Need for DBMS

Database System-

In DBMS we have users who write queries using some query language for example SQL (Structured Query Language).
These queries are processed by the DBMS (eg, MySQL, Oracle etc).
After queries are processed, based on results DBMS software accesses the stored data.

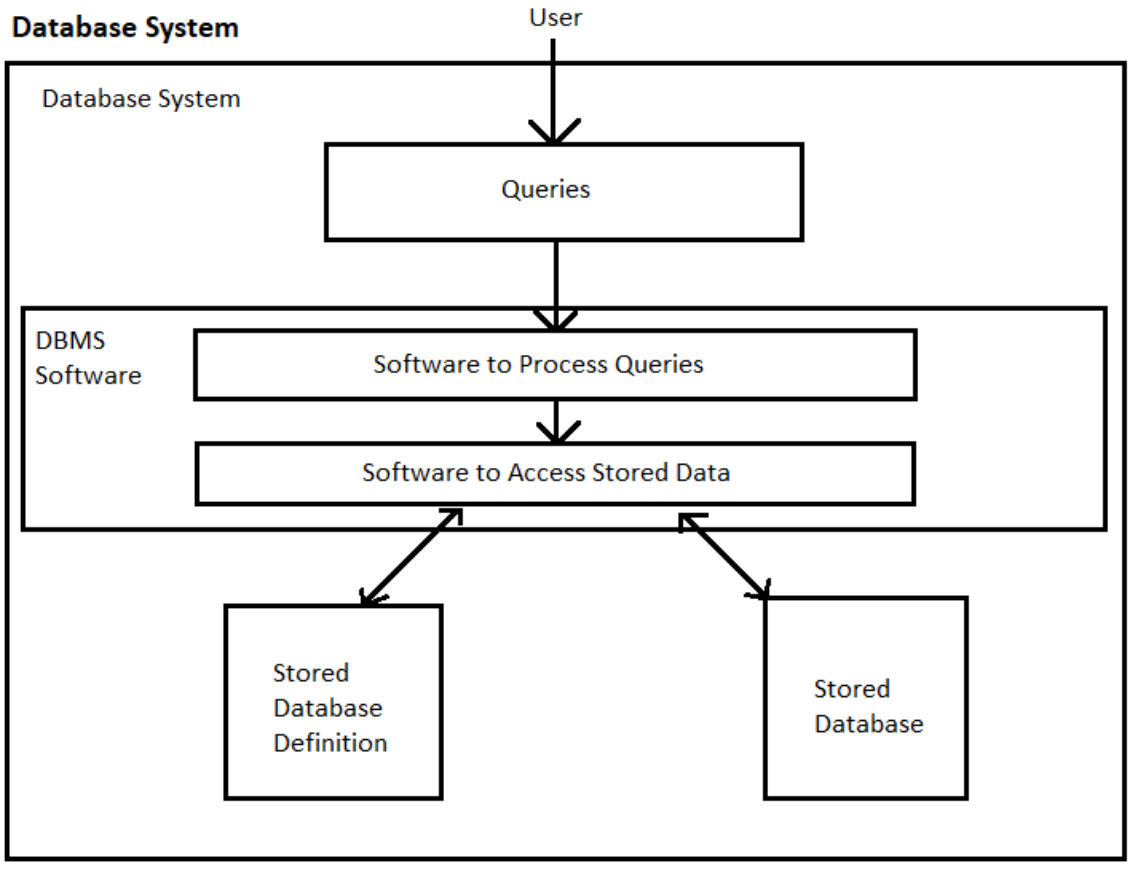

Figure : Database system

DBMS vs File System -

DBMS and File system both contain a collection of information and a set of programs by which we can access that data. Before DBMS we were using the file system approach.

Difference between DBMS vs File System -

DBMS	File System
DBMS is a software that helps in managing databases.	File systems help in managing files and organising them on a storage
The data is stored in databases.	The data is stored in files.
It coordinates both the physical and the logical access to the data.	It coordinates only the physical access.
It is designed to coordinate multiple users at the same time.	A file can be accessed by two programs concurrently only if both programs have read-only access to the file.
It gives an abstract view of data and hides the details.	The file system provides the detail of the data representation and storage of data.
Data inconsistency and redundancy could be reduced easily in DBMS.	It is hard to reduce data redundancy and inconsistency in the file system.
It provides a mechanism for data backup and data recovery.	If data is lost, we may not be able to recover it.

Advantages of DBMS -

- **Reduced redundancy**

In a traditional file system each user group maintains its own files which leads to data redundancy. This duplication of data or redundancy leads to wastage of storage space, and also inconsistency in data. In DBMS there are various methods(Normalization) by which we can remove data redundancy.

- **Data inconsistency**

Data inconsistency occurs when different versions of same data appear in different places. The chances of Data inconsistency get reduced a lot when the database is properly designed. Since in file system the different versions of same data may be present in different files and since there is no mechanism to handle it, file systems are more prone to data inconsistency.

- **Backup and Recovery**

The backup and recovery subsystem provides recovery options in case of system failure.
Example - You are transferring money from A's account to B's account, in case of system failure if the transaction got interrupted, the backup and recovery subsystem will try to resume the transaction or it'll restore it to previous state when transaction got started.

- **Integrity Constraints**

DBMS enforces integrity constraints to our data so that our database has only valid entries.
Example - If we are inserting the age of people in our database, then with the help of integrity constraints we'll make sure that it is a valid age i.e. it should not be negative.

- **Restricting Unauthorized Access**

DBMS allows multiple users with different access permissions to share a single database. DBMS provides a security and authorization subsystem to ensure this which is used by Database Administrator (DBA).