

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.