

Introduction To Database Management System

A database management system (DBMS) is a computer program designed to manage a large amount of structured data, and run operations on the desired data requested by the users. The best example of DBMS is Banking. All the transactions that take place are based on a defined software program which keeps track of all the data.

The core of any database management system is the data itself. Another important aspect regarding DBMS is the difference between data and information.

Data: It is the unorganised facts which need to be compiled to form meaningful information

Information: Once the data is processed and made into a structured context, it is called information.

Let us now move on to the detailed study of what a database management system is and understand its importance and benefits in the field of Computer and Technology.

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What is DBMS and Its Types

A collection of information which is managed such that it can be updated and easily accessed is called a database. A software package which can be used to manipulate, validate and retrieve this database is called a **Database Management System**.

For example, Airlines use this software package to book tickets and confirm reservations which are then managed to keep a track of the schedule.

There are majorly three types of database:

- 1. Network Database:** When the details of multiple members can be linked to the files of multiple owners and vice versa, it is called a network database.
- 2. Hierarchical Database:** When the data stored in the form of records and is connected to each other through links is called hierarchical database. Each record comprises fields and each field comprises only one value.
- 3. Relational Database:** When the data is organised as a set of tables comprising rows and columns with a pre-defined relationship with one another, it is called a relational database.

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Components of Database Management Software

There four main components on which the working of a DBMS depends. This includes:

1. **Data:** The main component is the data. The entire database is set based on the data and the information processed based on it. This data acts as a bridge between the software and hardware components of DBMS. This can further be divided into three varieties:
 - a. **User Data** - The actual data based on which the work is done
 - b. **Metadata** - This is the data of the data, i.e., managing the data required to enter the information
 - c. **Application MetaData** - This is the structure and format of the queries

To simplify it, in a table, the information given in each table is the User Data, the number of tables, rows and columns is the MetaData the structure we choose is the Application MetaData.

2. **Hardware:** These are the general hardware devices which help us save and enter the data like hard disks, magnetic tapes, etc.
3. **Software:** The software acts as a medium of communication between the user and the database. Based on the user's requirement, the database can be modified and updated. To perform operations on the data, query languages like SQL are used.
4. **Users:** No function can be performed without the Users. Thus, they form the fourth most important component of DBMS. The information entered into a database is used by the User or the administrator to perform their business operations and responsibilities.

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Benefits of Using Database Management System

Major Organisations and Banking firms choose to work using the Database Management System. It is because this system program helps the user and the administrator easily manage the data and information on the database.

Given below are a few advantages of using a Database Management System:

- Securing the data is easy. The administrator can restrict the usage of the database to a few people only. Thus, access to the database is restricted only to the administering team of an Organisation or Business which can keep the data safe
- A single file can manage the entire database which is why duplicity and redundancy cannot happen. This makes the data more consistent and easy to update
- Since tables can be created in DBMS, interrelating the data and elements with each other is convenient
- The backup and recovery of data is managed by the software, which ensures that the database is secure at all times
- It allows multi-users to operate the database at a single time, making it more efficient

Important Terms related to Database Management System

A few other important terms related to DBMS have been discussed in brief below. To understand this concept better, one must be aware of the following terms.

- Data Manipulation Languages (DML) - This is a programming language used to insert or modify the data present in a database. These are of two types: SQL and DDL.
- Structured Query Language (SQL) - A programming language generally used for the relational database management system, which comprises tables.
- Data Definition Language (DDL) - It is a syntax which helps in modifying data present in the form of tables or indexes
- Primary Key - Each file has a unique key. Using the Primary Key, a specific file can be identified
- Foreign Key - The relation between a field in one table and component identified by a primary key can be detected using a Foreign Key

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