

Three level

Schema Architecture

CSI-406 Database Systems



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3-Level Schema Architecture

- Defines DBMS schemas at three levels:
 1. **Internal schema** at the internal level to describe physical storage structures and access paths. Typically uses a physical data model.
 2. **Conceptual schema** at the conceptual level to describe the structure and constraints for the whole database for a community of users. Uses a conceptual or an implementation data model.
 3. **External schemas** at the external level to describe the various user views. Usually uses the same data model as the conceptual level.





3-Level Schema Architecture cont... WISDOMTECH BRINGS WISDOM TO TECHNOLOGY

- Proposed to support DBMS characteristics of:
 1. Program-data independence.
 2. Support of multiple views of the data.



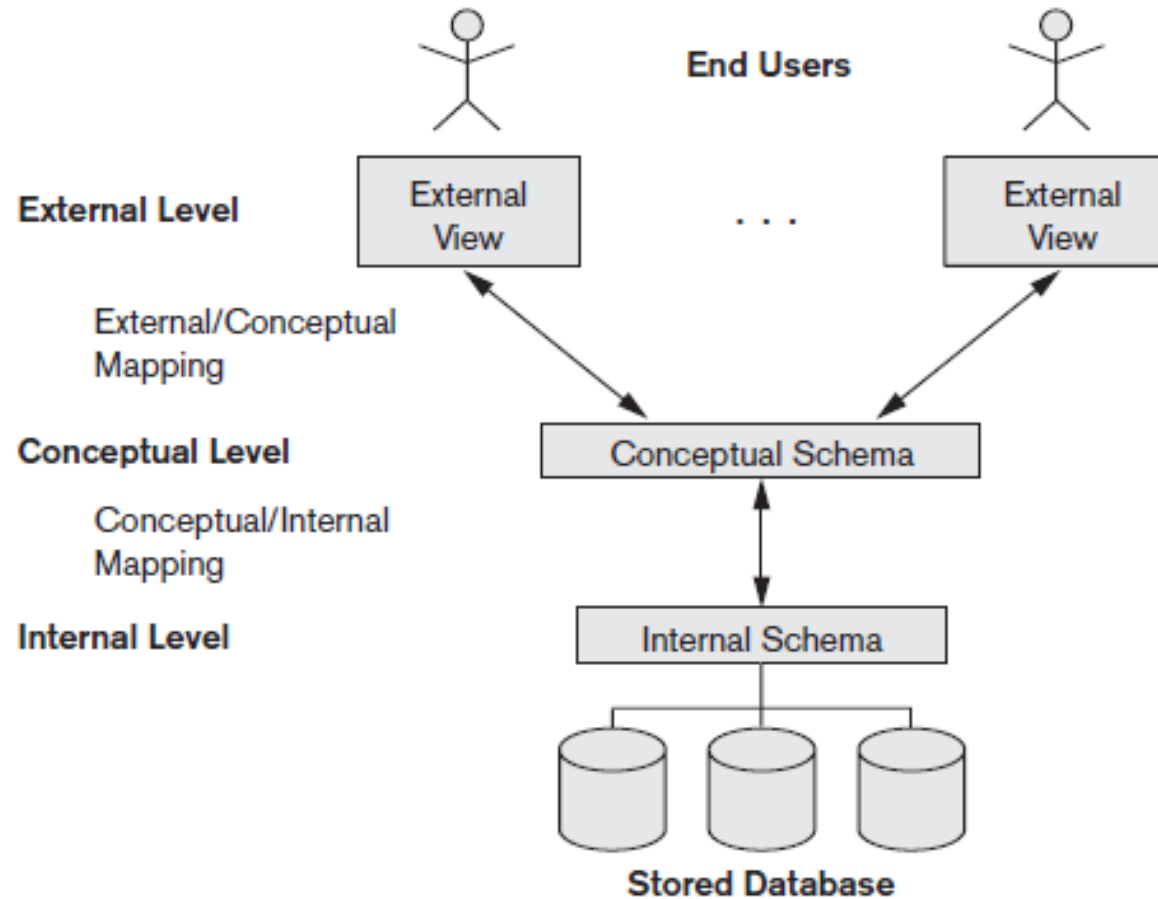


3-Level Schema Architecture cont... WISDOMTECH BRINGS WISDOM TO TECHNOLOGY

- **Mappings** among schema levels are needed to transform requests and data.
- Programs refer to an external schema, and are mapped by the DBMS to the internal schema for execution.



3-Level Schema Architecture cont... BRINGS WISDOM TO TECHNOLOGY



3-Level Schema Architecture cont...

Data Independence



- **Logical Data Independence**: The capacity to change the conceptual schema without having to change the external schemas and their application programs.
- **Physical Data Independence**: The capacity to change the internal schema without having to change the conceptual schema.



3-Level Schema Architecture cont...

Data Independence

- When a schema at a lower level is changed, only the mappings between this schema and higher-level schemas need to be changed in a DBMS that fully supports data independence.
- The higher-level schemas themselves are unchanged.
- Hence, the application programs need not be changed since they refer to the external schemas.

3-Level Schema Architecture cont...

Data Independence

