1 Chapter 13
Databases and Information Management

2 Chapter 13 Objectives

3 Data and Information

1 **How are data and information related?**

2
- **Computers process data into information**
- **Data is raw facts; information is data that is organized and meaningful**

4 Data and Information

1 **What is a database?**

2
- **Collection of data organized so you can access, retrieve, and use it**
- **Database software allows you to**
  - **Create database**
  - **Add, change, and delete data**
  - **Sort and query database**
- **Database software also is called database management system (DBMS)**

5 Data and Information

1 **What is data integrity?**

2
- **Degree to which data is correct**
- **When database contains errors, it loses integrity**

6 The Hierarchy of Data

1 **What is a field?**

2
- **Combination of one or more characters**
- **Smallest unit of data user accesses**
- **Field name uniquely identifies each field**

7 The Hierarchy of Data

1 **What are characteristics of a field?**

2
- **Data type**
- **Field size**

8 The Hierarchy of Data

1 **What is a record?**

2
- **Group of related fields**

9 The Hierarchy of Data

1 **What is a data file?**

2
- **Collection of related records stored on disk**
- **Each record in file contains same fields**
- **Each field contains different data**
- **Also called a file**
- **Database usually composed of group of related data files**

10 Maintaining Data

1 **What is file maintenance?**

2 ❖ **Procedure that keeps data current**

11 Maintaining Data

1 **What is validation?**

2 ❖ **Validity check analyzes entered data to help ensure it is correct**

12 Maintaining Data

1 **What is a completeness check?**

2 ❖ **Error message displays stating which required fields are blank**

13 Maintaining Data

1 **What is a check digit?**

2 ❖ **Number(s) or character(s) appended to or inserted into primary key value**

❖ **Used to confirm accuracy of primary key value**

14 File Processing Versus Databases

1 **What is a file processing system?**

2 ❖ **Each department or area within organization has own set of files**

❖ **Records in one file often do not relate to records in any other file**

15 File Processing Versus Databases

1 **What is the database approach?**

2 ❖ **Many programs and users can share data in database**

❖ **Secures data so only authorized users can access certain data items**

16 File Processing Versus Databases

What are the strengths of the database approach?

17 File Processing Versus Databases

How do a database application and a file processing application differ in the way they might store data?

18 Database Management Systems

1 **What is a database management system (DBMS)?**

2 ❖ **Software that allows you to create, access, and manage a database**

19 Database Management Systems

1 **What is a data dictionary?**

2 ❖ **Contains data about each file in database and each field within those files**

20 Database Management Systems

1 **What is a query language?**

2 ❖ **Simple, English-like statements that allow you to specify data to display, print, or store**

21 Database Management Systems

1 **What is a query by example (QBE)?**

2 ❖ **Program retrieves records that match criteria entered in form fields**

22 Database Management Systems

1 **What is a form?**

2 ❖ **Window on screen that provides areas for entering or changing data in database**

❖ **E-form is similar, but used on Web**

23 Database Management Systems

1 **What is a report generator?**

2 ❖ **Generates report without user's knowledge of programming**

❖ **Comes with a database**

24 Database Management Systems

1 **What is data security?**

2 ❖ **DBMS**
provides means
to ensure
only authorized users can access data with specified privileges

25 Database Management Systems

1 **What is a log?**

2 ❖ **Listing of activities that change database contents**

❖ **For every change, DBMS places three items in log file**

26 Database Management Systems

1 **What is a recovery utility?**

2 ❖ **Uses log file and/or backups to restore database when it is damaged or destroyed**

27 Relational, Object-Oriented and Multidimensional Databases

1 **What is a data model?**

2 ❖ **Every database and DBMS based on specific data model**

❖ **Composed of rules and standards**

28 Relational, Object-Oriented, and Multidimensional Databases

1 **What is a relational database?**

2 ❖ **Stores data in tables that consist of rows and columns**

- **Each row has primary key**
- **Each column has a unique name**

29 Relational, Object-Oriented, and Multidimensional Databases

1 **What is normalization?**

2 ❖ **Process designed to ensure data within relations (tables) contains least amount of duplication**

30 Relational, Object-Oriented, and Multidimensional Databases

1 **What is relational algebra?**

2 ❖ **Uses variables and operations to build new relations**
❖ **Used to manipulate and retrieve data**

31 Relational, Object-Oriented, and Multidimensional Databases

1 **What is an example of a projection operation?**

2 ❖ **Extracts data from column (field)**

32 Relational, Object-Oriented, and Multidimensional Databases

1 **What is an example of a selection operation?**

2 ❖ **Extracts data from a row (record)**

33 Relational, Object-Oriented, and Multidimensional Databases

1 **What is an example of a combined projection and selection operation?**

2 ❖ **Extracts data from column (field) for certain rows (records)**

34 Relational, Object-Oriented, and Multidimensional Databases

1 **What is an example of a join operation?**

2 ❖ **Combines data from two or more tables using a common column**

35 Relational, Object-Oriented, and Multidimensional Databases

1 **What is Structured Query Language (SQL)?**

2 ❖ **Allows you to manage, update, and retrieve data**
❖ **Uses relational algebra**
❖ **Has special keywords and rules included in SQL statements**

36 Relational, Object-Oriented, and Multidimensional Databases

1 **What is an object-oriented database (OODB)?**

2 ❖ **Stores data in objects**
❖ **Advantages**
- **Can store more types of data**
- **Can access data faster**

37 Relational, Object-Oriented, and Multidimensional Databases

What are examples of applications appropriate for an object-oriented database?

38 Relational, Object-Oriented, and Multidimensional Databases

1 **What is a multidimensional database (MDDB)?**

2 ❖ **Stores data in dimensions**

39 Database Administration

What is the role of the database analyst and administrator?

40 Database Administration

1 **What is the role of the employee as a user?**

2 ❖ **Employee should learn how to utilize data in database**
❖ **Take part in designing database that will help achieve company's overall goals**

41 Database Administration

What are guidelines for developing a database?

42 Qualities of Valuable Information

What are the qualities of valuable information?

43 Qualities of Valuable Information

How do managers use information?

44 Qualities of Valuable Information

What are the levels of users?

45 Types of Information Systems

1 **What is an information system?**

2
- **Set of hardware, software, data, people, and procedures that work together to produce information**

46 Types of Information Systems

What are the five categories of information systems?

47 Types of Information Systems

1 **What is a management information system (MIS)?**

2
- **Generates accurate, timely, and organized information**
- **Managers and other users can**
  - **Make decisions**
  - **Solve problems**
  - **Supervise activities**
  - **Track progress**
- **Often integrated with transaction processing systems**

48 Types of Information Systems

1 **What is a detailed report?**

2
- **Lists one record per line**

49 Types of Information Systems

1 **What is a summary report?**

2
- **Consolidates data, so you can review it quickly and easily**
- **Usually has totals, tables, or graphs**

50 Types of Information Systems

1 **What is an exception report?**

2
- **Identifies data outside of normal condition**
- **Conditions, called exception criteria, define normal activity or status range**

51 Types of Information Systems

1 **What is a decision support system (DSS)?**

2
- **Helps managers analyze data and make decisions**
- **One type of DSS is executive information system (EIS)**

52 Types of Information Systems

1 **What is a data warehouse?**

2 - **Huge database system that stores and manages data required to analyze historical and current transactions**

53 Types of Information Systems

What are terms associated with a data warehouse?

54 Types of Information Systems

1 **What is an expert system?**

2 - **Captures and stores knowledge of human experts**

55 Types of Information Systems

1 **What is an integrated information system?**

2 - **Five information systems combined in some way**

56 Summary of Databases and Information Management

- **Data and information**
- **The hierarchy of data**
- **Maintaining data**
- **File processing versus databases**
- **Database management systems**
- **Relational, object-oriented, and multidimensional databases**
- **Database administration**
- **Qualities of valuable information**
- **Types of information systems**