

## DBMS

*Database is a collection of data designed to be used by different people. It is a collection of interrelated data stored together, with controlled redundancy to serve one or more applications in an optimal fashion. The data are stored in such a fashion that they are independent of the programs of people using data. A common and controlled approach is used in adding new data and modifying and retrieving the existing within the database*

Database management systems (DBMS) are support programs that work in conjunction with the operating system to create, store, process, retrieve, control and manage the data. The DBMS acts as an interface between the application program and the data in the database

**Sybase, DB2, SQL server etc. an organization may build its own database as per the requirement for the organization.**

### **OBJECTIVES OF DATABASE :**

The objectives which management should keep in mind as they design and organize a database are :

- (a) Provide for mass storage of relevant data.
- (b) Make access to the data easy for the user.
- (c) Provide prompt response to the user requests for data.
- (d) Make the latest modifications to the database immediately.
- (e) Eliminate redundant data.
- (f) Allow multiple users to be active at one time.
- (g) Allow for growth in the database system.
- (h) Protect the data from physical harm and unauthorized access.

## CHARACTERISTICS OF DATA IN A DATABASE

The data in a database should have the following features.

- 1. Shared** - Data in a database are shared among different users and applications.
- 2. Persistence** - Data in a database exist permanently in the sense, the data can live beyond the scope of the process that created it.
- 3. Validity/Integrity/Correctness** - Data should be correct with respect to the real world entity that they represent.
- 4. Security** - Data should be protected from unauthorized access.
- 5. Consistency** - Whenever more than one data element in a database represents related real world values, the values should be consistent with respect to the relationship.
- 6. Non-redundancy** - No two data items in a database should represent the same real-world entity.
- 7. Independence** - The three levels in the schema (internal, conceptual and external) should be independent of each other .

## Components of DBMS

A DBMS has 3 main components

- (a) Data dictionary system (DDS)
- (b) Data definition language (DDL)
- (c) Data manipulation language (DML)

**(a) Data dictionary system (DDS)** : The data dictionary system is an encyclopedia of information concerning each data element. It describes the data and its characteristics, such as location, size and data type. It also identifies the origin, use, ownership and also the methods of data access and data security. When it exists in a file,

special software is necessary to create it, maintain it and make it available for use. Such software is called a data dictionary system. A good data dictionary would ensure consistent definitions of data across different databases. If there were to be a change to the data, it would also identify all the databases affected by the change.

**(b) Data Definition Language (DDL) :** The data definition language is used to create the data, describe the data and define the schema in the DBMS. It serves as an interface for application programs that use the data. Once the data dictionary has been created, its definitions must be entered into the DBMS.

The primary functions of DDL are :

1. Describes the schema and subschemas.
2. Describes the fields in each record and record's logical name.
3. Describe the data type and name of each field.
4. Indicate the keys of the record.
5. Provide for data security restrictions.
6. Provide for logical and physical data independence.
7. Provide means for associating related records or fields.

For example, if a payroll program needs the employment number of an employee, the DDL defines the logical relationship between the employment number and the other data in the database, and acts as an interface between the payroll program and the files that contain the employment numbers.

**(c) Data Manipulation Language (DML) :**

A data manipulation language is a language that processes and manipulates the data in the database. It also allows the user to query the database and receive summary reports and / or customized

reports. DML enables the user to access, update, replace, delete and protect database records from unauthorized access.

The functions of DML are :

1. Provide techniques for data manipulation such as deletion, replacement, retrieval, sorting, or insertion of data or records.
2. Allows user and application programs to process data on logical basis rather than physical location basis.
3. Provide access which is independence of programming languages.
4. Provide for use of record relationships.

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