

## UNIT-7

### **Database Management System**

A database management system is a software package with computer programs that controls the creation, maintenance, and use of a database. It allows organizations to conveniently develop databases for various applications.

Example: Oracle, IBM DB2, Microsoft SQL Server, Microsoft Access, PostgreSQL, MySQL, FoxPro, and SQLite.

#### **Data can be organized into two types:**

- **Flat File:** Data is stored in a single table. Usually suitable for less amount of data.
- **Relational:** Data is stored in multiple tables and the tables are linked using a common field. Relational is suitable for medium to large amount of data.

### **Database Servers**

Database servers are dedicated computers that hold the actual databases and run only the DBMS and related software.

### **RDBMS**

A relational database management system (RDBMS) is a database management system that is based on the relational model as introduced by E. F. Codd. In the relational model of a database,

all data is represented in terms of tuples, grouped into relations. A database organized in terms of the relational model is a relational database.

The purpose of the relational model is to provide a declarative method for specifying data and Queries.

Few terms related to RDBMS:

#### **1.)Tables:**

A table is a set of data elements (values) that is organized using a model of vertical columns (which are identified by their name) and horizontal rows.

#### **2.)Columns or Fields:**

A column is a set of data values of a particular simple type, one for each row of the table. For example, cFirstName, or cLastName are fields in a row.

#### **3.)Rows or Records or Tuples:**

A row also called a record or tuple represents a single, data item in a table.

#### **Data types:**

Data types is broadly classified into five categories listed below.

- Numeric Types
- Alphanumeric Types
- Binary Types
- Date time

- Other Variable types

(Refer the definition of each from book)

### Primary key (PK):

*A primary key is a unique value that identifies a row in a table. Example, ClientID.*

### Foreign key (FK):

The foreign key identifies a column or set of columns in one (referencing) table that refers to a column or set of columns in another (referenced) table.

### Manipulating database:

A popular data manipulation language is **Structured Query Language (SQL)**. This is used to retrieve and manipulate data in a relational database. In a database you can define the structure of the data and manipulate the data using some commands. There are two types of languages for this task. These are:

- Data Definition Language (DDL)
- Data Manipulation Language (DML)

### Data Definition Language (DDL)

A data definition language or data description language (DDL) is a standard for commands that define the different structures in a database. DDL statements create, modify, and remove database objects such as tables, indexes, and users. Common DDL statements are CREATE, ALTER, and DROP.

### Data Manipulation Language (DML)

A data manipulation language (DML) is a language that enables users to access and manipulate

data in a database. The goal is to provide efficient human interaction with the system. Data manipulation involves:

- Retrieval of information from the database- SELECT statement
- Insertion of new information into the database - INSERT statement
- Deletion of information in the database - DELETE statement
- Modification of information in the database - UPDATE statement

### There are two types of DML:

- **Procedural:** The user specifies what data is needed and how to get it
- **Nonprocedural:** The user only specifies what data is needed. This is easier for the user but may not generate code as efficient as that produced by procedural languages.

**Form:** A form provides the user a systematic way of storing information into the database. It is an interface

in a user specified layout that lets users to view, enter, and change data directly in database objects such as tables.

**Report:** A report is used to generate the overall work outcome in a clear format.