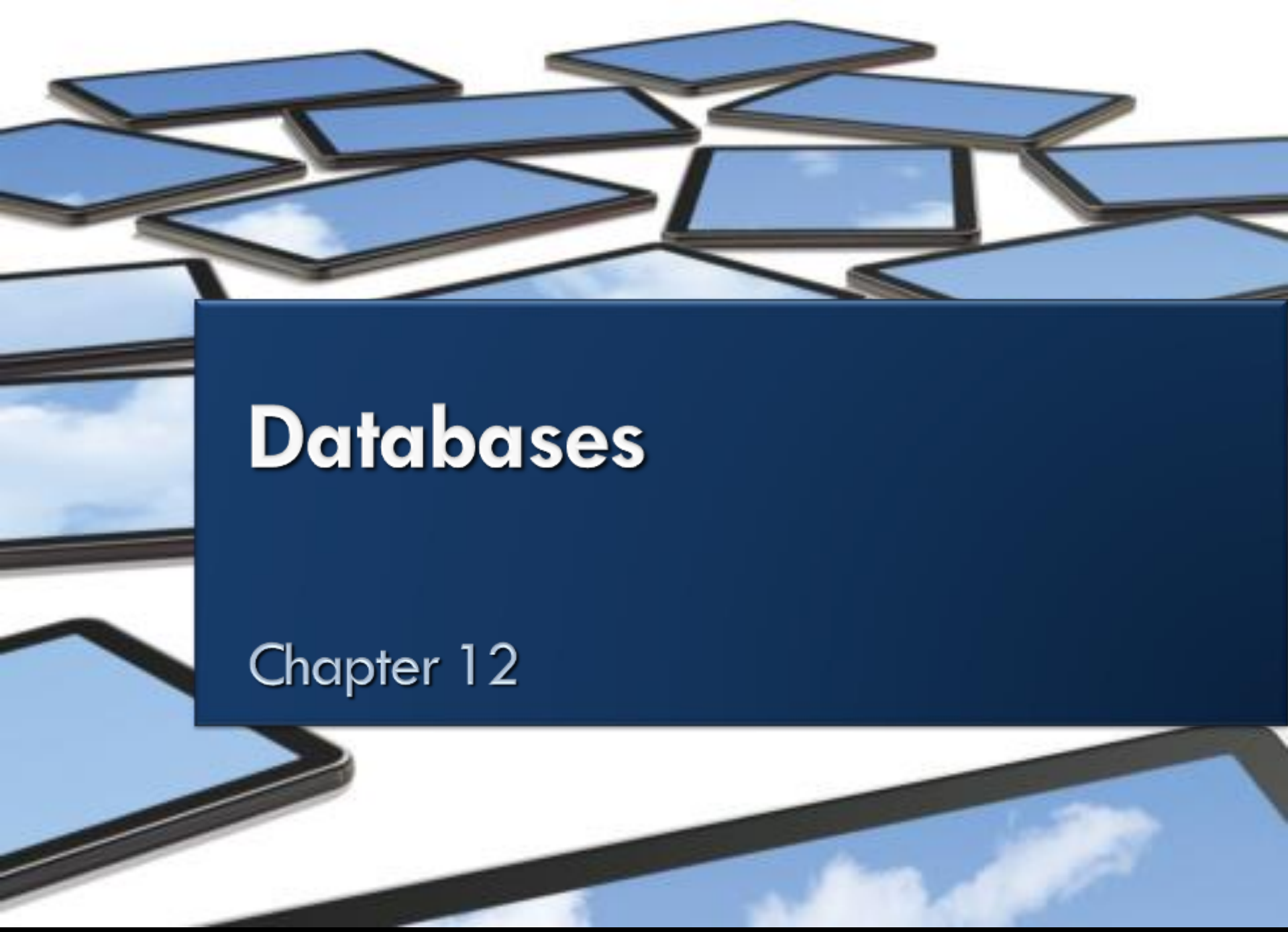


Databases

Chapter 12

Competencies (Page 1 of 2)

- Distinguish between the physical and logical views of data.
- Describe how data is organized: characters, fields, records, tables, and databases.
- Define key fields and how they are used to integrate data in a database.
- Define and compare batch processing and real-time processing.

Competencies (Page 2 of 2)

- Describe the five common database models: hierarchical, network, relational, multidimensional, and object-oriented.
- Distinguish among individual, company, distributed, and commercial databases.
- Discuss strategic database uses and security concerns.

Introduction

- Like a library, secondary storage is designed to store information
- End users need to understand
  - How information is organized in fields, records, tables and databases
  - The different types of databases and structures

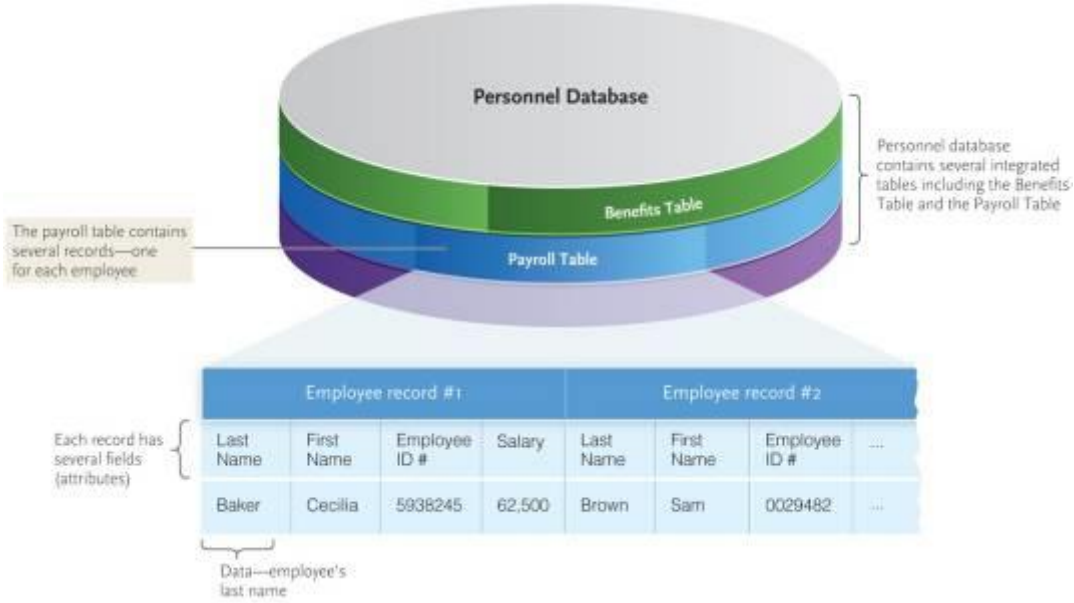
- Competent end users need to be able to find information that is stored in databases

Data

- Examples of data include
  - Facts or observations about people, places, things, and events
  - Audio, music, photographs, and video
- Two ways to view data
  - Physical view
  - Logical view

Data Organization

- Character
- Field
- Record
- Table
- Database

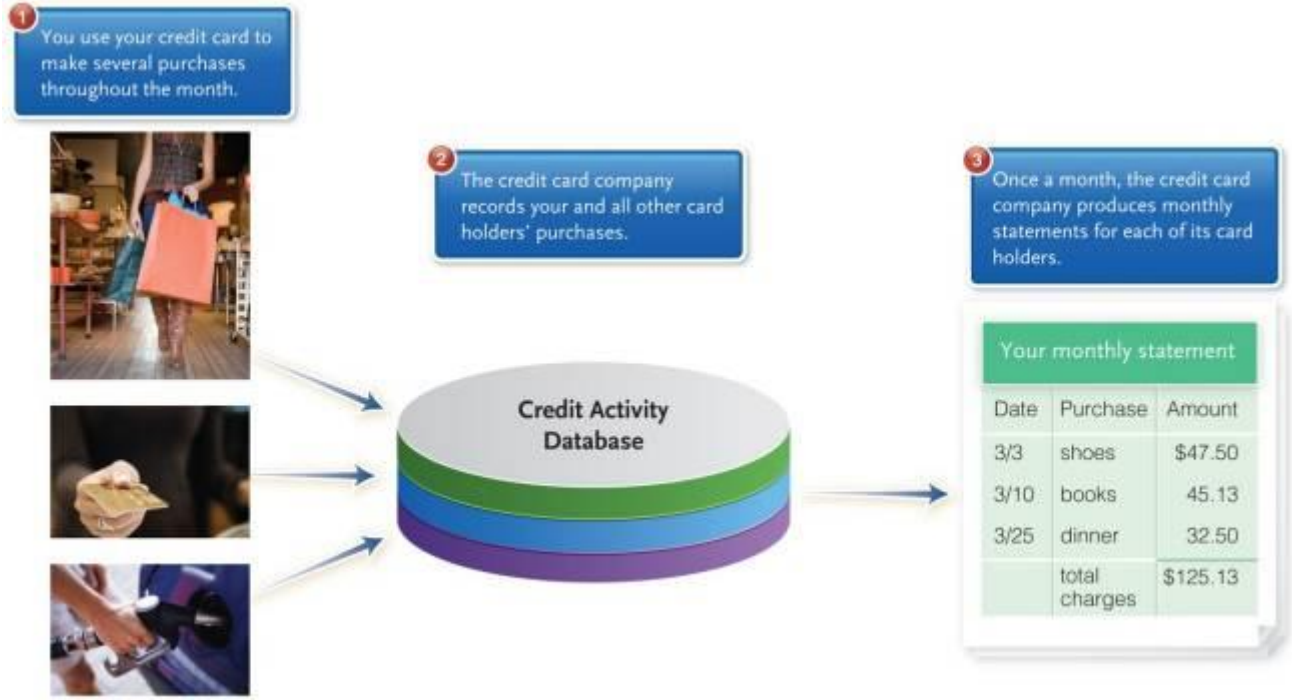


Key Field

- Unique identifier also known as primary key
- Common examples
  - Social Security Number
  - Student Identification Numbers
  - Employee Identification Numbers
  - Part Numbers
  - Inventory Numbers

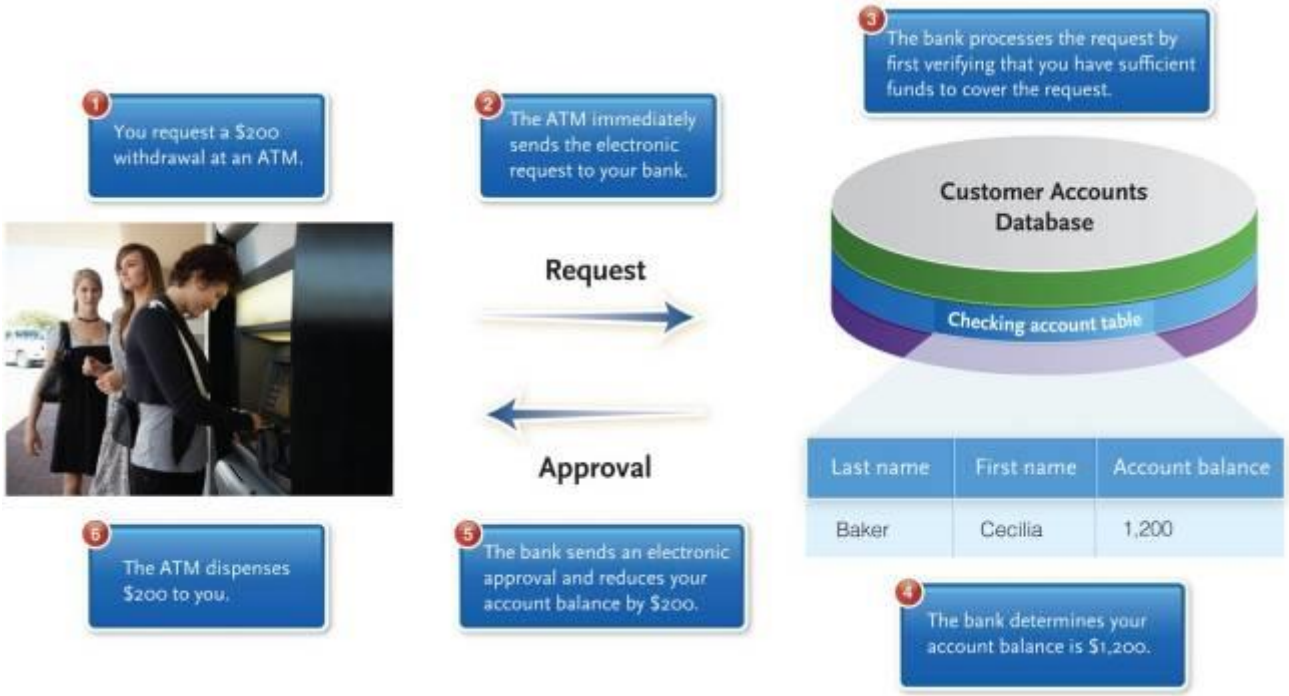
Batch Processing

- Batch processing
  - Data is collected over a period of time and the processing happens later all at one time



Real-Time Processing

- Real-time processing
  - Also known as online processing because it happens immediately during the transaction

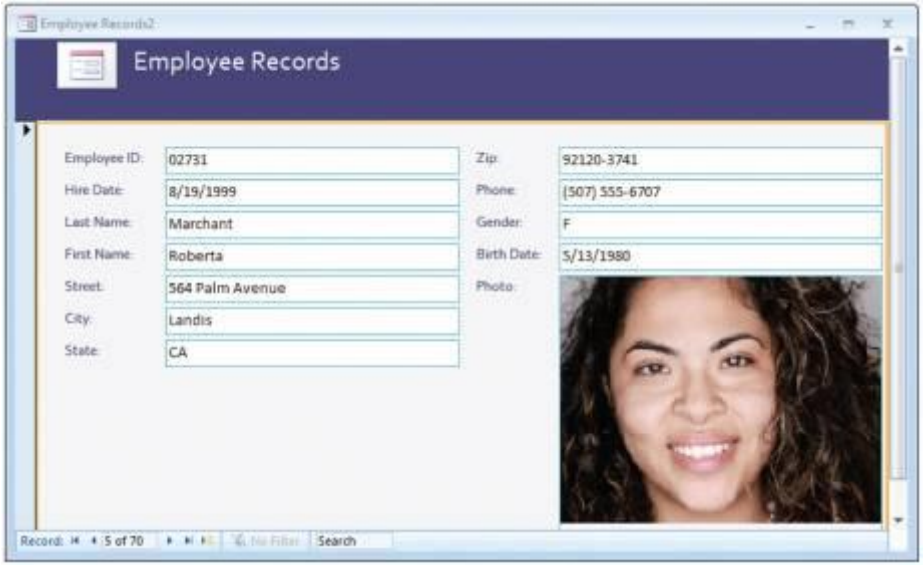


Databases

- Collection of integrated data
  - Logically related files and records
- Databases address data redundancy and data integrity

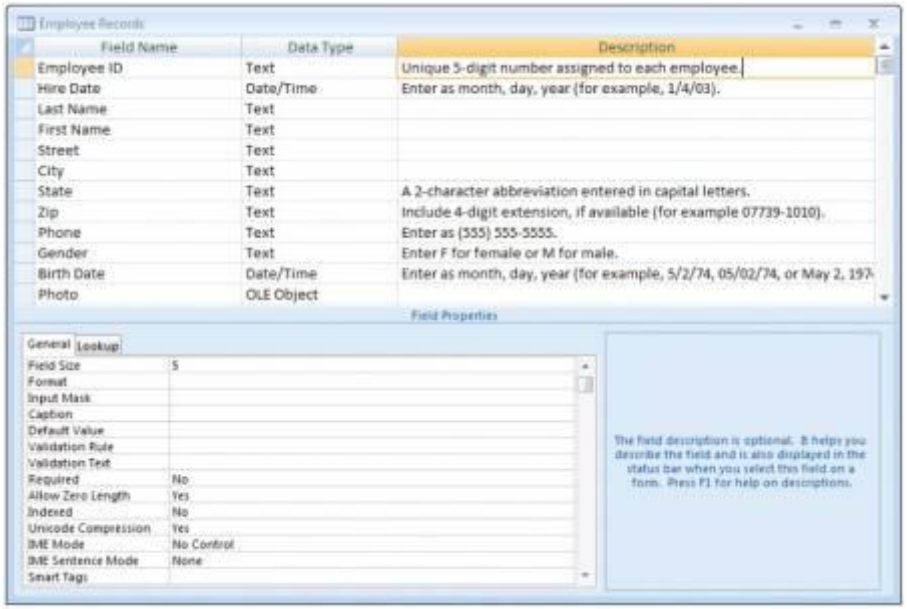
Need for Databases

- Sharing
- Security
- Less data redundancy
- Data integrity



Database Management (Page 1 of 2)

- DBMS engine
- Data definition subsystem
  - Data dictionary / schema



Database Management (Page 2 of 2)

- Data manipulation subsystem
  - Query-by-example
  - Structured query language (SQL)
- Application generation subsystem
- Data administration subsystem
  - Database Administrators (DBAs)
  - Processing rights

DBMS Structure

- Database model
  - DBMS programs work with data that is logically structured or arranged
  - Model defined rules and standards for data in a database
- Five common data models
  - Hierarchical database
  - Network database
  - Relational database
  - Multidimensional database
  - Object-oriented database

Types of Databases

- Individual
- Company or shared
- Distributed
- Commercial

Type	Description
Individual	Integrated files used by just one person
Company	Common operational or commonly used files shared in an organization
Distributed	Database spread geographically and accessed using database server
Commercial	Information utilities or data banks available to users on a wide range of topics

Database Uses and Issues

- Strategic uses
  - Special type of database called data warehouse
  - Data mining is used to search databases for information and patterns
- Security
  - Databases are valuable
  - Protection necessary

Security: electronic fingerprint scanner

Careers In IT

- Database administrators
  - Determine the most efficient ways to organize and access a company's data
  - Responsible for database security and backing up the system
- Employers look for
  - Bachelors degree in Computer Science
  - Technical experience
- Database administrators can expect to earn $48,500 to $85,000 annually

A Look to the Future

- Every Book Ever Written … at Your Fingertips
  - Massive amounts of digital storage are now available and affordable
  - Google Book Search contains millions of book

Open-Ended Questions (Page 1 of 2)

- Describe the five logical data groups or categories.
- What is the difference between batch processing and real-time processing?
- Identify and define the five parts of DBMS programs.

Open-Ended Questions (Page 2 of 2)

- Describe each of the five common database models.
- What are some of the benefits and limitations of databases? Why is security a concern?