INTRODUCTION TO DATABASE MANAGEMENT :  ARCHITECTURE OF DATABASE MANAGEMENT SYSTEM (DBMS)

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    Database Management System (DBMS) is a collection of general purpose, application-independent program providing services to define the structure of a database. For example, data types and constraint that the data will have to satisfy. Next, it manages the storage of data safely for long period of time, on some storage medium controlled by DBMS, it manipulates a database with efficient user interfaces. Lastly, it monitors and analyze database usage.

     The design of a DBMS depends on its architecture. It can be centralized or decentralized or hierarchical. There are three levels of DBMS architecture which is, external level, conceptual level and internal level. The objective of three level architecture is to separate each user’s view of the database from the way the database is physically represented. There are several reasons why this separation is needed. One of the reason is the internal structure of the database should be unaffected by changes to physical aspects of storage, such as the changeover to a new storage device. The other reason is each user should be able to access the same data but have a different customized view of the data. Each user should be able to change the way he or she views the data, and this change should not affect other users.

    The first level is external level. This level is the one which is closest to the end users. This level describe that part of the database that is relevant to each user. Individual users are given different views of same data according to the user’s requirement. For example, one user may view dates in the form (day, month, year), while another may view dates as (year, month, day). The external view protect users from the details of the internal and conceptual levels. Generally, external level is also known as the view level. The next level of DBMS architecture is conceptual level or logical level. This level describes what data is stored in the database and the relationships among the data. This level contains the logical structure of the entire database as seen by the DBA. The conceptual level represents all entities, attributes and their relationship. However, this level must not contain any storage dependent details. The last one is internal level also known as storage level. It is the physical representation of the database on the computer. This level describes how the data is stored in the database. The internal level is the one that concerns the way the data are physically stored on the hardware and it covers the data structures and file organizations used to store data on storage devices. The internal level involved things like storage space allocation for data, record descriptions for storage, data compression and data encryption techniques.

    In conclusion, the architecture of DBMS is very important in development of database management system. It can differentiate the view of the data as required by the users of the system.