Introduction to Databases — Page 2

How a database system works and the main types of databases.

Components of a database system

A database runs on a **server** (often in the **cloud**) and can be available 24/7. The **database** itself stores the data. The **DBMS** (Database Management System) manages the database: it receives requests, reads and writes data, and returns results. Users, applications (web or desktop), and tools like Power BI send **SQL** to the DBMS to query or update the data.

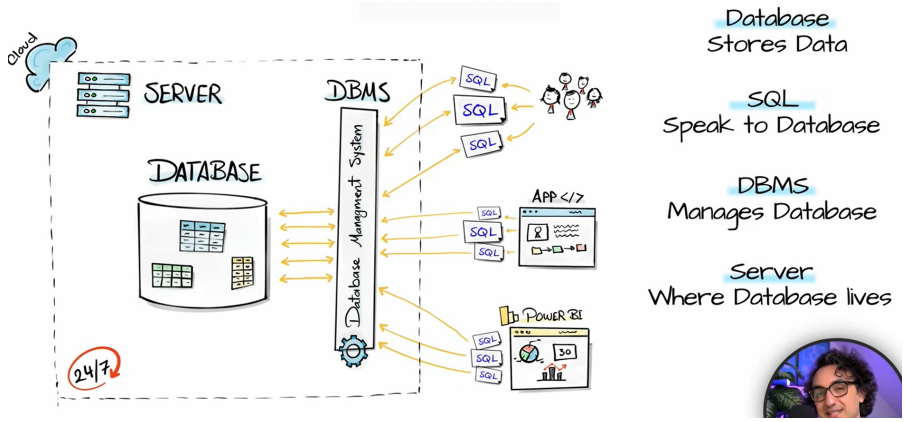

Fig. 1 — Cloud, server, database, and DBMS. Users, apps, and Power BI speak to the database using SQL. Definitions: Database = stores data; SQL = speak to database; DBMS = manages database; Server = where database lives.

Types of databases

Databases come in several main types, each suited to different kinds of data and queries: **Document** (e.g. MongoDB) for flexible, document-shaped data; **Relational** (e.g. Microsoft SQL Server, MySQL, PostgreSQL) for tables and relationships; **Graph** (e.g. Neo4j) for networks of connected entities; **Column-based** (e.g. Apache Cassandra, Amazon Redshift) for analytics; **Key-value** (e.g. Redis, Amazon DynamoDB) for simple key-value lookups.

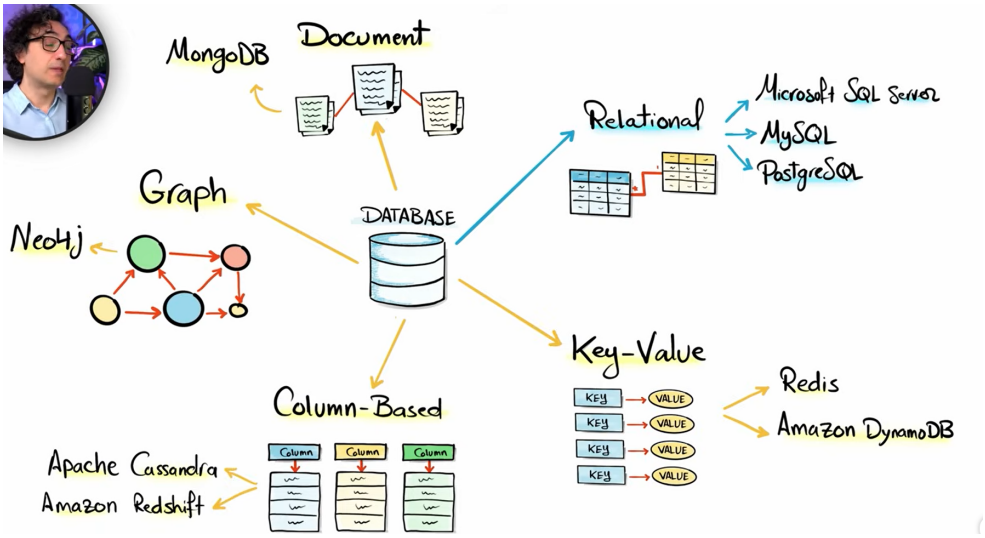

Fig. 2 — Main database types: Document, Relational, Graph, Column-based, and Key-value, with common examples.