

DBMS

A database is a collection of related information stored so that it is available to many users for different purposes. The content of database is obtained by combining data from all the different sources in an organization. So that data are available to all users and redundant can be eliminated or at least minimize.

A computer database gives us some electronic filing system which has a large number of ways of cross-referencing and this allows the user many different ways in which to reorganize and retrieve data. The management of data in a database system is done by means of a general purpose software package called a database management system. A database management system, therefore, is a combination of hardware and software that can be used to set up and monitor a database, and can manage the updating and retrieval of database that has been stored in it. Some commercially available DBMS are INGRESS, ORACLE, Sybase. Most database management systems have the following facilities/capabilities.

- Creating a file, addition of data, deletion of data, modification of data, creation addition and deletion of entire file.
- Retrieving data collectively or selectively.
- The data stored can be sorted or indexed at the user's direction. Various reports can be produced from the system.

Advantage of DBMS:-

1. **Reduction of redundancies**- Centralized control of database by the DBA avoids unnecessary duplication of data and effectively reduces the total amount of data storage required. It also eliminated the extra necessary to trace the required data in a large mass of data. Another advantage of avoiding duplication is the elimination of the inconsistencies that tend to be present in redundant

data files. Any redundancies that exists in the DBMS are controlled and the system ensures that these multiple copies are consistent.

2. **Data Sharing:-** A database allows the sharing of data under its control by any number of application programs or users.
3. **Data Integrity:-** Data integrity means that the data contained in the database is both accurate and consistent. Therefore, data values being entered for storage could be checked to ensure that they fall within a specified range and are of the correct format. Another integrity check that could be incorporated in the database is to ensure that if there is a reference to certain object, that object must exist.
4. **Data security:-** Data is of vital importance to an organization and may be confidential. Such confidential data must not be accessed by unauthorized persons. The DBA who has the ultimate responsibility for the data in the DBMS can ensure that proper access procedures are followed, including proper authentication schemas for access to the DBMS and additional checks before permitting access to sensitive data.
5. **Conflict resolution:-** Since the database is under the control of the DBA, she or he should resolve the conflicting requirements of various users and applications. In essence, the DBA chooses the best file structure and access method to get optimal performance for the response- critical application, while permitting less critical application to continue to use the database, albeit with a relatively slower response.
6. **Data Independence:-** Data independence, is usually considered from two points of view:

physical data independence and logical data independence.

Physical data independence allows changes in the physical storage device organization of the files to be made without requiring changes in the conceptual view or any of the external views and hence in the application programs using the database. Thus the file may migrate from one type of physical media to another or the file structure may change without any need for change in the application programs.

Logical data independence implies that application programs need not be changed if fields are added to an existing records, nor do they have to be changed if fields not used by application programs are deleted. Logical data independence indicated that the conceptual schema can be changed without affecting the existing external schemas.

Data independence is advantageous in the database environment since it allows for change at one level of the database without effecting other levels.

Disadvantage of DBMS:-

A significant disadvantage of the DBMS is cost. In addition to the cost of purchasing or developing the software, the hardware has to be upgraded to allow for extensive programs and the work spaces required for their execution and storage.

The processing overhead introduced by the DBMS to implement security, integrity and sharing of the data causes a degradation of the response and throughput times.

While centralization reduces duplication, the lack of duplication requires that the database

be adequately backed up so that in the case of failure the data can be recovered. Backup and recovery operations are fairly complicated in the DBMS environment. Ad database system requires a certain amount of controlled redundancies and duplication to enable access to related data items.