



SNS COLLEGE OF ENGINEERING
Kurumbapalayam (Po), Coimbatore – 641 107



An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING-IOT Including CS&BCT
UNIT-I

VIEWS OF DATA

A major purpose of a database system is to provide users with an abstract view of the data i.e the system hides certain details of how the data are stored and maintained.

Views have several other benefits.

- ✓ Views provide a level of security. Views can be setup to exclude data that some users should not see.
- ✓ Views provide a mechanism to customize the appearance of the database.
- ✓ A view can present a consistent, unchanging picture of the structure of the database, even if the underlying database is changed.

The ANSI / SPARC architecture defines three levels of data abstraction.

- ✓ External level / logical level
- ✓ Conceptual level
- ✓ Internal level / physical level

The objectives of the three level architecture are to separate each user's view of the database from the way the database is physically represented.

External level

The users' view of the database External level describes that part of the database that is relevant to each user. The external level consists of a number of different external views of the database. Each user has a view of the 'real world' represented in a form that is familiar for that user. The external view includes only those entities, attributes, and relationships in the real world that the user is interested in. The use of external models has some very major advantages,

- ✓ Makes application programming much easier.
- ✓ Simplifies the database designer's task.
- ✓ Helps in ensuring the database security.

Conceptual level

The community view of the database conceptual level describes what data is stored in the database and the relationships among the data. The middle level in the three level architecture is the conceptual level. This level contains the logical structure of the entire database as seen by the DBA. It is a complete view of the data requirements of the organization that is independent of any storage considerations. The

conceptual level represents:

- ✓ All entities, their attributes and their relationships
- ✓ The constraints on the data
- ✓ Semantic information about the data
- ✓ Security and integrity information.



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The conceptual level supports each external view. However, this level must not contain any storage dependent details. For instance, the description of an entity should contain only data types of attributes and their length, but not any storage consideration such as the number of bytes occupied.

Internal level

The physical representation of the database on the computer Internal level describes how the data is stored in the database. The internal level covers the physical implementation of the database to achieve optimal runtime performance and storage space utilization. It covers the data structures and file organizations used to store data on storage devices. The internal level is concerned with

- ✓ Storage space allocation for data and indexes.
- ✓ Record descriptions for storage
- ✓ Record placement.
- ✓ Data compression and data encryption techniques.
- ✓ Below the internal level there is a physical level that may be managed by the operating system under the direction of the DBMS

Physical level

The physical level below the DBMS consists of items only the operating system knows such as exactly how the sequencing is implemented and whether the fields of internal records are stored as contiguous bytes on the disk.

Instances and Schemas

Similar to types and variables in programming languages which we already know, Schema is the logical structure of the database E.g., the database consists of information about a set of customers and accounts and the relationship between them) analogous to type information of a variable in a program.

Physical schema: database design at the physical level

Logical schema: database design at the logical level