Topic: - Architecture of DBMS

DBMS is a collection of interrelated files and a set of programs that allow several users to access and modify these files. A major purpose of a database system is to provide users with an abstract view of the data.

The concern for efficiently lead to the design of complex data structure for the representation of data in the database. This is done by defining levels of abstract as which the database may be viewed, these are logical view or external, conceptual view and internal view or physical view.

External view – This is the highest level of abstraction as seen by a user. This level of abstraction describes only the part of entire database.

Conceptual view – This is the next higher level of abstraction which is the sum total of user's views. This level describes what data are actually stored in the database.

Internal level – This is the lowest level of abstraction at which one describes how the data are physically stored.

A database management system that provides these three levels of data is said to follow three level architectures –

i. External level

ii. Conceptual level

iii. Internal level

The view at each of these levels is described by a schema. A schema describes the records and relationships existing in the view. The schema also describes the way in which entities at one level of abstraction can be mapped to the next level. The overall design of the database is called the database schema. A database schema includes such information as –

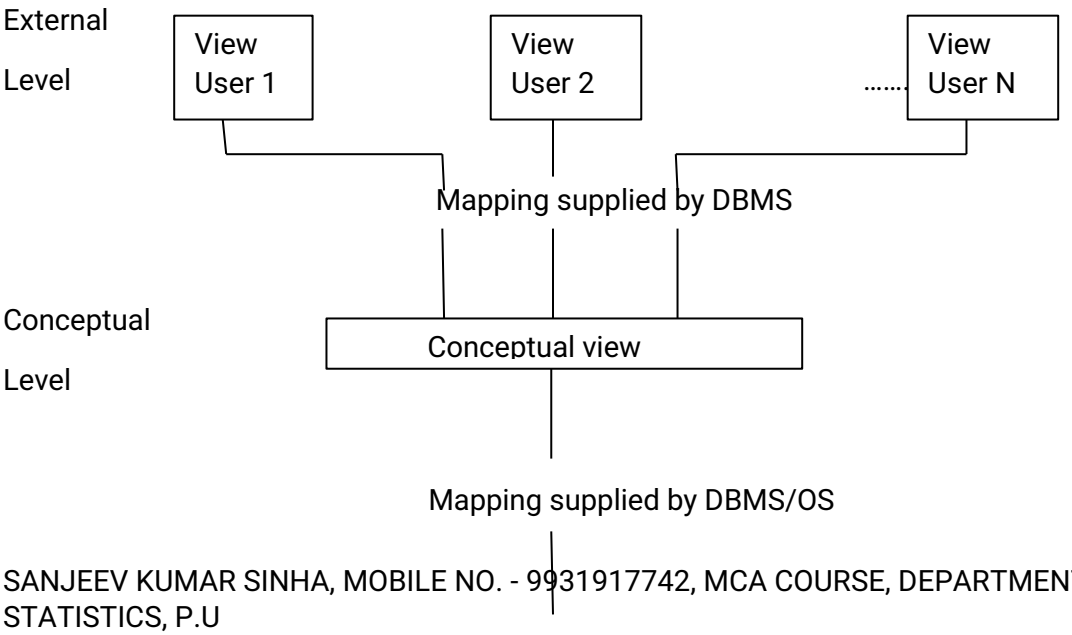
- ➔ Characteristics of data items such as entities and attributes
- ➔ Logical structure and relationship among those data items
- ➔ Format for storage representation
- ➔ Integrity parameters such as physically authorization and backup policy.

The concept of database schema corresponds to programming language. A variable of a given type has a particular value at a given instant in time. The concept of an instance is a database schema. At the lower level we have the physical schema. At the

intermediate level we have the conceptual schema, while at the higher level we have a subschema. In general database system supports one physical schema, one conceptual schema and several subschemas.

- ➔ External level or subschema – The external level is at the highest level of database abstraction where only those portions of the database of concern to a user or application program are included. Any number of user views may exist for a given global or conceptual view. Each external view is described by means of a schema called an external schema or subschema. The external schema consists of the definition of the logical records and the relationship in the external view.
- ➔ Conceptual level or conceptual schema – At this levels of database abstraction all the database entities and the relationships among them are included. One conceptual view represents the entire database. This conceptual view is defined by the conceptual schema. It describes all the records and relationship included in the conceptual view in the database.
- ➔ Internal level or Physical schema – A the lowest level of abstraction, closest to the physical storage method used. It indicates how the data will be stored and describes the data structures and access methods to be used by the database. The internal view is expressed by the internal schema, which contains the definition of the stored record, the method of representing the data fields and the access used.

The mapping of these levels –



Internal Level