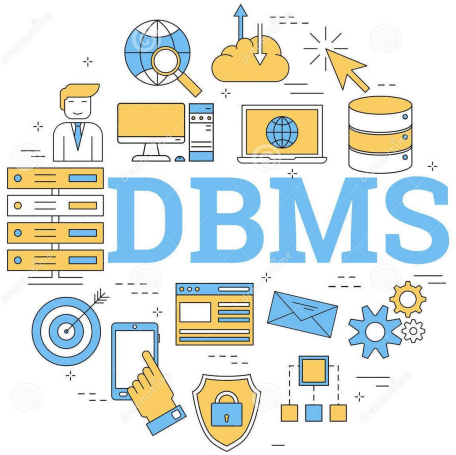
SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Department of Information Technology



19CST202 – Database Management System

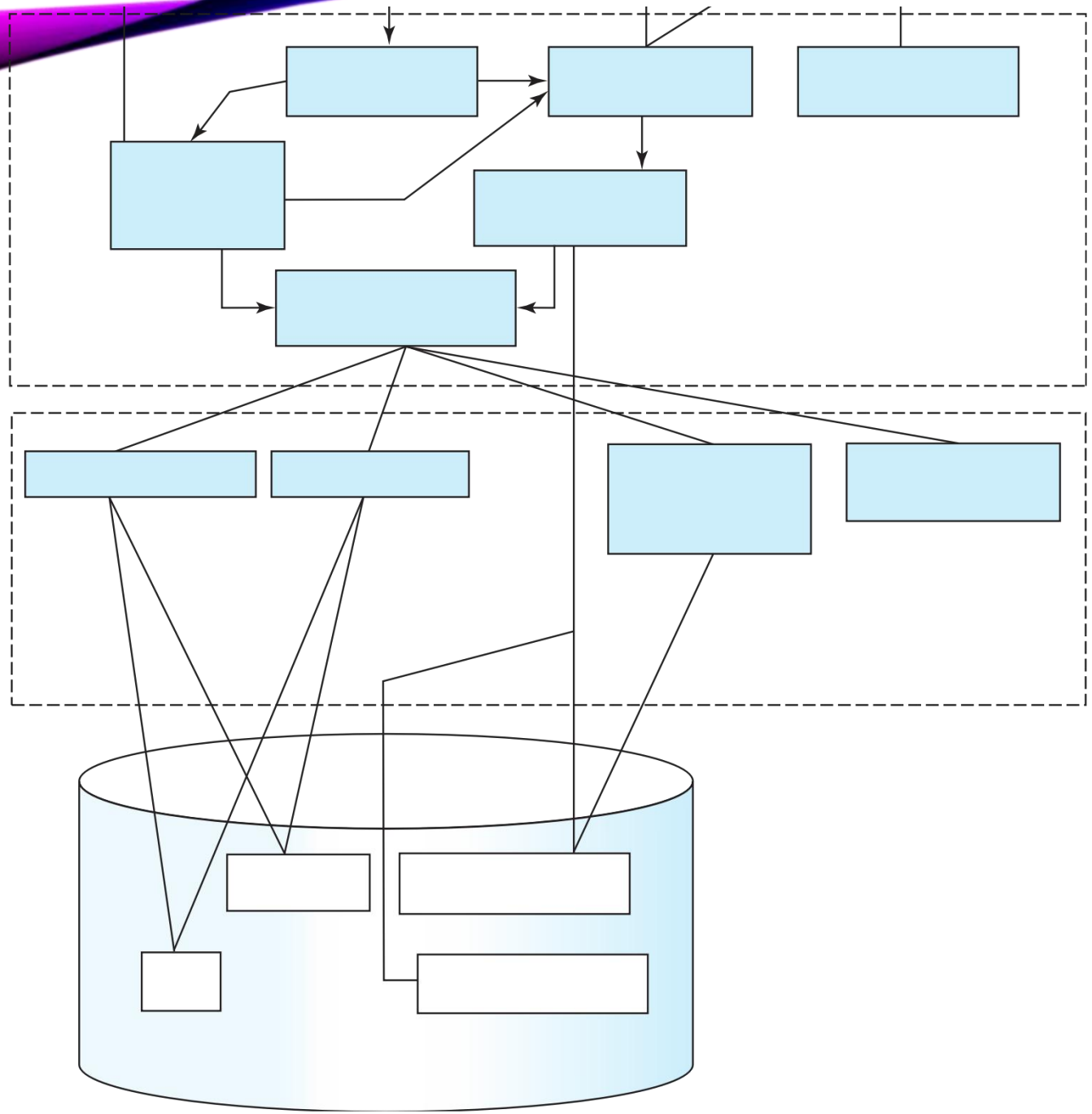
II B.Tech. AIML/ IV SEMESTER

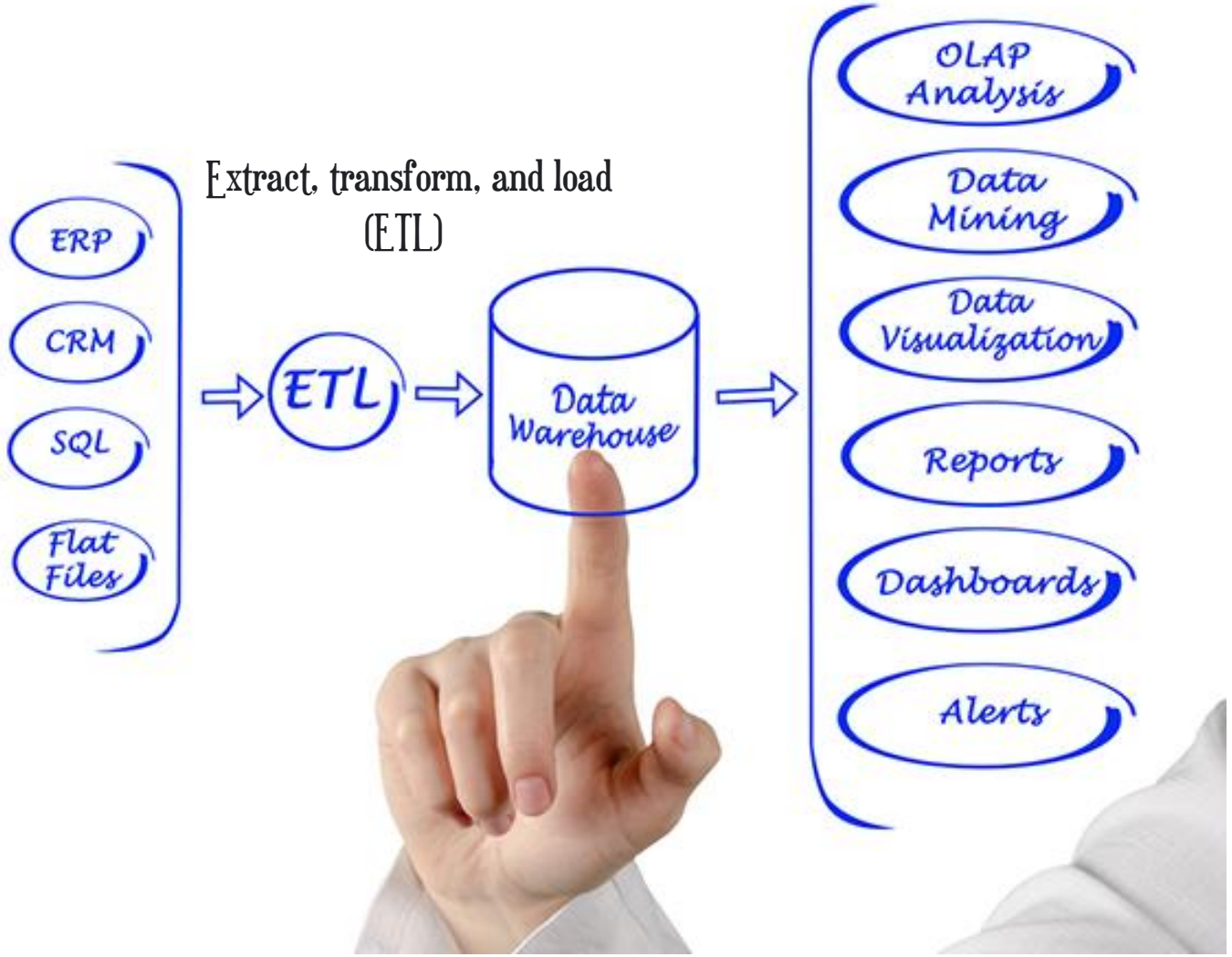
UNIT I : INTRODUCTION

Topic 3 : Three-schema architecture of DBMS, Components of DBMS

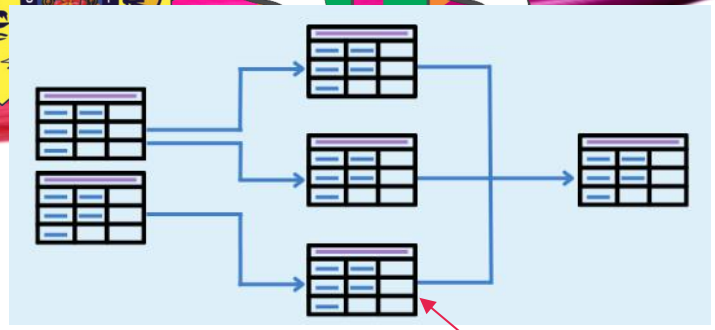
Purpose of Database System - Views of data – Data models, Database Management system - Three-schema architecture of DBMS, Components of DBMS. Entity –Relationship Model - Conceptual data modeling - motivation, entities, entity types, attributes, relationships, relationship types, E/R diagram notations,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

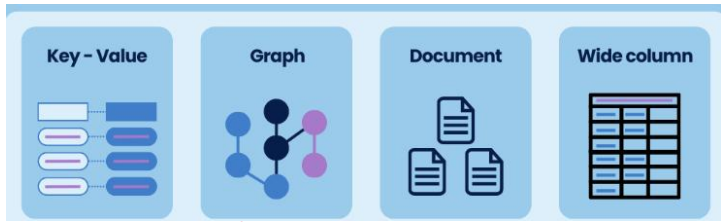
Recap

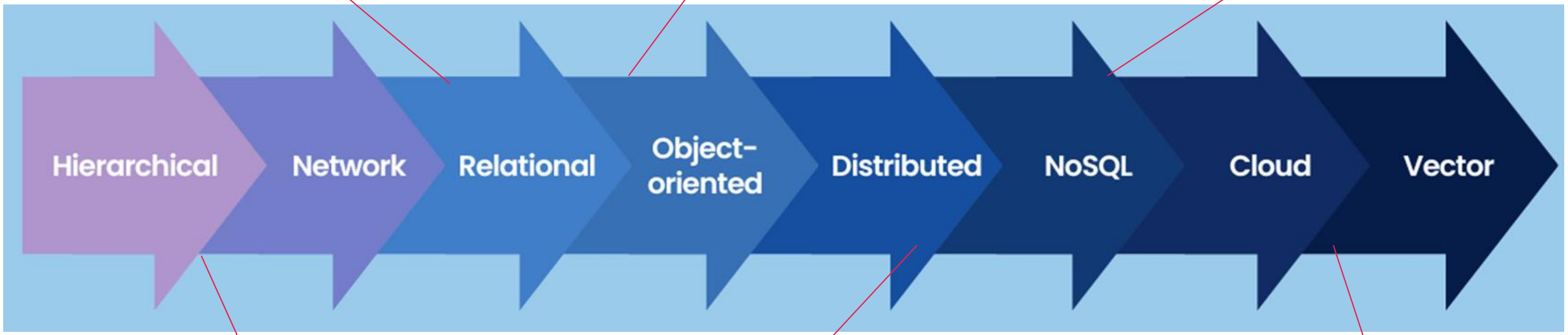


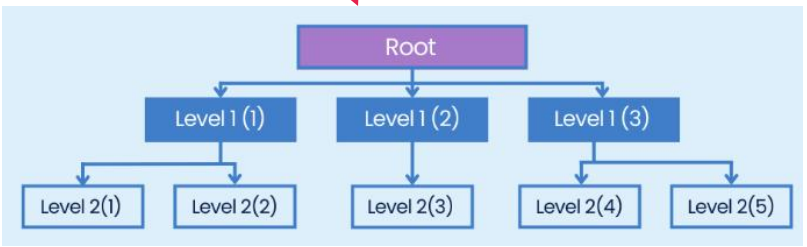

Extract, transform, and load
(ETL)
ERP
CRM
SQL
Flat Files
ETL
Data Warehouse
OLAP Analysis
Data Mining
Data Visualization
Reports
Dashboards
Alerts

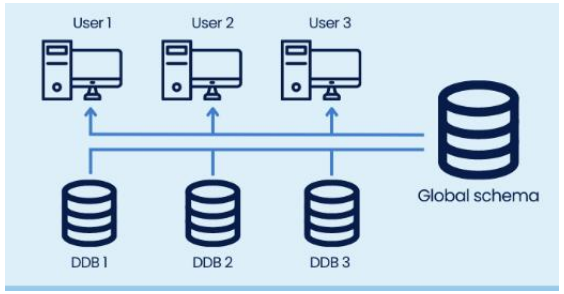
Historv of Database Systems

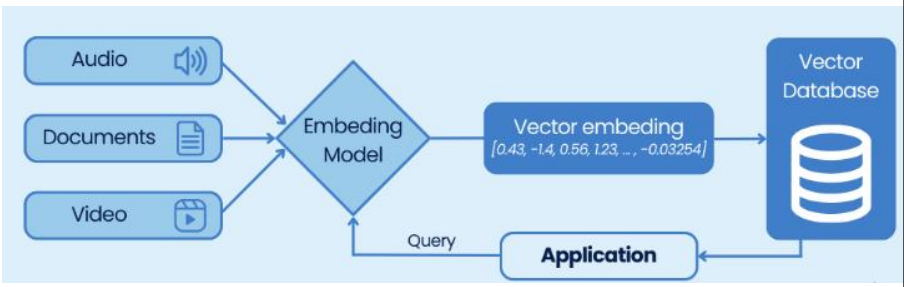












History of Database Systems

Relational Database

Office Database

SQL

(Structured Query Language)

EMPLOYEE			
ID	NAME	AGE	MANAGER_ID
E101	Libinus Xavier	37	M123
E102	Gautham Bhonsle	35	M555
E103	Aravind	45	M404
E104	Shazil	28	M800
E105	Manisha Shah	34	M555

MANAGER		
ID	NAME	DEPT_ID
M123	Ravindranadh	D1011
M404	Shripad Karambelkar	D1011
M555	Meenu Dutta	D2022
M800	James Xavier	D1099
M999	Ibrahim Sheik	D1099

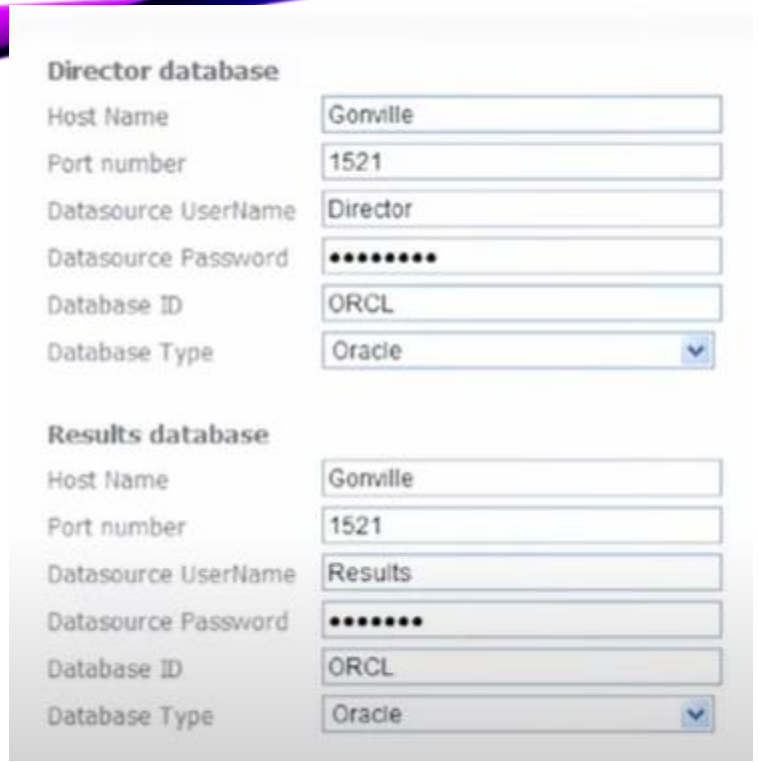
DEPARTMENT			
ID	NAME	DESCRIPTION	LOCATION
D1011	FINANCE	Finance Operations	Mumbai
D1099	HR	Human Resource	Bangalore
D2022	IT	Information Technology	Bangalore
D3033	ADMIN	Administrative Operations	Bangalore

Oracle Microsoft SQL Server MySQL PostgreSQL

Non Relational Database

Key Value Database:

KEY	VALUE
Employee_ID	EMP_1002398_C1
Status	Active
Salary	25000
Joining_Date	17-Feb-2016
Details	{ "Location": "New York", "Project": "NewStore", "Skills": ["SQL", "Python"] }



Non Relational Database

Document Database:

MongoDB, CouchDB etc...

ID: iPad

```
{
    "Type": "Tablet",
    "Manufacturer": "Apple",
    "Apps": [
      "Safari",
      "FaceTime"
    ]
}
```

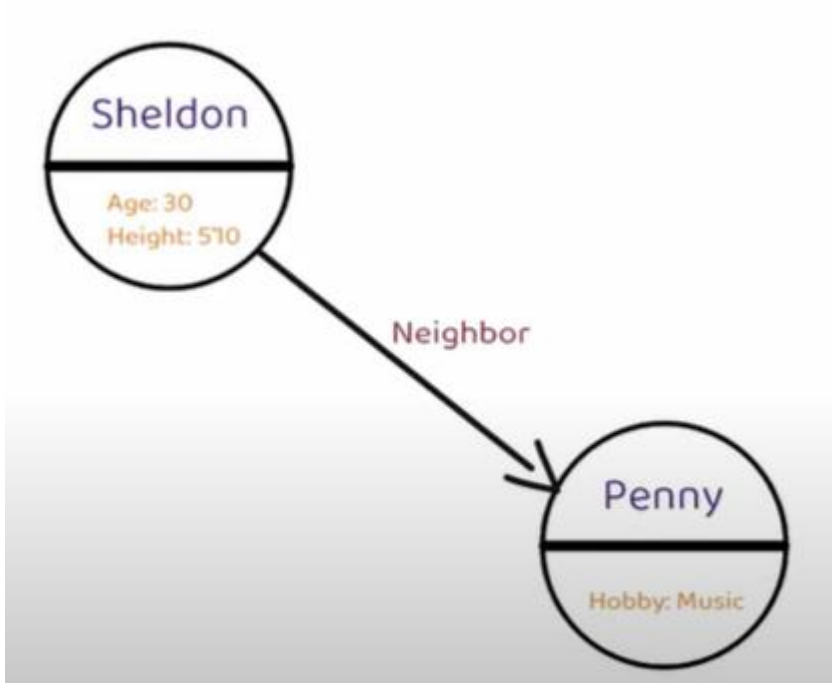
ID: MacBook Pro

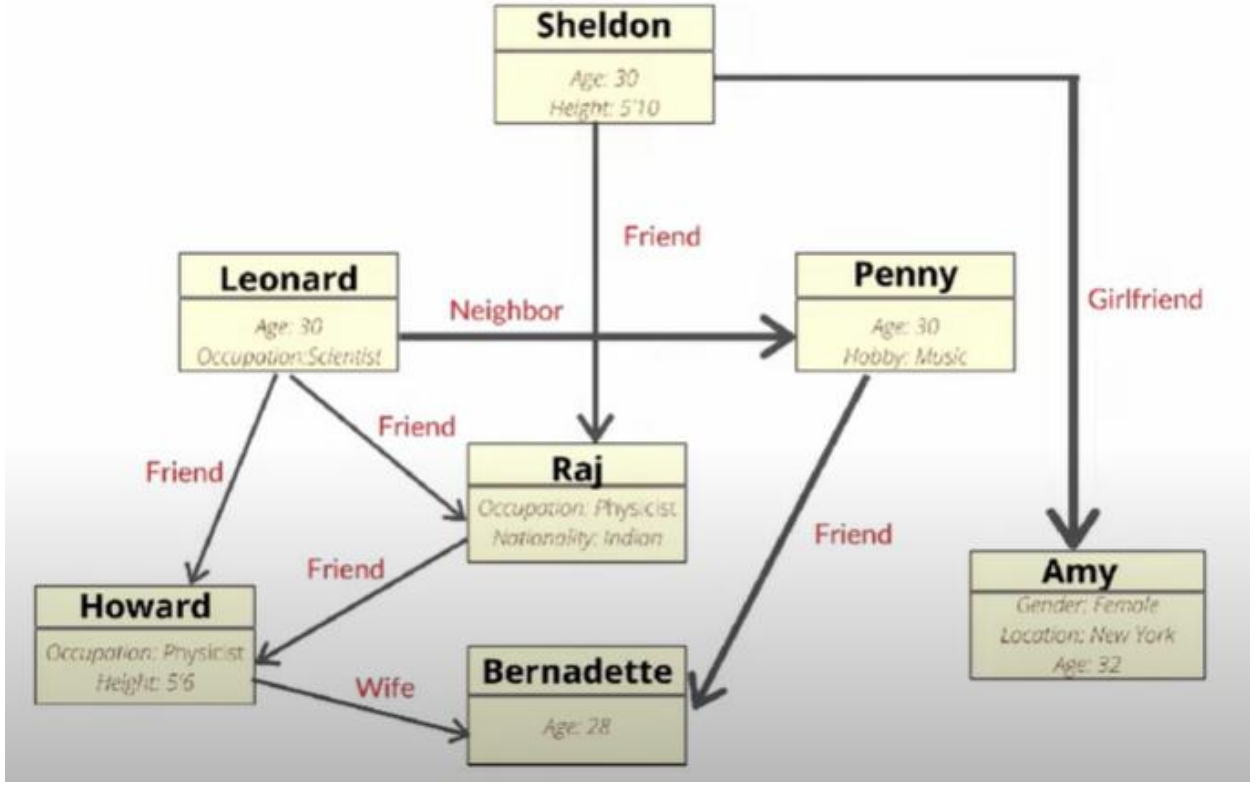
```
{
    "Type": "Laptop",
    "Colour": "Space Grey",
    "Processor": [
        "Intel i5",
        "Quad core",
        "10th generation",
        "2.0GHz",
        "Turbo": [
            "Turbo Boost upto 3.8+GHz",
            "6MB shared L3 cache",
        ],
    ],
    "price": "RM 8,799",
    "Manufacturer": "Apple",
    "Display": [
        "13.3-inch",
        "2560x1600 resolution",
        "227 pixels per inch",
        "500 nits brightness"
    ],
    "Memory": "16 GB LPDDR4X",
    "Graphics": "Intel Iris Plus Graphics"
}
```

ID: iPhone

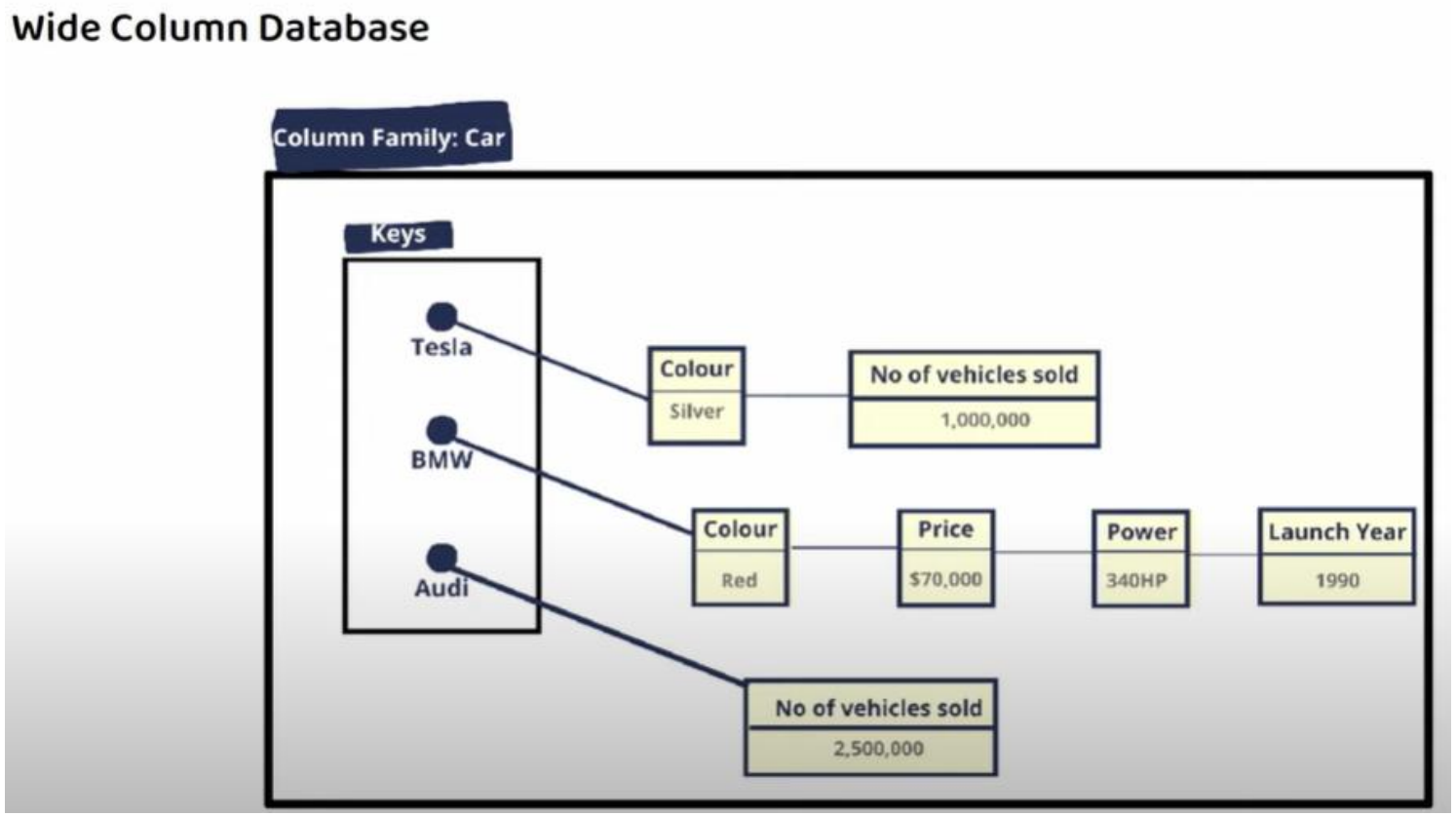
```
{
    "Type": "Phone",
    "Colour": "Green",
    "Camera": [
      "Dual 12MP Ultra Wide",
      "Wide: f/1.8 aperture",
      "2x optical zoom",
      "Night mode"
    ],
    "price": "RM 3,500",
    "Capacity": "64 GB"
    "Chip": "A13 Bionic chip"
}
```

Non Relational Database





Non Relational Database

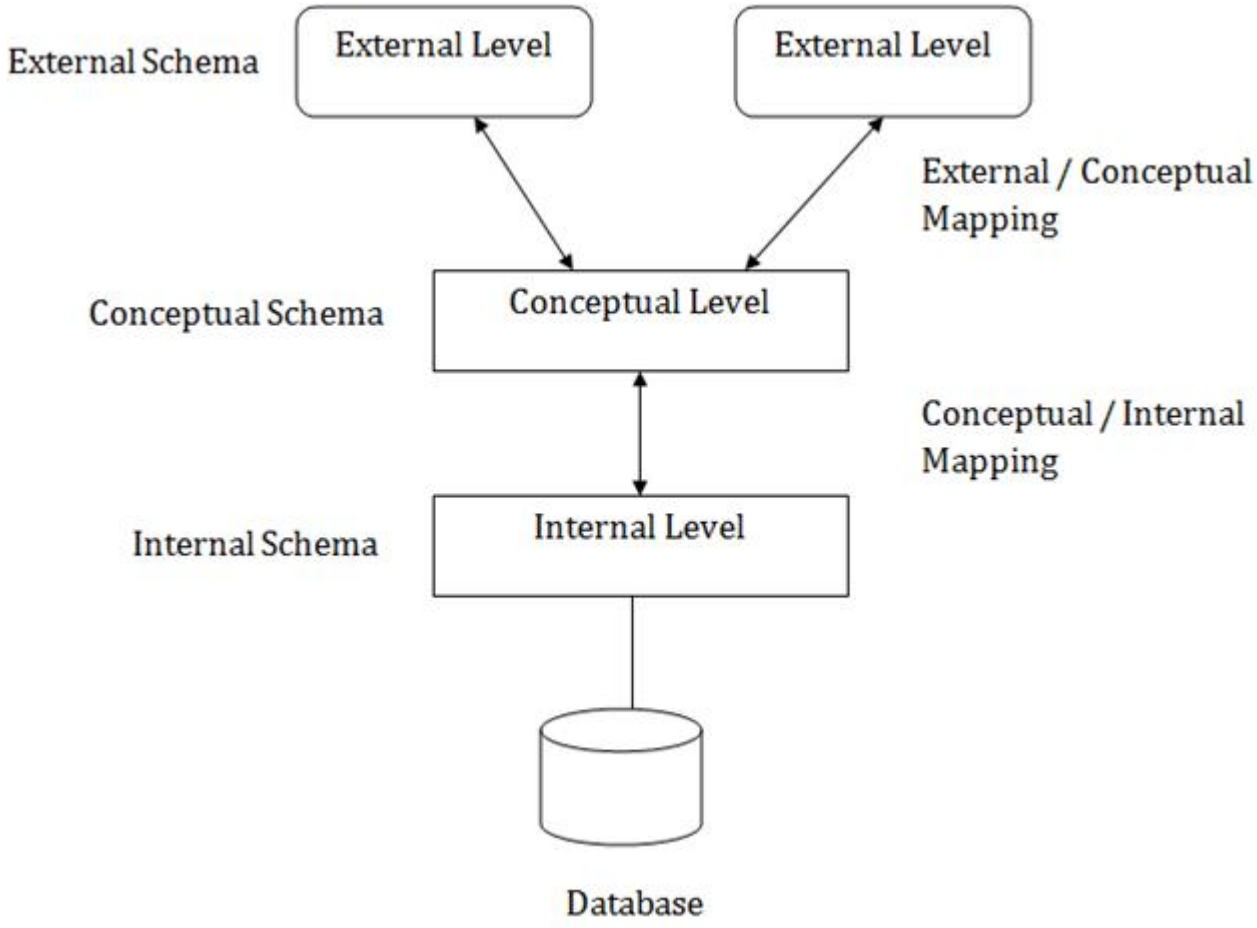


DBMS in Future

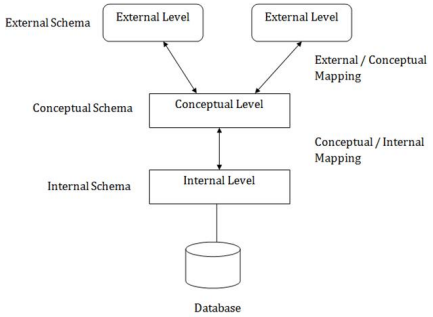
DBMS with artificial intelligence (AI) and machine learning (ML), and the rise of decentralized technologies such as blockchain.

Integration of DBMS with AI and ML brings intelligent data processing, predictive analytics, and automated decision making

Three-schema architecture of DBMS



Three-schema architecture of DBMS



Global view

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

Internal view

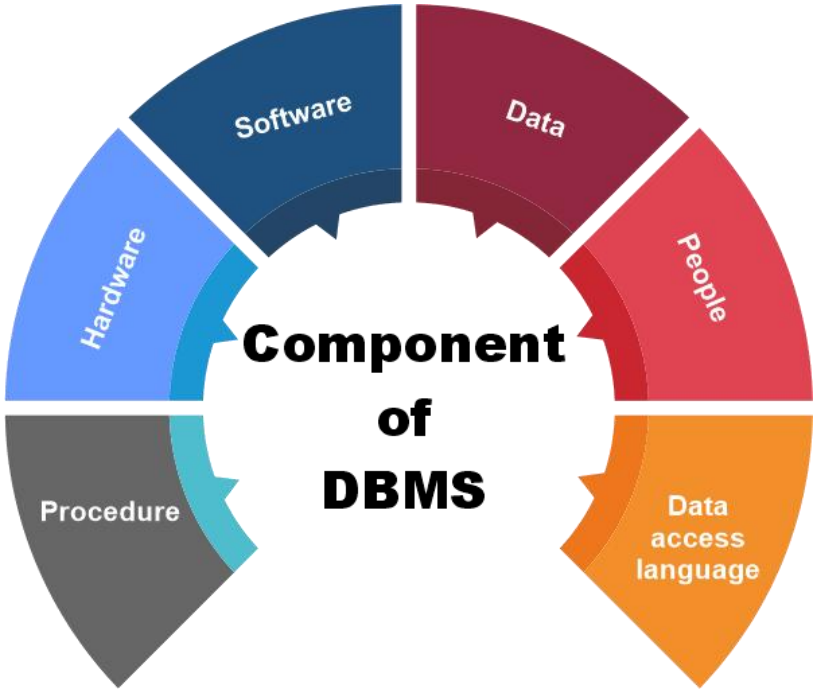
STORED_EMPLOYEE record length 60	
Empno	: 4 decimal offset 0 unique
Ename	: String length 15 offset 4
Salary	: 8,2 decimal offset 19
Deptno	: 4 decimal offset 27
Post	: string length 15 offset 31

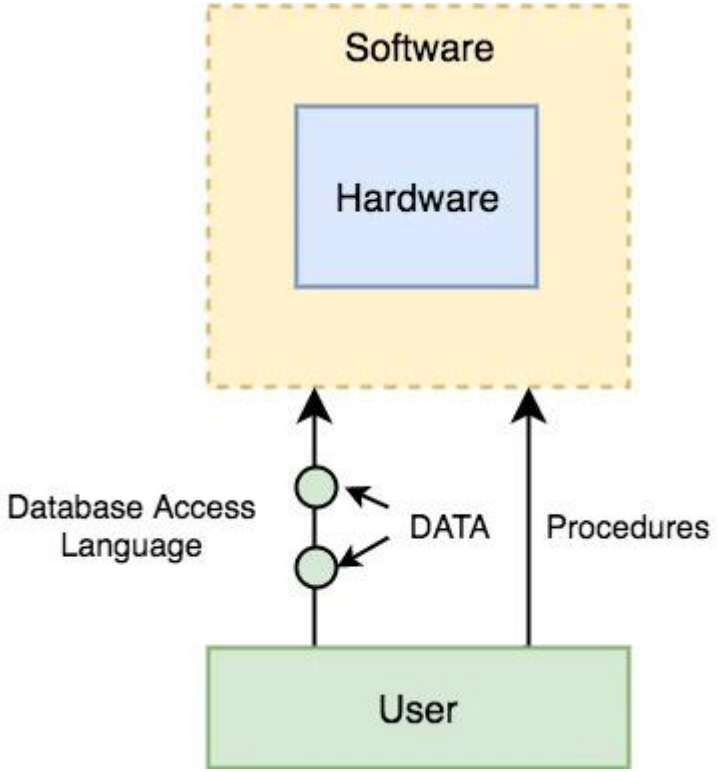
External View

Empno	Ename

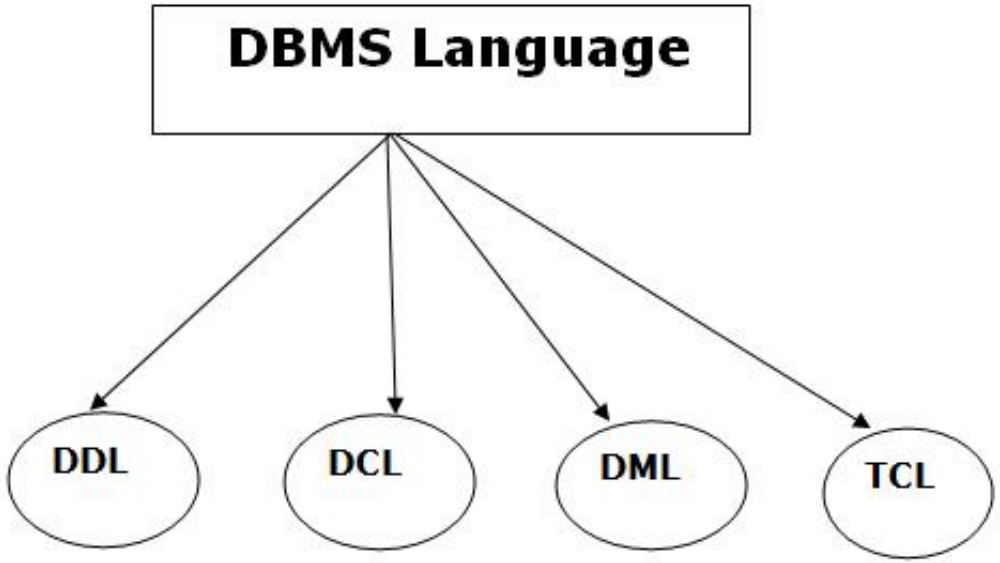
Empno	Ename	Salary	DeptNo

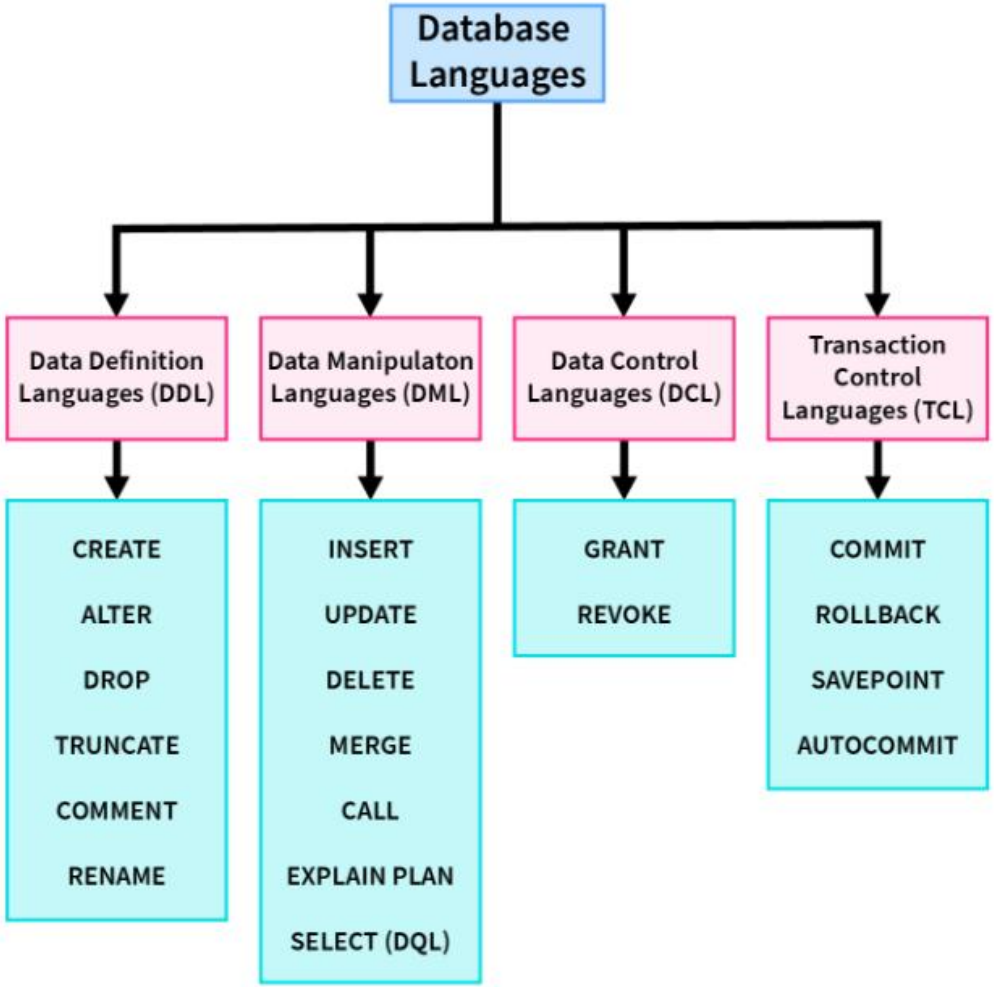
Components of DBMS





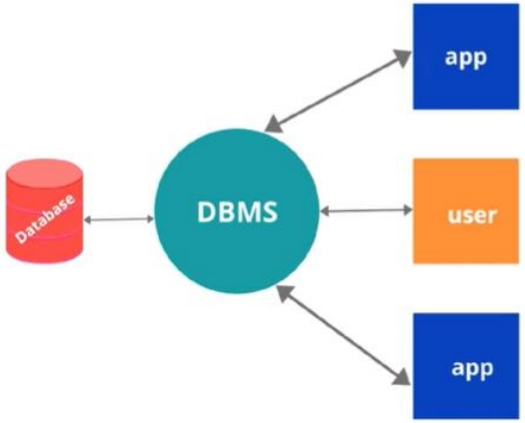
Types of Database Languages





Summary

DBMS ≠ DATABASE ?



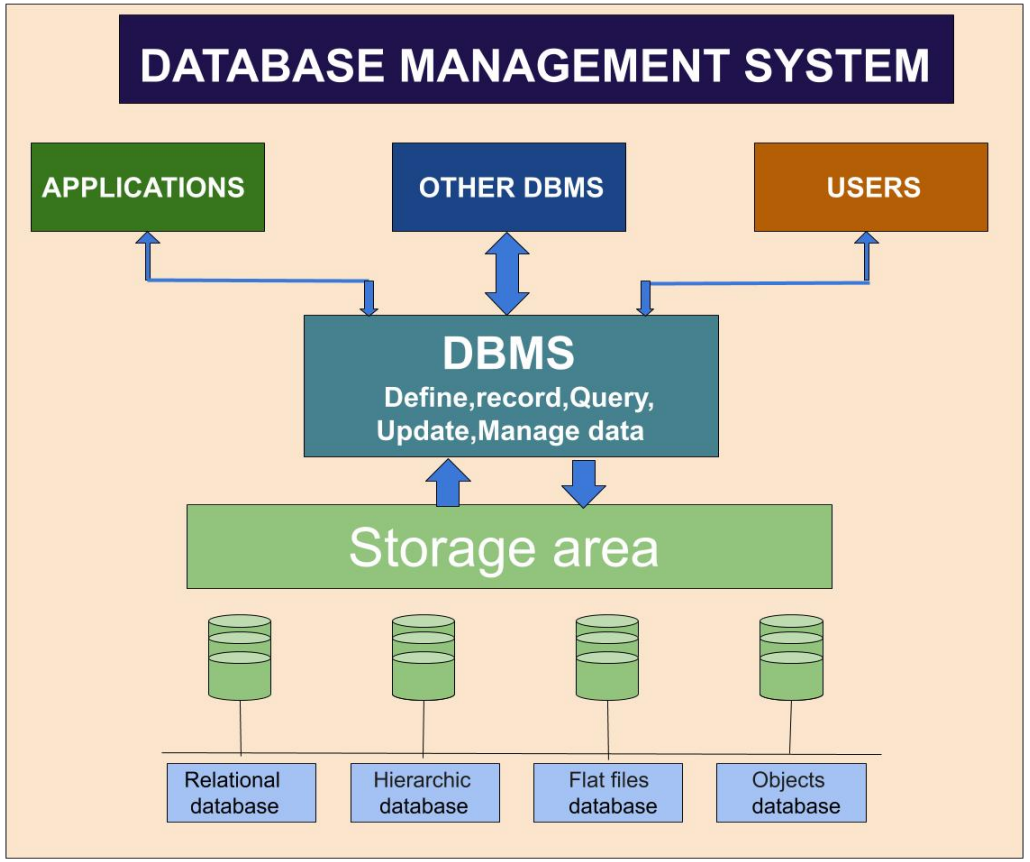
MySQL

PostgreSQL

MongoDB

Neo4j

Cassandra



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Abraham Silberschatz, Henry F. Korth, S. Sudharshan, —Database System Concepts, Sixth Edition, Tata McGraw Hill, 2011.

RamezElmasri, Shamkant B. Navathe, —Fundamentals of Database Systems ,Sixth Edition, Pearson Education, 2011.

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