FEATURE

Flat File System

Structure	Data Redundancy	Relationships	Example Usage	Drawbacks
Stores data in plain text files	High redundancy	None or manual linking	CSV files, logs	Difficult to scale & maintain

FEATURE

Relational Database

Structure	Data Redundancy	Relationships	Example Usage	Drawbacks
Uses tables (rows & columns)	Low, thanks to normalization	Foreign keys and joins manage relationships	MySQL, PostgreSQL, SQL Server	MySQL, PostgreSQL, SQL Server

DBMS ADVANTAGES

Security

Access control , encryption

Integrity

Data accuracy and consistency

Backup

Automated and manual backup options

Redundancy

Reduced with normalization

Concurrency

Multiple users accessing data safely

Data Sharing

Shared access with permission levels

ROLES IN A DATABASE SYSTEM

System Analyst

Gathers user requirements, designs high-level solutions, acts as a bridge between users and developers.

Database Designer

Designs the schema, selects data types, normalization, entity-relationship modeling.

Database Developer

Implements the database structure, writes queries, stored procedures, and optimizes performance.

Database Administrator (DBA)

Manages backups, restores, security, tuning, and user access. Ensures data availability.

Application Developer

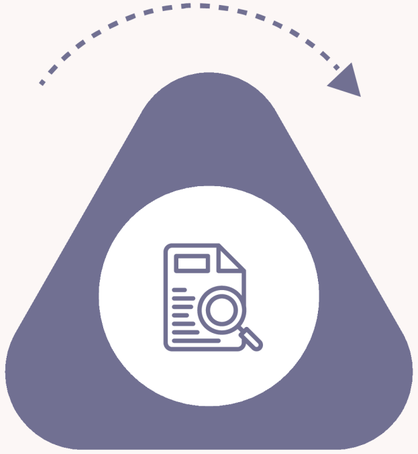
Builds applications that interact with the database (front-end/back-end). Uses APIs and SQL queries.

BI Developer

Designs dashboards, analytics, and reports. Transforms raw data into business insights.

TYPES OF DATABASES

Relational



Example

MySQL,
PostgreSQL,
Oracle

Description

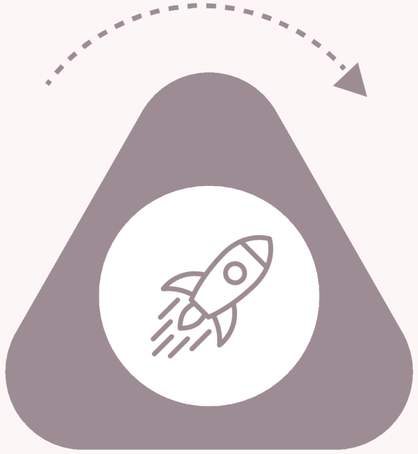
Structured tables with schema. SQL used.

Use Cases : Banking, ERP, CRM

Non-Relational Databases

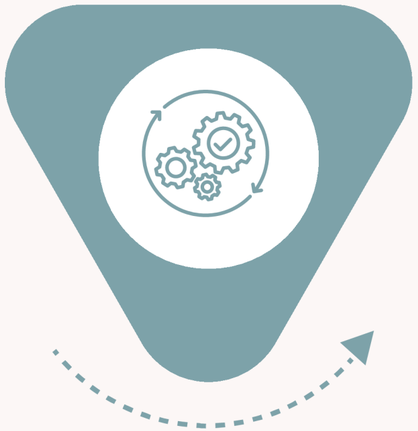
Example

MongoDB,
Cassandra,
Redis



Description

Flexible schema, stores data as documents, key-value pairs, etc.



Use Cases: IoT, content management, real-time analytics

CENTRALIZED VS. DISTRIBUTED VS. CLOUD DATABASES

All data is stored on a single server.

Small organizations, internal tools.

Data is distributed across multiple nodes/locations.

Global apps, high availability.

Hosted on platforms like AWS, Azure, GCP. Offers managed services

SaaS apps, scalable web apps, startups.

CLOUD STORAGE AND DATABASES

What is Cloud Storage?

Cloud storage allows data to be stored on remote servers accessed via the internet. It supports database functionality by offering scalable, reliable, and redundant storage infrastructure.