Advantages of DBMS

One of the main advantages of using a database system is that the organization can exert, via the DBA, centralized management and control over the data. The database administrator is the focus of the centralized control. Any application requiring a change in the structure of a data record requires an arrangement with the DBA, who makes the necessary modifications. Such modifications do not affect other applications or users of the record in question.

Advantages of DBMS...

- **Reduction of Redundancies:** Centralized control of data by the DBA avoids unnecessary duplication of data and effectively reduces the total amount of data storage required. It also eliminates the extra processing necessary to trace the required data in a large mass of data.

Advantages of DBMS...

- **Elimination of Inconsistencies:** The main advantage of avoiding duplication is the elimination of inconsistencies that tend to be present in redundant data files. Any redundancies that exist in the DBMS are controlled and the system ensures that these multiple copies are consistent.

Advantages of DBMS...

- **Shared Data:** A database allows the sharing of data under its control by any number of application programs or users. For example, the applications for the public relations and payroll departments can share the same data.

Advantages of DBMS...

- **Integrity:** Centralized control can also ensure that adequate checks are incorporated in the DBMS to provide data integrity. Data integrity means that the data contained in the database is both accurate and consistent. Therefore, data values being entered for the storage could be checked to ensure that they fall within a specified range and are of the correct format.

Advantages of DBMS...

➢**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 schemes for access to the DBMS and additional checks before permitting access to sensitive data. Different levels of security could be implemented for various types of data and operations.

Advantages of DBMS...

- **Conflict Resolution:** Since the database is under the control of the DBA, he/she 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 applications, while permitting less critical applications to continue to use the database, albeit with a relatively slower response.

Advantages of DBMS...

- **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 devices or 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 files may migrate from one type of physical media to another or the file structure may change without any need for changes in the application program.

Advantages of DBMS...

- **Logical data independence** implies that application programs need not be changed if fields are added to an existing record; nor do they have to be changed if fields not used by applications programs are deleted. Logical data independence indicates 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 changes at one level of the database without affecting other levels. These changes are absorbed by the mapping between the levels.

Disadvantages of DBMS

- **Cost of software/hardware and migration:**

A significant disadvantage of the DBMS system is cost. In addition to the cost of purchasing or developing the software, the hardware has to be upgraded to allow for the extensive programs and work spaces required for their execution and storage. The processing overhead introduced by DBMS to implement security, integrity, and sharing of the data causes a degradation of the response and through-put times. An additional cost is that of migration from a traditionally separate application environment to an integrated one.

Disadvantages of DBMS...

➢**Problem associated with centralization:** 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. Centralization also means that the data is accessible from a single source. This increases the potential severity of security breaches and disruption of the operation of the organization because of downtimes and failures. The replacement of a monolithic centralized database by a federation of independent and cooperating distributed databases resolves some of the problems resulting from failures and downtimes.

Disadvantages of DBMS...

- **Complexity of Backup and Recovery:** Backup and recovery operations are fairly complex in a DBMS environment, and this is exacerbated in a concurrent multi user database system. Furthermore, a database system requires a certain amount of controlled redundancies and duplication to enable access to related data items.