

...ing a DBMS and discussed some situations in which it may not be advan-
tageous to use one.

Review Questions

- 1.1. Define the following terms: *data, database, DBMS, database system, data-base catalog, program-data independence, user view, DBA, end user, canned transaction, deductive database system, persistent object, meta-data, and transaction-processing application.*
- 1.2. What four main types of actions involve databases? Briefly discuss each.
- 1.3. Discuss the main characteristics of the database approach and how it differs from traditional file systems.
- 1.4. What are the responsibilities of the DBA and the database designers?
- 1.5. What are the different types of database end users? Discuss the main activities of each.
- 1.6. Discuss the capabilities that should be provided by a DBMS.
- 1.7. Discuss the differences between database systems and information retrieval systems.

Finally, we classified DBMSs according to several criteria: data model, number of users, number of sites, types of access paths, and cost. We discussed the availability of DBMSs and additional modules—from no cost in the form of open source software to configurations that annually cost millions to maintain. We also pointed out the variety of licensing arrangements for DBMS and related products. The main classification of DBMSs is based on the data model. We briefly discussed the main data models used in current commercial DBMSs.

Review Questions

- 2.1. Define the following terms: *data model*, *database schema*, *database state*, *internal schema*, *conceptual schema*, *external schema*, *data independence*, *DDL*, *DML*, *SDL*, *VDL*, *query language*, *host language*, *data sublanguage*, *database utility*, *catalog*, *client/server architecture*, *three-tier architecture*, and *n-tier architecture*.
- 2.2. Discuss the main categories of data models. What are the basic differences among the relational model, the object model, and the XML model?
- 2.3. What is the difference between a database schema and a database state?
- 2.4. Describe the three-schema architecture. Why do we need mappings among schema levels? How do different schema definition languages support this architecture?
- 2.5. What is the difference between logical data independence and physical data independence? Which one is harder to achieve? Why?
- 2.6. What is the difference between procedural and nonprocedural DMLs?
- 2.7. Discuss the different types of user-friendly interfaces and the types of users who typically use each.
- 2.8. With what other computer system software does a DBMS interact?
- 2.9. What is the difference between the two-tier and three-tier client/server architectures?
- 2.10. Discuss some types of database utilities and tools and their functions.
- 2.11. What is the additional functionality incorporated in *n*-tier architecture ($n > 3$)?

research the Internet on databases design process and select the three main design tool components:

1. ERD
2. UML
3. ORM

put together a word document defining each tool, and provide the advantage or disadvantage (differences) between tools.

provide examples on each tool .

deliverables: within your word document screen capture the examples.