SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Department of Information Technology

19CST202 – Database Management System
II B.Tech. AIML/ IV SEMESTER

UNIT I : INTRODUCTION

Topic 1 : Three-schema architecture of DBMS, Components of DBMS

Purpose of Database System - Views of data – Data models, Database Management system - Three-schema architecture of DBMS, Components of DBMS. Entity –Relationship Model - Conceptual data modeling - motivation, entities, entity types, attributes, relationships, relationship types, E/R diagram notations, Examples
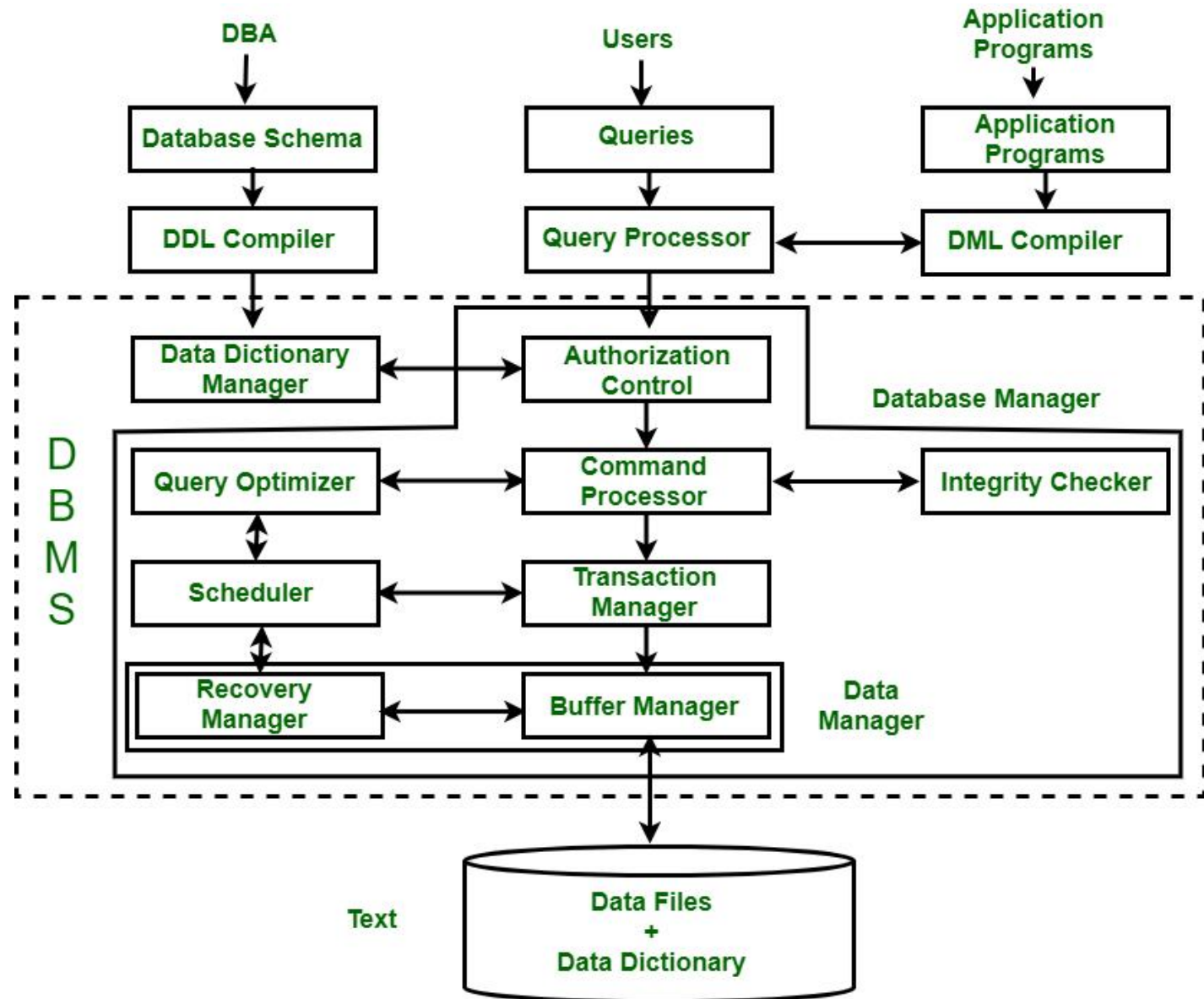
Recap

- A collection of tools for describing
  - Data
  - Data relationships
  - Data semantics
  - Data constraints

- **Relational model**

- **Entity-Relationship data model (mainly for database design)**

- Object-based data models (Object-oriented and Object-relational)

- Semistructured data model (XML)

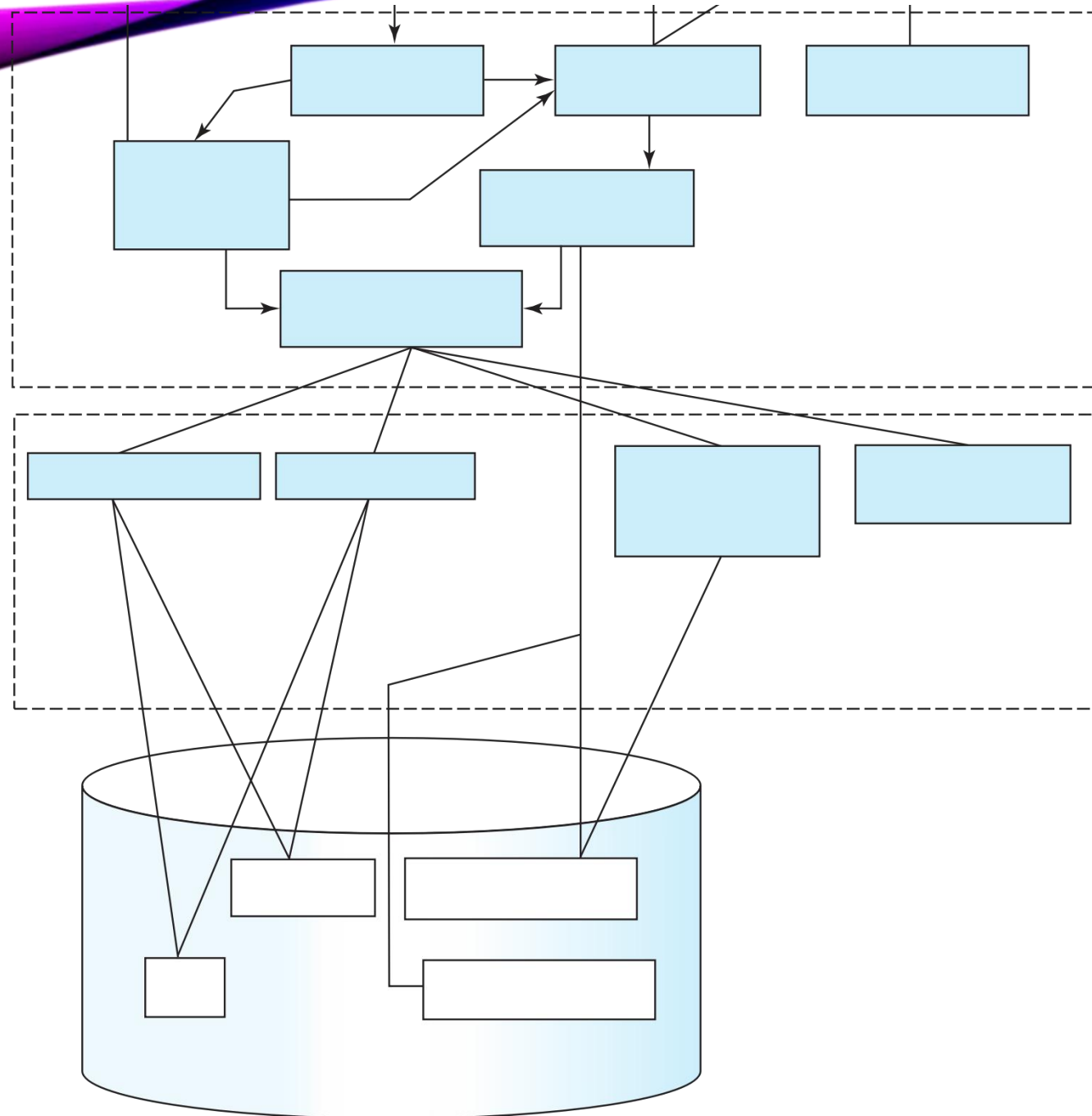- Other older models:
  - Network model
 - Hierarchical model

Structure of DBMS

Database Architecture (Centralized/Shared-Memory)

- Database applications are usually partitioned into two or three parts

- **Two-tier architecture** -- the application resides at the client machine, where it invokes database system functionality at the server machine

- **Three-tier architecture** -- the client machine acts as a front end and does not contain any direct database calls.

  - The client end communicates with an application server, usually through a forms interface.

  - The application server in turn communicates with a database system to access data.
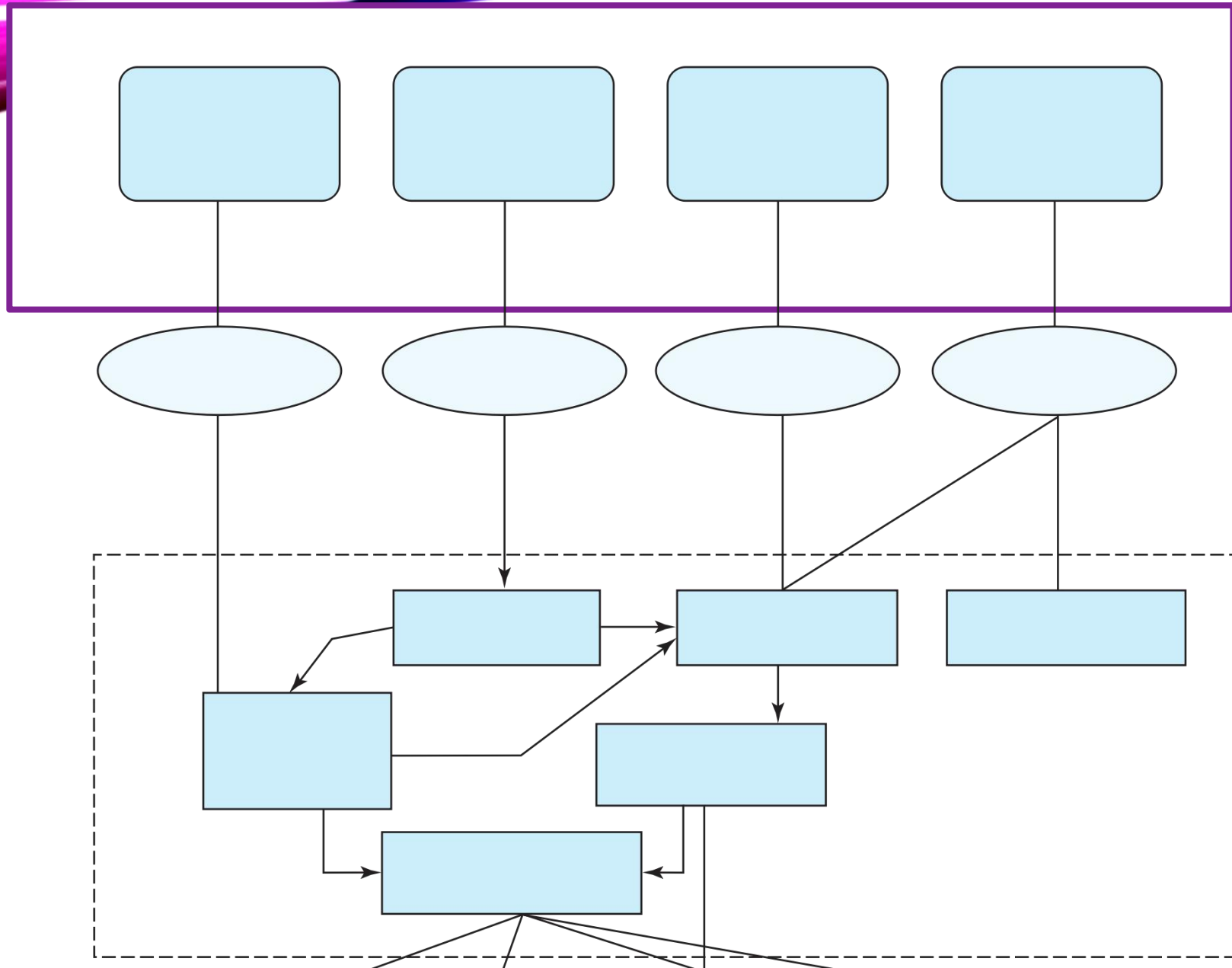
Two-tier and three-tier architectures
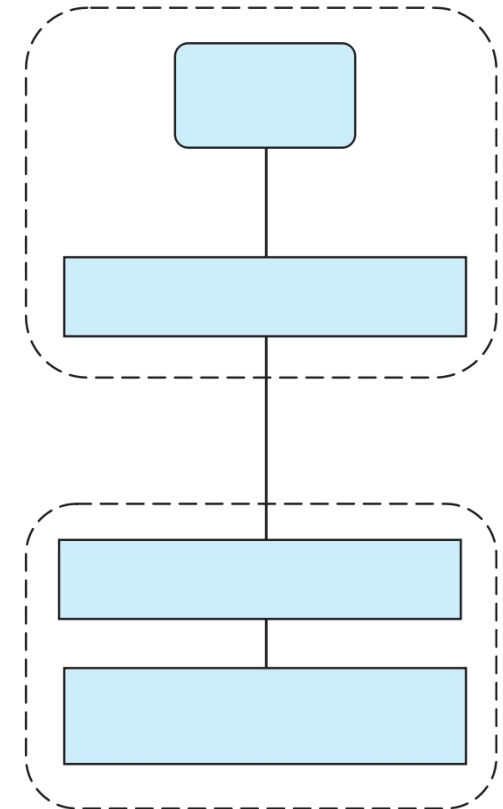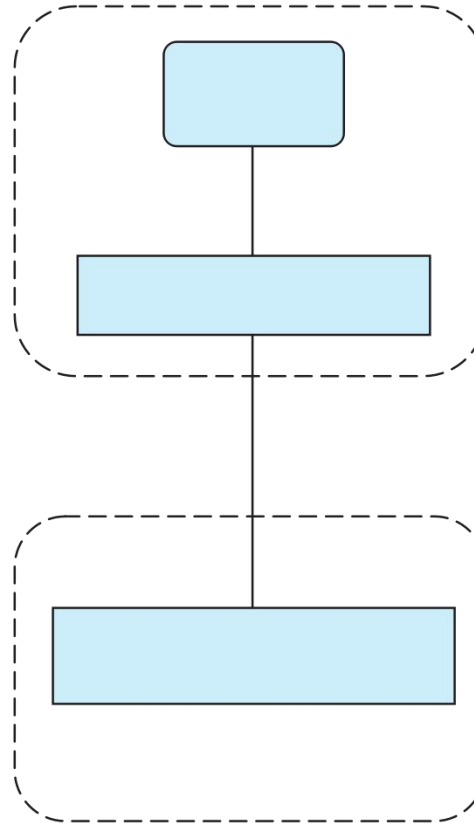
Database Users

- A person who has <mark>central control over the system</mark> is called a **database administrator** (**DBA**). Functions of a DBA include:

  - Schema definition

  - Storage structure and access-method definition

  - Schema and physical-organization modification

  - Granting of authorization for data access

  - Routine maintenance

  - Periodically backing up the database

  - Ensuring that enough free disk space is available for normal operations, and upgrading disk space as required

  - Monitoring jobs running on the database

History of Database Systems

- 1950s and early 1960s:
  - Data processing using magnetic tapes for storage

- Late 1960s and 1970s:
  - Hard disks allowed direct access to data

- 1980s:
  - Research relational prototypes evolve into commercial systems
    - SQL becomes industrial standard
  - Parallel and distributed database systems
    - Wisconsin, IBM, Teradata
  - Object-oriented database systems

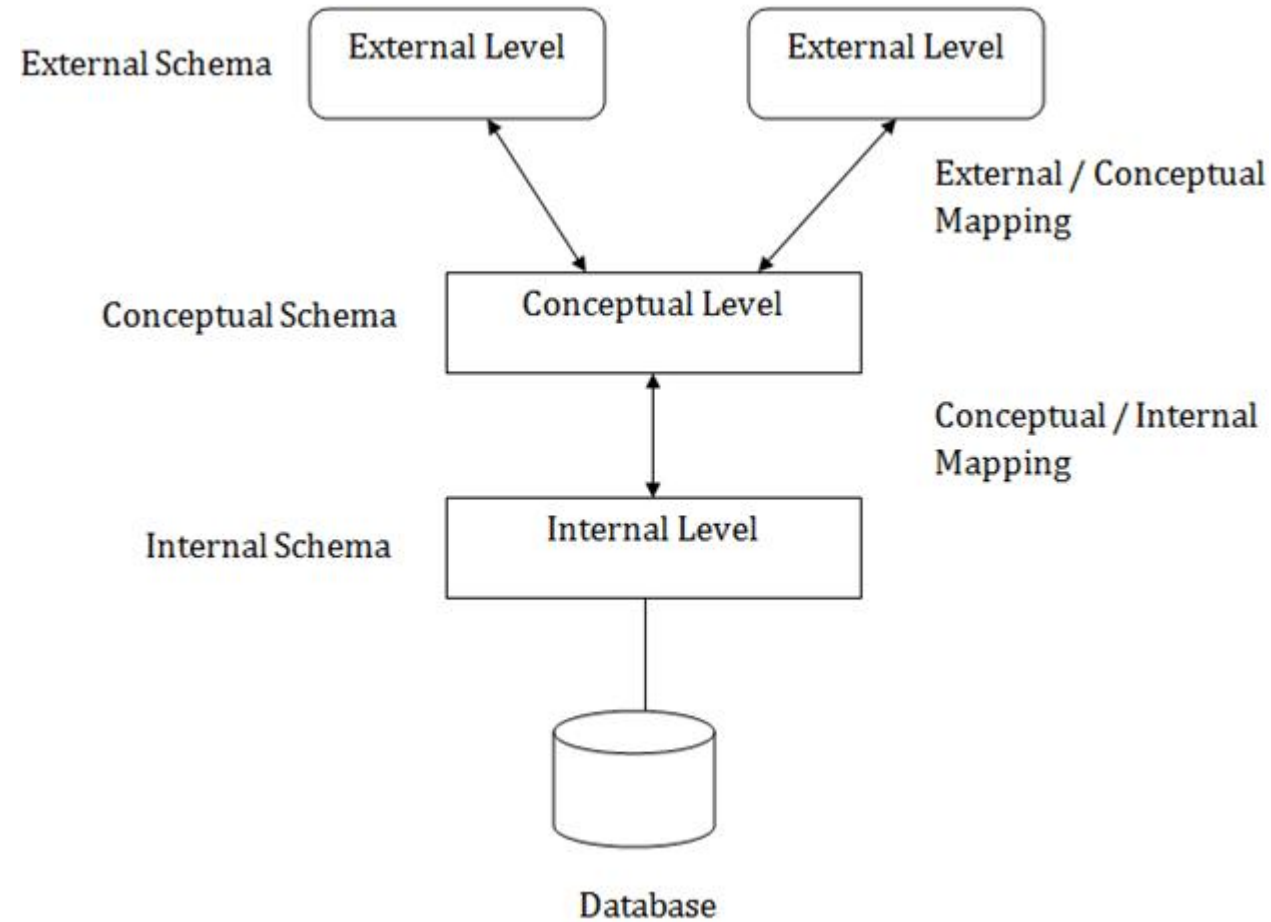# History of Database Systems

- 1990s:
  - Large decision support and data-mining applications
  - Large multi-terabyte data warehouses
  - Emergence of Web commerce
- 2000s
  - Big data storage systems
    - Google BigTable, Yahoo PNuts, Amazon,
    - "NoSQL" systems.
  - Big data analysis: beyond SQL
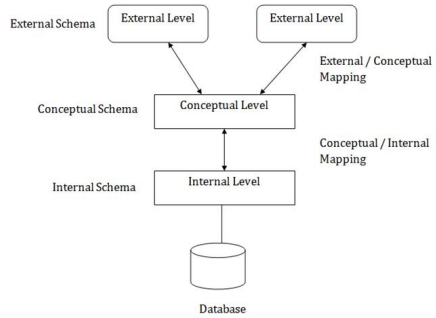   - Map reduce and friends

- 2010s
  - SQL reloaded
    - SQL front end to Map Reduce systems
    - Massively parallel database systems
    - Multi-core main-memory databases

Three-schema architecture of DBMS

Three-schema architecture of DBMS

External Schema

External Level | External Level

External / Conceptual Mapping

Conceptual Schema | Conceptual Level

Conceptual / Internal Mapping

Internal Schema | Internal Level

Database

Global view

EMPLOYEE

Empno : Integer(4) Key
Ename : String(15)
Salary : String (8)
Deptno : Integer(4)
Post : String (15)

Internal view

STORED_EMPLOYEE record length 60

Empno : 4 decimal offset 0 unique
Ename : String length 15 offset 4
Salary : 8,2 decimal offset 19
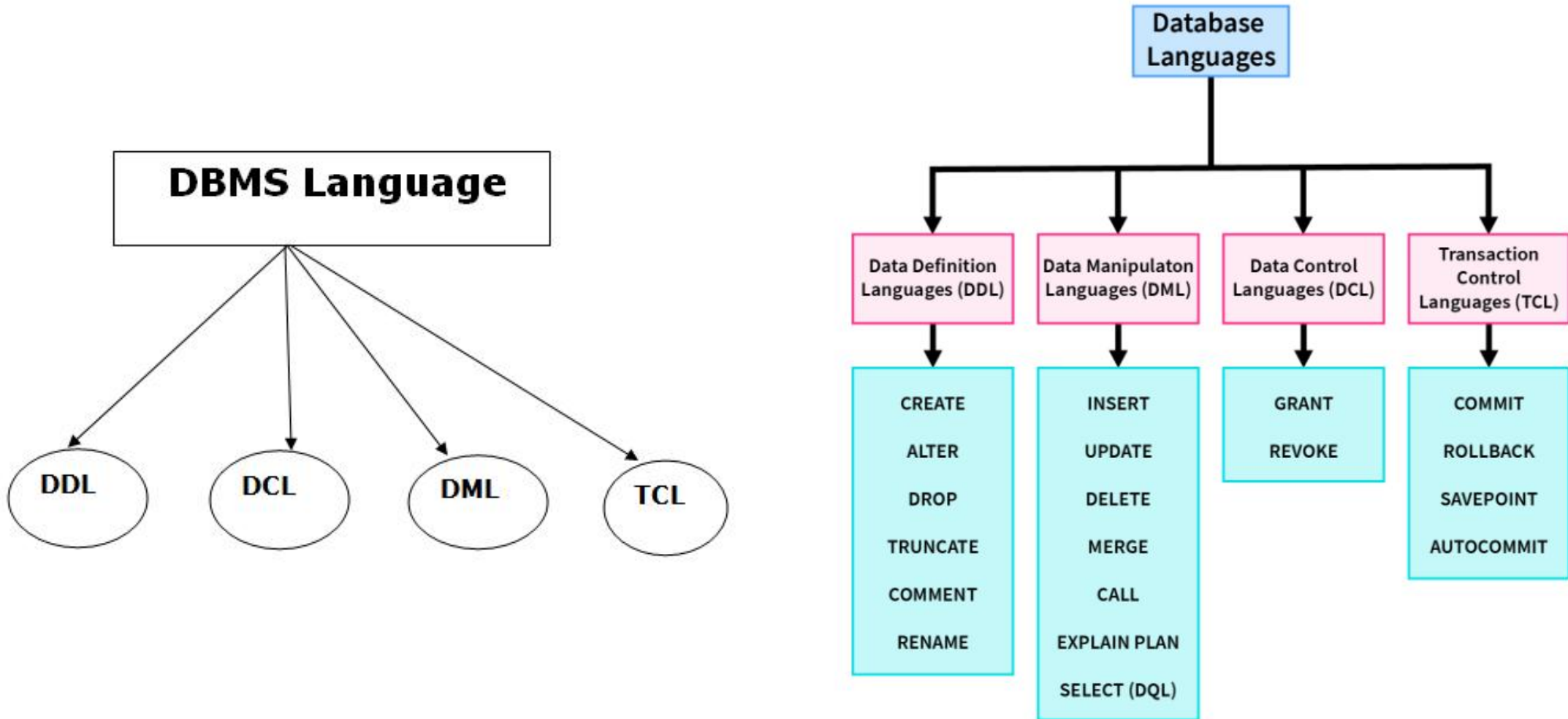Deptno : 4 decimal offset 27
Post : string length 15 offset 31

External View

Empno	Ename

Empno	Ename	Salary	DeptNo

Types of Database Languages
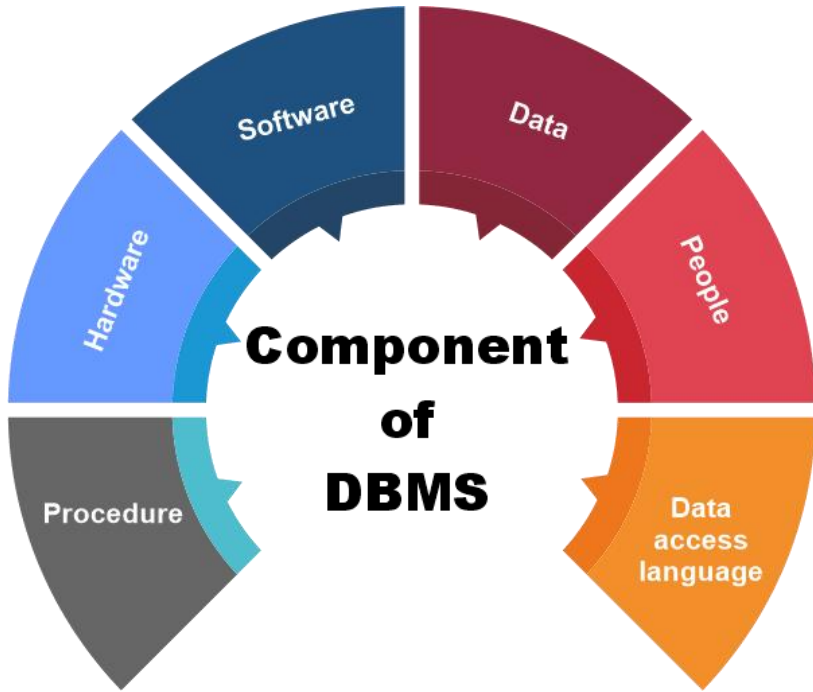
Components of DBMS
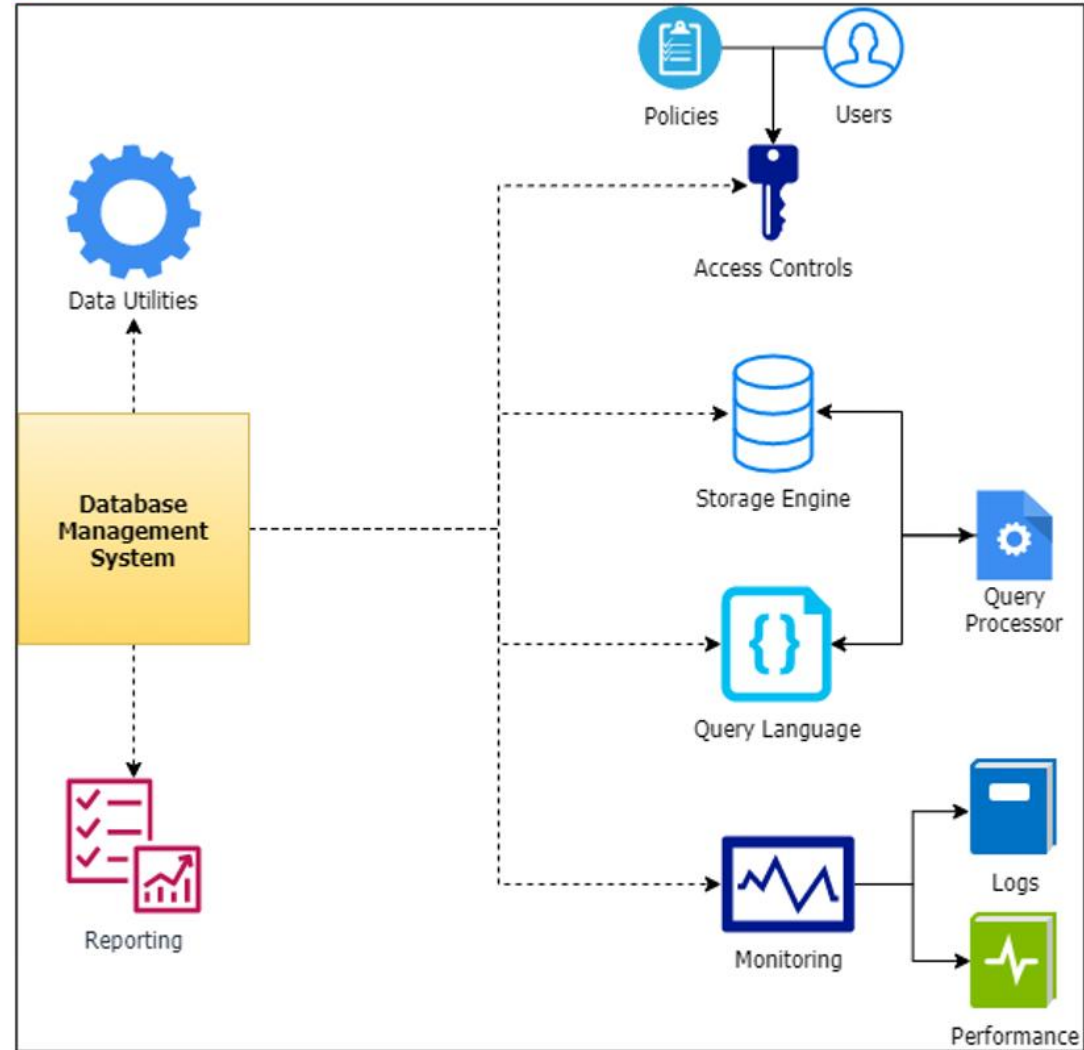
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