



# Architecture of a Database Management System (DBMS)

- ▶ Components and Functions.

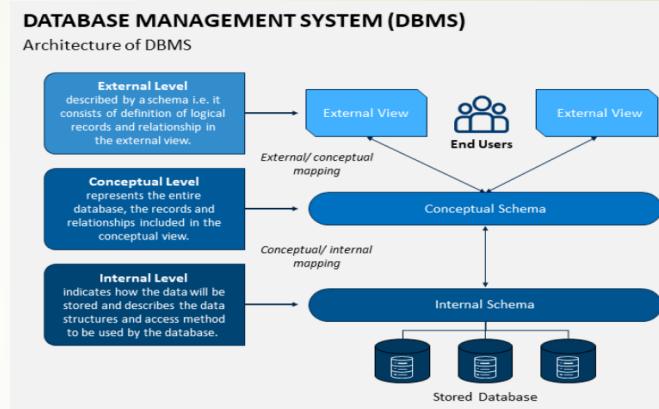
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# Introduction to DBMS.

- ▶ A DBMS is software that manages data, databases, and users.
  - ▶ Provides a systematic and organized way of storing, retrieving, and managing data.
  - ▶ Ensures security, consistency, integrity, and performance.
  - ▶ Follows a layered architecture to simplify data management.

# DBMS Architecture Overview

- ▶ Three main levels of DBMS architecture:
  - ▶ 1. External Level (View Level)
  - ▶ 2. Conceptual Level (Logical Level)
  - ▶ 3. Internal Level (Physical Level)
  - ▶ This is known as the Three-Schema Architecture.



# External Level (View Level)

- ▶ Provides different user views of the same database.
  - ▶ Ensures security by restricting access to specific data.
  - ▶ Each user interacts only with the data they need.
  - ▶ Hides internal complexity.



# Conceptual Level (Logical Level)

- ▶ Represents the entire database structure.
  - ▶ Defines entities, relationships, constraints, and data types.
  - ▶ Independent of physical storage.

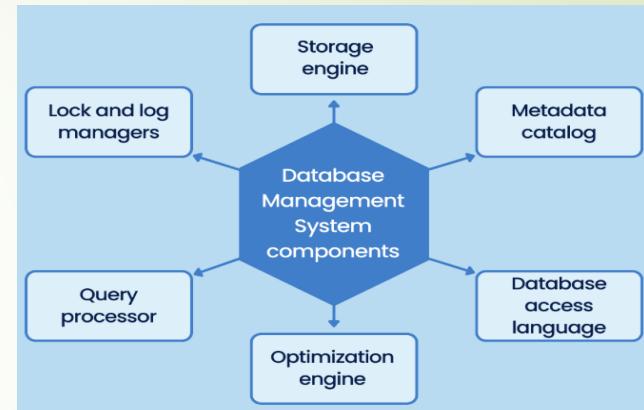


# Internal Level (Physical Level)

- ▶ Deals with how data is actually stored in memory/disks.
  - ▶ Includes file structures, indexes, hashing, data compression.
  - ▶ Focuses on performance and efficiency.

# Major Components of DBMS

- ▶ Query Processor
  - ▶ Storage Manager
  - ▶ Lock and log manager
  - ▶ Buffer Manager
  - ▶ Metadata Catalog
  - ▶ Authorization & Security Module





# Functions of DBMS

- ▶ Data Storage, Retrieval & Update
  - ▶ Transaction Management (ACID properties)
  - ▶ Concurrency Control
  - ▶ Backup & Recovery
  - ▶ Security & Authorization
  - ▶ Data Integrity Enforcement
  - ▶ Data Independence

# Summary

- ▶ DBMS architecture consists of three levels: external, conceptual, internal.
  - ▶ Components work together to ensure: efficient data storage, secure access, high performance, reliability and data integrity.
  - ▶ DBMS is essential for modern applications requiring structured data management.



# THANK YOU