Three Schema Architecture

The Three Schema Architecture tells how the data is represented in a database. The Three Schema Architecture is also known as three-level architecture or ANSI/ SPARC architecture.

This architecture is used to divide the database into 3 levels to separate the user and the physical database. This helps in providing abstraction to the users who may not require all the details.It basically hides the physical storage details from the user.

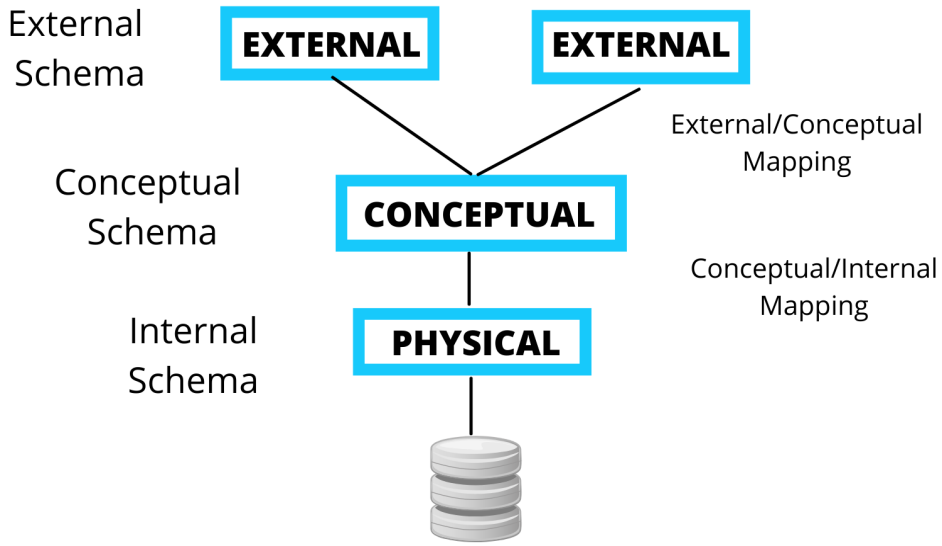

Figure: Three Schema Architecture

1. Physical Layer

The Physical Layer contains the internal Schema which defines the physical storage structure of the database. The internal schema is the low-level representation of the database. The internal Schema tells us what data is stored in the database and how?.

Major points related to physical layer are:

a. How data is stored in a database.
b. It shows the actual representation of the database.

2. Conceptual Layer

Conceptual Layer contains the conceptual Schema. It is designed to represent the organization of data as relations and records. If a change is to be made in the conceptual schema it should not affect the existing external schema.

Major points related to the Conceptual Layer are:

a. It describes the structure of Schema for the community or set users.
b. It hides the Physical Structure/Schema.
c. Representational Model is an example of Conceptual Schema.

3. External Layer

External layer is the highest level in the three level architecture and is also known as the view level. It is used as a view for a number of users due to this we can have multiple external levels. It only shows the relevant database content to the users in the form of views and hides the rest of the data. Same database is used to provide different sets of data to different sets of users.

Major points related to the External Layer are:

a. To provide access control.
b. It handles the way the users visualize the database according to their need.

Data Independence

Data Independence in DBMS is the property to modify the definition of a schema in a level without affecting the definition of schema in other levels.
There are two levels of Data Independence:

1. Physical Data Independence
2. Logical Data Independence

Physical Data Independence

Physical Data Independence is the property to modify the Physical Schema without changing the Logical and Conceptual level.

- Physical Data Independence can be used to change the storage device from one to another without affecting the Logical level.

- This allows us to provide a logical description without the need to specify any physical structures of the database.
- It also separates the conceptual level from the other internal levels.

Logical Data Independence

Logical Data Independence is the property to modify the Conceptual Schema without changing the external level.

- In Logical Data Independence ,any change done at the logical level the external view of the data remains unchanged.
- It is used to change the definition of data.