.
    a. abstract   b. external

    c. conceptuald. internal

    ANSWER: b
    PTS: 1   DIF: Difficulty: Easy   REF: p.60
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

56. An internal _____ refers to a specific representation of an internal model, using the database constructs
    supported by the chosen database.
    a. tuple   b. schema
    c. object   d. value

    ANSWER: b
    PTS: 1   DIF: Difficulty: Easy   REF: p.62
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: Degrees of Data Abstraction

57. A(n) __ is a relatively simple representation of more complex real-world data structures.

    ANSWER: data model
    PTS: 1   DIF: Difficulty: Easy   REF: p.36
    NAT: BUSPROG: Communication STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: Data Modeling and Data Models

58. A(n) __ is a brief, precise, and unambiguous description of a policy, procedure, or principle within a
    specific organization.

    ANSWER: business rule
    PTS: 1   DIF: Difficulty: Easy   REF: p.39
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: Business Rules

59. A(n) __ in a hierarchical model is the equivalent of a record in a file system.

    ANSWER: segment
    PTS: 1   DIF: Difficulty: Easy   REF: p.41
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
    KEY: Bloom's: Knowledge   TOP: The Evolution of Data Models

60. A(n) __ is the conceptual organization of an entire database as viewed by a database administrator.

    ANSWER: schema
    PTS: 1   DIF: Difficulty: Easy   REF: p.42
    NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
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61. A(n)_____defines the environment in which data can be managed and is used to work with the data in the database.

ANSWER: data manipulation language (DML)
PTS: 1   DIF: Difficulty: Easy   REF: p.42
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
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62. The relational model's foundation is a mathematical concept known as a_____.

ANSWER: relation
PTS: 1   DIF: Difficulty: Easy   REF: p.43
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
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63. Each row in a relation is called a(n)_____.

ANSWER: tuple
PTS: 1   DIF: Difficulty: Easy   REF: p.43
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
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64. 64. Each column in a relation represents a(n)_____.

ANSWER: attribute
PTS: 1   DIF: Difficulty: Easy   REF: p.43
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
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65. Each row in the relational table is known as a(n)_____.

ANSWER: entity instance
PTS: 1   DIF: Difficulty: Easy   REF: p.46
NAT: BUSPROG: Technology   STATE: DISC: Information Technologies
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66. In, a three•pronged symbol represents the "many" side of the relationship.

ANSWER: Crow's Foot notation
PTS: 1   DIF: Difficulty: Easy   REF: p.46
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67. A(n)_____is a collection of similar objects with a shared structure and behavior.

ANSWER: class
PTS: 1   DIF: Difficulty: Easy   REF: p.48
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68. In object-oriented terms, a(n)_____defines an object's behavior.

ANSWER: method
PTS: 1   DIF: Difficulty: Easy   REF: p.48
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69. _____is a language based on OO concepts that describes a set of diagrams and symbols used to graphically model a system.

ANSWER: UML (Unified Modeling Language)
           Unified Modeling Language (UML)
           Unified Modeling Language
           UML
PTS: 1   DIF: Difficulty: Easy   REF: p.48
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70. The term_____is used to refer to the task of creating a conceptual data model that could be implemented in any DBMS.

ANSWER: logical design
PTS: 1   DIF: Difficulty: Easy   REF: p.62
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71. The._____.is the representation of a database as "seen" by the DBMS.

ANSWER: internal model
PTS: 1   DIF: Difficulty: Easy   REF: p.62
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72. What components should an implementation-ready data model contain?

ANSWER: An implementation-ready data model should contain at least the following components:
           A description of the data structure that will store the end-user data.
           A set of enforceable rules to guarantee the integrity of the data.
           A data manipulation methodology to support the real-world data transformations.

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73. What do business rules require to be effective?

ANSWER: To be effective, business rules must be easy to understand and widely disseminated to ensure that every person in the organization shares a common interpretation of the rules. Business rules describe, in simple language, the main and distinguishing characteristics of the data as viewed by the company.
PTS: 1   DIF: Difficulty: Moderate   REF: p.39
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KEY: Bloom's: Comprehension   TOP: Business Rules

74. What are the sources of business rules, and what is the database designer's role with regard to business rules?

ANSWER: The main sources of business rules are company managers, policy makers, department managers, and written documentation such as a company's procedures, standards, and operations manuals. A faster and more direct source of business rules is direct interviews with end users. Unfortunately, because perceptions differ, end users are sometimes a less reliable source when it comes to specifying business rules. For example, a maintenance department mechanic might believe that any mechanic can initiate a maintenance procedure, when actually only mechanics with inspection authorization can perform such a task. Such a distinction might seem trivial, but it can have major legal consequences. Although end users are crucial contributors to the development of business rules, it pays to verify end-user perceptions. Too often, interviews with several people who perform the same job yield very different perceptions of what the job components are. While such a discovery may point to "management problems," that general diagnosis does not help the database designer. The database designer's job is to reconcile such differences and verify the results of the reconciliation to ensure that the business rules are appropriate and accurate.

PTS: 1   DIF: Difficulty: Moderate   REF: p.39-40
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75. Describe the three parts involved in any SQL-based relational database application.

ANSWER: From an end-user perspective, any SQL-based relational database application involves three parts: a user interface, a set of tables stored in the database, and the SQL "engine." Each of these parts is explained below.

1. The end-user interface. Basically, the interface allows the end user to interact with the data (by automatically generating SQL code). Each interface is a product of the software vendor's idea of meaningful interaction with the data. You can also design your own customized interface with the help of application generators that are now standard fare in the database software arena.

2. A collection of tables stored in the database. In a relational database, all data are perceived to be stored in tables. The tables simply "present" the data to the end user in a way that is easy to understand. Each table is independent. Rows in different tables are related by common values in common attributes.

3. SQL engine. Largely hidden from the end user, the SQL engine executes all queries, or data requests. Keep in mind that the SQL engine is part of the DBMS software. The end user uses SQL to create table structures and to perform data access and table maintenance. The SQL engine processes all user requests—largely behind the scenes and without the end user's knowledge. Hence, SQL is said to be a declarative language that tells what must be done but not how.

PTS: 1   DIF: Difficulty: Moderate   REF: p.45
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76. Describe the conceptual model and its advantages. What is the most widely used conceptual model?

ANSWER: The conceptual model represents a global view of the entire database by the entire organization. That is, the conceptual model integrates all external views (entities, relationships, constraints, and processes) into a single global view of the data in the enterprise. Also known as a conceptual schema, it is the basis for the identification and high-level description of the main data objects (avoiding any database model- specific details).

The most widely used conceptual model is the ER model. Remember that the ER model is illustrated with the help of the ERD, which is effectively the basic database blueprint. The ERD is used to graphically represent the conceptual schema.

The conceptual model yields some important advantages. First, it provides a bird's-eye (macro level) view of the data environment that is relatively easy to understand.

Second, the conceptual model is independent of both software and hardware. Software independence means that the model does not depend on the DBMS software used to implement the model. Hardware independence means that the model does not depend on the hardware used in the implementation of the model. Therefore, changes in either the hardware or the DBMS software will have no effect on the database design at the conceptual level. Generally, the term logical design refers to the task of creating a conceptual data model that could be implemented in any DBMS.

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