Database Management System 1

Introduction to Database System

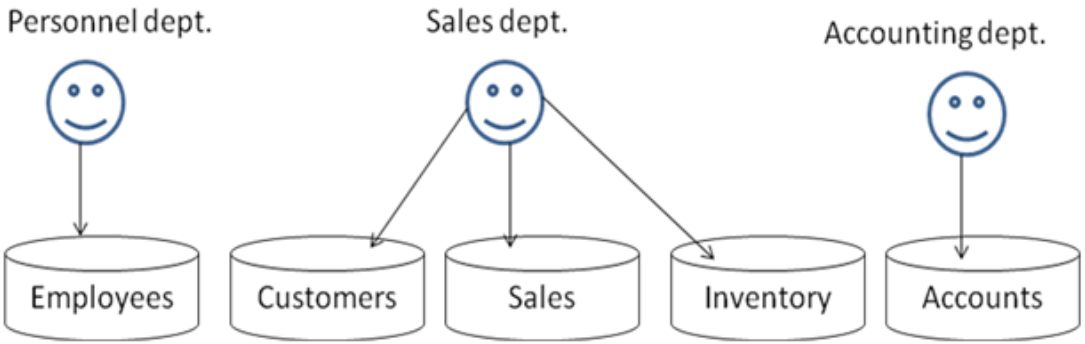
Chittaranjan Pradhan
School of Computer Engineering,
KIIT University

Data & Information

- ***Data***
  - Raw facts, unprocessed facts
  - Refers to what is actually stored
- ***Information***
  - Result of processing raw data
  - Refers to meaning of the data, understood by the user

Data management focuses on the generation, storage & retrieval of data

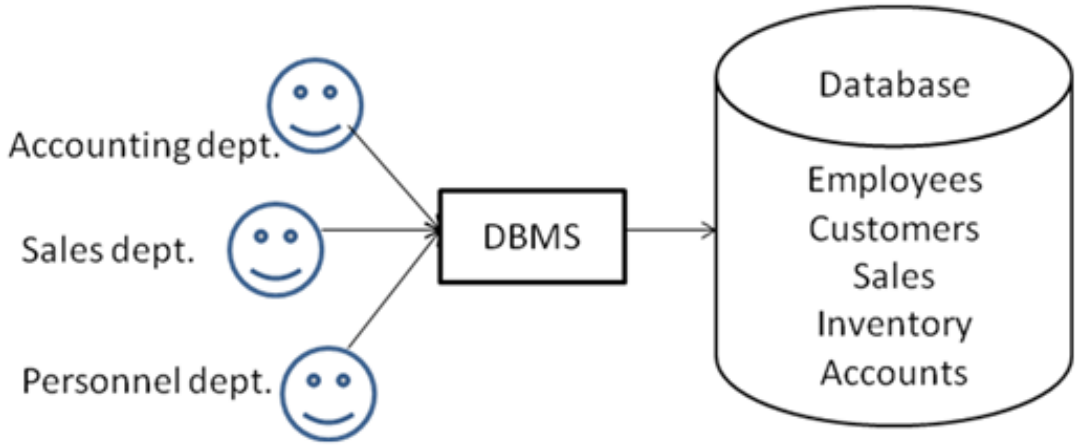
Limitations of File-Processing Systems



- Redundancy problem
  - Repetitive data
- Data-inconsistency problem
  - Incorrectness of data
- Lack of data integration
  - Complex and time consuming

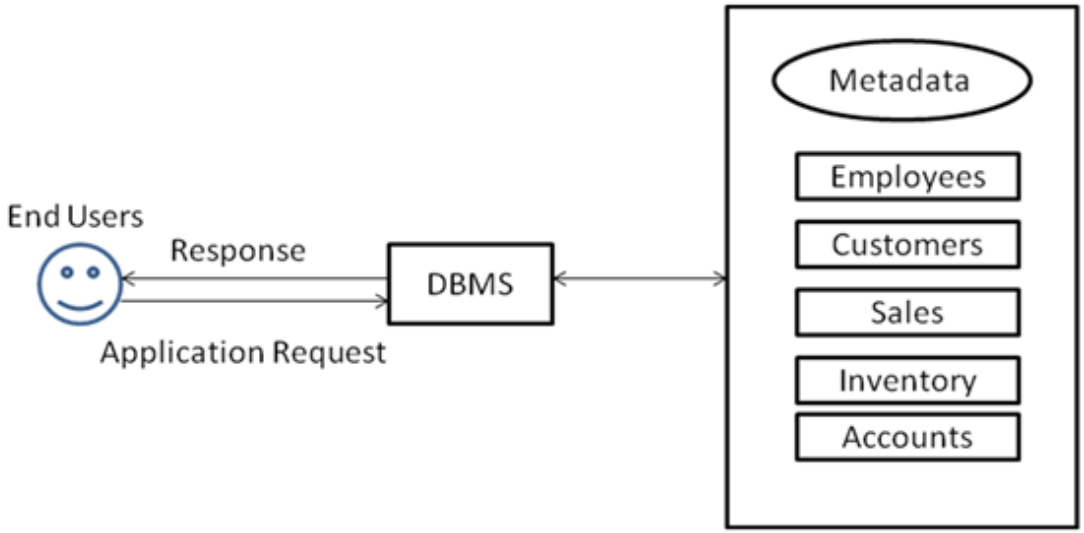
Database

- Database is a collection of interrelated data
- Database is a shared, integrated computer structure that stores:
  - **End- user data**: raw facts of interest to the end-user
  - **Meta data**: through which the end-user data are integrated & managed. The metadata provides a description of the data characteristics and the set of relationships that link the data found within the database
- Database is an organized collection of data of an organization or enterprise



DBMS

- DBMS (Database Management System) is a collection of programs that manages structure & controls access to the data stored in the database
- It includes tools to add, modify or delete data from the database, ask questions (or queries) about the data stored in the database and produce reports
- DBMS serves as the intermediary between the user & the database



Database Types

- Depending on the number of users accessing the database, a database system may be classified as:
  - **Single-user database system**: It supports only one user at a time. When a single-user database runs on a personal computer, it is also called a desktop database system
  - **Multi-user database system**: It supports multiple users at the same time. When a multi-user database supports relatively small number of users, it is called as a workgroup database system. If the database is used by many users across globe, it is known as enterprise database system
- Depending on the location of the database, a database system may be classified as:
  - **Centralized database system**: It supports data located at a single site or single place
  - **Distributed database system**: It supports data distributed across several different sites. Here, the same database can be replicated and stored in another computer so that when ever the original server goes down; the data can be available to the user from the replicated data from other servers

Advantages of DBMS over File System

- Controlling Redundancy & Inconsistency
- Allows Data Sharing
- Restricting Unauthorized Access
- Providing Storage Structures for efficient query processing
- Providing Backup & Recovery
- Providing multiple user interfaces
- Enforcing Integrity Constraints
- Solving data isolation
- Providing economies of scaling