

## Chapter 5 Data Resource Management

### 1. What is Database?

**Ans:**

A database is an integrated collection of logically related data elements. A database consolidates records previously stored in separate files into a common pool of data elements that provides data for many applications. The data stored in a database are independent of the application programs using them and of the type of storage devices on which they are stored.

### 2. Discuss Logical data elements in information system.

**Ans:**

A conceptual framework of several levels of data has been devised that differentiates among different groupings, or elements, of data. Thus, data may be logically organized into *characters, fields, records, files, and databases*

The most basic logical data element is the **character**, which consists of a single alphabetic, numeric, or other symbol.

The next higher level of data is the **field**, or data item. A field consists of a grouping of related characters. For example, the grouping of alphabetic characters in a person's name may form a name field (or typically, last name, first name, and middle initial fields),

All of the fields used to describe the attributes of an entity are grouped to form a **record**. Thus, a record represents a collection of *attributes* that describe a single instance of an *entity*.

A group of related records is a data **file**. When it is independent of any other files related to it, a single *table* may be referred to as *Flat file*

A **database** is an integrated collection of logically related data elements. A database Consolidates records previously stored in separate files into a common pool of data elements that provides data for many applications.

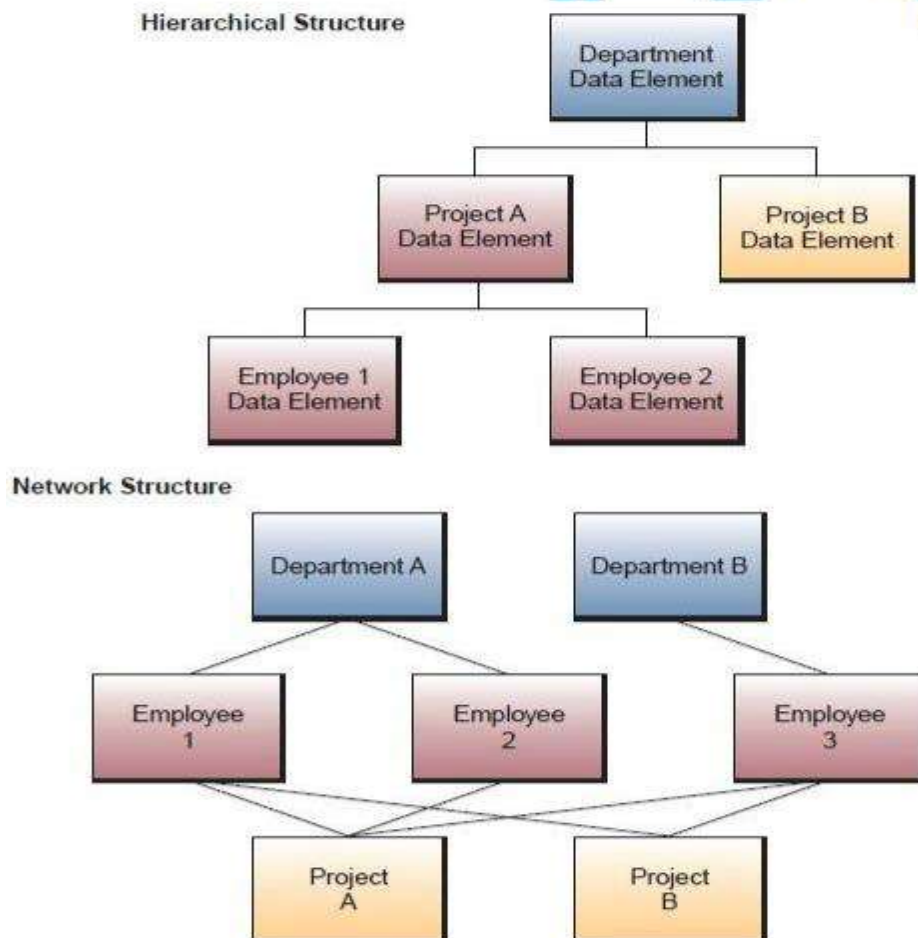
### 3. Explain different types of Database structures.

**Ans:**

The relationships among the many individual data elements stored in databases are based on one of several logical data structures, or models. Five fundamental **database structures** are the *hierarchical, network, relational, object-oriented, and multidimensional* models.

DBMS packages used the **hierarchical structure**, in which the relationships between records form a hierarchy or treelike structure. In the traditional hierarchical model, all records are dependent and arranged in multilevel structures, consisting of one *root* record and any number of subordinate levels.

The **network structure** can represent more complex logical relationships and is still used by some mainframe DBMS packages. It allows *many-to-many* relationships among records; that is, the network model can access a data element by following one of several paths because any data element or record can be related to any number of other data elements.



## Relational Structure

Department Table

Deptno	Dname	Dloc	Dmgr
Dept A			
Dept B			
Dept C			

Employee Table

Empno	Ename	Etitle	Esalary	Deptno
Emp 1				Dept A
Emp 2				Dept A
Emp 3				Dept B
Emp 4				Dept B
Emp 5				Dept C
Emp 6				Dept B

The **relational model** is the most widely used of the three database structures. It is used by most microcomputer DBMS packages, as well as by most midrange and mainframe systems.

The **multidimensional model** is a variation of the relational model that uses multidimensional structures to organize data and express the relationships between data.

The **object-oriented model** is considered one of the key technologies of a new generation of multimedia Web-based applications. an **object** consists of data values describing the attributes of an entity, plus the operations that can be performed upon the data.

#### 4. What is Database Management System (DBMS)

**Ans:**

A **database management system (DBMS)** is the main software tool of the database management approach because it controls the creation, maintenance, and use of the databases of an organization and its end users.

#### 5. What are the Types of DBMS?

**Ans:**

Continuing developments in information technology and its business applications have resulted in the evolution of several major **types of databases**.

**Operational databases** store detailed data needed to support the business processes and operations of a company. They are also called subject area databases (SADB), transaction database, and production **databases** like SQL Server, Oracle **Database**, Sybase, Informix, and MySQL

Distributed databases can reside on network servers on the World Wide Web, on corporate intranets or extranets, or on other company networks. Oracle Help Center

Access to a wealth of information from **external databases** is available for a fee from commercial online services and with or without charge from many sources on the World Wide Web, The type of **database**, "MYSQL" or "POSTGRESQL."

A Web site stores such information in a **hypermedia database** consisting of hyperlinked pages of multimedia (text, graphic and photographic images, video clips, audio segments, and so on).

## 6. Advantages and Disadvantages of DBMS.

**Ans:**

- **Advantages:**

- Controlling Redundancy
- Integrity can be enforced
- Inconsistency can be avoided
- Data can be shared
- Standards can be enforced
- Restricting unauthorized access
- Solving Enterprise Requirement than Individual Requirement
- Providing Backup and Recovery
- Cost of developing and maintaining system is lower
- Data Model can be developed
- Concurrency Control

### **Disadvantages:**

#### **Data Redundancy**

Independent data files included a lot of duplicated data; the same data (such as a customer's name and address) were recorded and stored in several files. This data redundancy caused problems when data had to be updated.

#### **Lack of Data Integration**

Having data in independent files made it difficult to provide end users with information for ad hoc requests that required accessing data stored in several different files.

#### **Data Dependency**

In file processing systems, major components of a system—the organization of files, their physical locations on storage hardware, and the application software used to access those files.

#### **Lack of Data Integrity or Standardization**

In file processing systems, it was easy for data elements such as stock numbers and customer addresses to be defined differently by different end users and applications.

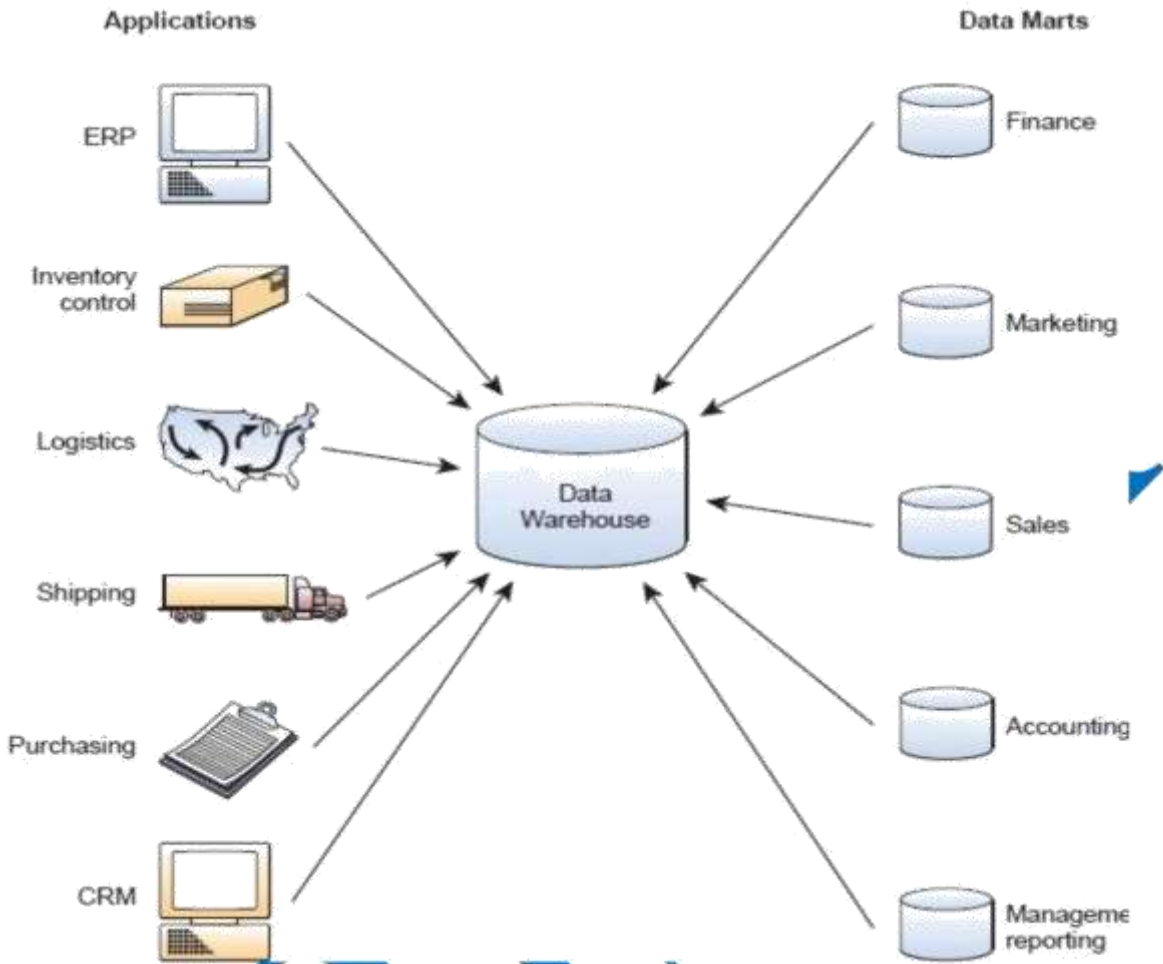
## 7. Explain Database warehouse and Data Mining.

**Ans:**

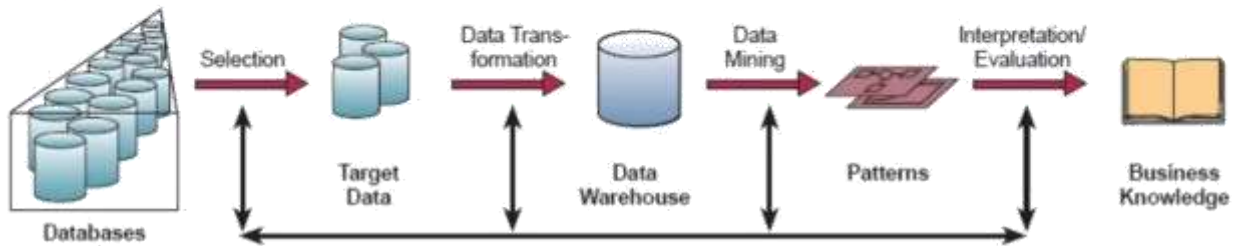
A data warehouse stores data that have been extracted from the various operational, external, and other databases of an organization. It is a central source of the data that have been cleaned, transformed, and cataloged so that they can be used by managers and other business professionals for data mining, online analytical processing, and other forms of business analysis, market research, and decision support.

Data warehouses may be subdivided into **data marts**, which hold subsets of data from the warehouse that focus on specific aspects of a company, such as a department or a business process.





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**Data mining**

Data mining is a major use of data warehouse databases and the static data they contain. In data mining, the data in a data warehouse are analyzed to reveal hidden patterns and trends in historical business activity. This analysis can be used to help managers make decisions about strategic changes in business operations to gain competitive advantages in the marketplace.