What is Data, Database and Database Management System (DBMS)?

What is Data?

We all are familiar with **Social** websites like **Facebook & Instagram, E-Commerce** websites like **Amazon & SnapDeal, Banking** websites like **Barclays & HDFC** or any **Education** website like **ToolsQA,** all these websites have a humongous amount of data stored in it. So what is Data?

Data is any sort of information which is stored in computer memory. This information can later be used for a website, an application or any other client to store for future purpose. The most common information is User information in the form of user personal, address and banking information. Let's consider Facebook, it stores our personal data, images, posts, comments and many more things. Banking application also stores user data, their transactions details, funds summary etc. All this information is data, but when it put together and store in a structural way, it becomes informational data.

But, how do these applications or websites get data? When you post a status on Facebook, perform a banking transaction online or upload a selfie on Instagram, you are actually sending **data** to the site or to be precise their server. So, we can say any information transmitted or transferred is actually data. Server filter out the necessary data and stores it in **Database**. Here the concept of Databases come up, let's take a look.

What is Database (DB)?

So what is a Database? Is it a random collection of stuff all squeezed in together? No, **Database (DB)** are organized, they have a structure, and all the data they store it fits into that structure. More specifically, a database is an electronic system that allows data to be **stored**, easily **accessed, manipulated and updated**.

So, we just saw the definition of databases but where in real life can we see such things? Well, we all are well aware of things like a **telephone directory**. Well, **phonebook/telephone directory** actually contains the name of people arranged in order of their last names. So, we are able to store data and search it efficiently using the last name of the person, like it's really easy if I ask you to search for **Tyagi**, **Vishu**. But an issue arrives if I ask you to search for every contact with the first name Martin. The issue here is, names are stored according to last names so searching for the first name is a lot trickier. So, a database is made up of two components mainly, **data** and **a meaningful method for accessing and manipulating data.** Without these two, a database is just a random set of data. A more precise example of a database can be a dictionary, which stores a large quantity of data as Key-Value pairs. At the same time, it also has a meaningful method to access data using the Key.

Databases are quite similar to spreadsheets as they are mostly made up of tables which contain rows and columns like a spreadsheet. A database needs to be hosted or created on some special **database platform**, some of the famous Database platforms are:

- **PostgreSQL**
- **MySQL**

- **Microsoft Access**
- **SQLite**

We know that when we use any software, like an app, data is either added to the database, updated according to the action or pulled as per the action we perform. But, the computer must have something to perform such action too. A software which can perform the various operations on databases is known as **Database Management System.**

What is a Database Management System (DBMS)?

A database management system is a software used to perform different operations, like **addition, access, updating, and deletion of the data,** like adding your name in the database for an online retail store as a customer. A database management system acts as the backbone of a database and makes using a database a cakewalk as it makes access and management of data a lot easier.
One thing we need to understand is the difference between **Database** and **Database Management System.**

Database VS Database Management System

Well, you may feel that a database and a database management system is a similar thing but there's a really big difference. Let's understand this with the help of an example.

Here, we can see an App or a website with its own database. So, the most function is to connect the database to the App or Website. While database can provide the data to the website and have a meaningful way to access data, it still cannot understand the language or method which a website may use to fetch the data, i.e., it cannot understand the commands on its own. Thus, to tackle this problem, we bring in the concept of **Database Management System.** A DBMS understand the commands and the queries which define what data is required by the App or Website and thus use the meaningful method of accessing the database to retrieve the information. Therefore, it can be said that a DBMS act as **connecting bridge** between the database and the user and DBMS actually understand the queries and help database to understand the requirements. So, the above image looks something like this:

Database acting as a connector between both the App and the database. With this basic difference is clear that a database store the data and provide a method to access it, a DBMS actually **converts the queries into a meaningful command to invoke the method used to access the database.**
Now, we can move forward to understand look at the type of **Databases.**

Different Types of Database

Databases can be classified into four major types:

- **Relational databases**
- **Hierarchical database**
- **Network database**
- **Object-oriented database**