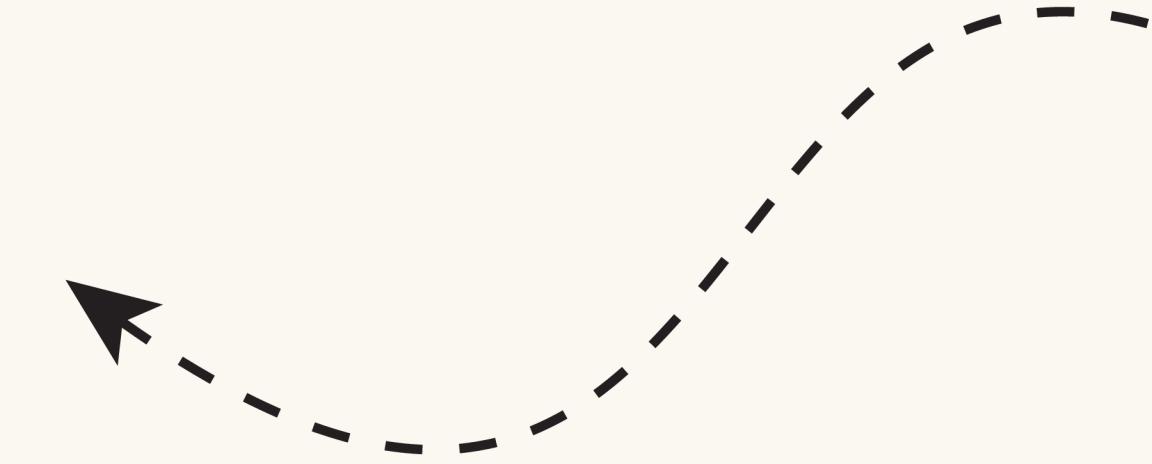


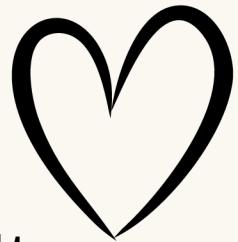
Databases REPORT



Agenda

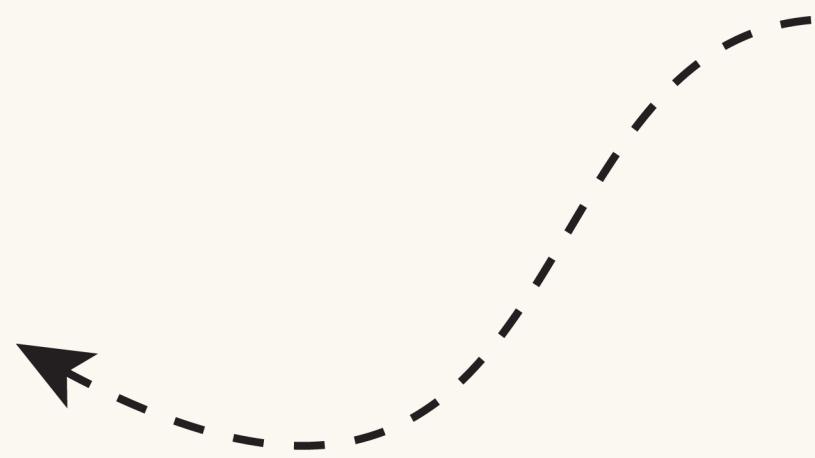
- 1- Introduction
- 2- Flat File vs. Relational Databases
- 3- DBMS Advantages – Mind Map
- 4- Roles in a Database System
- 5- Types of Databases
- 6- Cloud Storage and Databases
- 7- Submission Checklist

Introduction



A database is an organized collection of data that allows easy access, management, and updating. It is widely used in systems like banking, education, and online platforms to store and process information efficiently.

This report provides a structured overview of fundamental database concepts. It covers comparisons between flat file and relational databases, visualizes DBMS advantages, defines key roles in database development, and explores different types of databases including cloud-based solutions. The goal is to develop research and reporting skills while documenting insights in a clear, professional format.

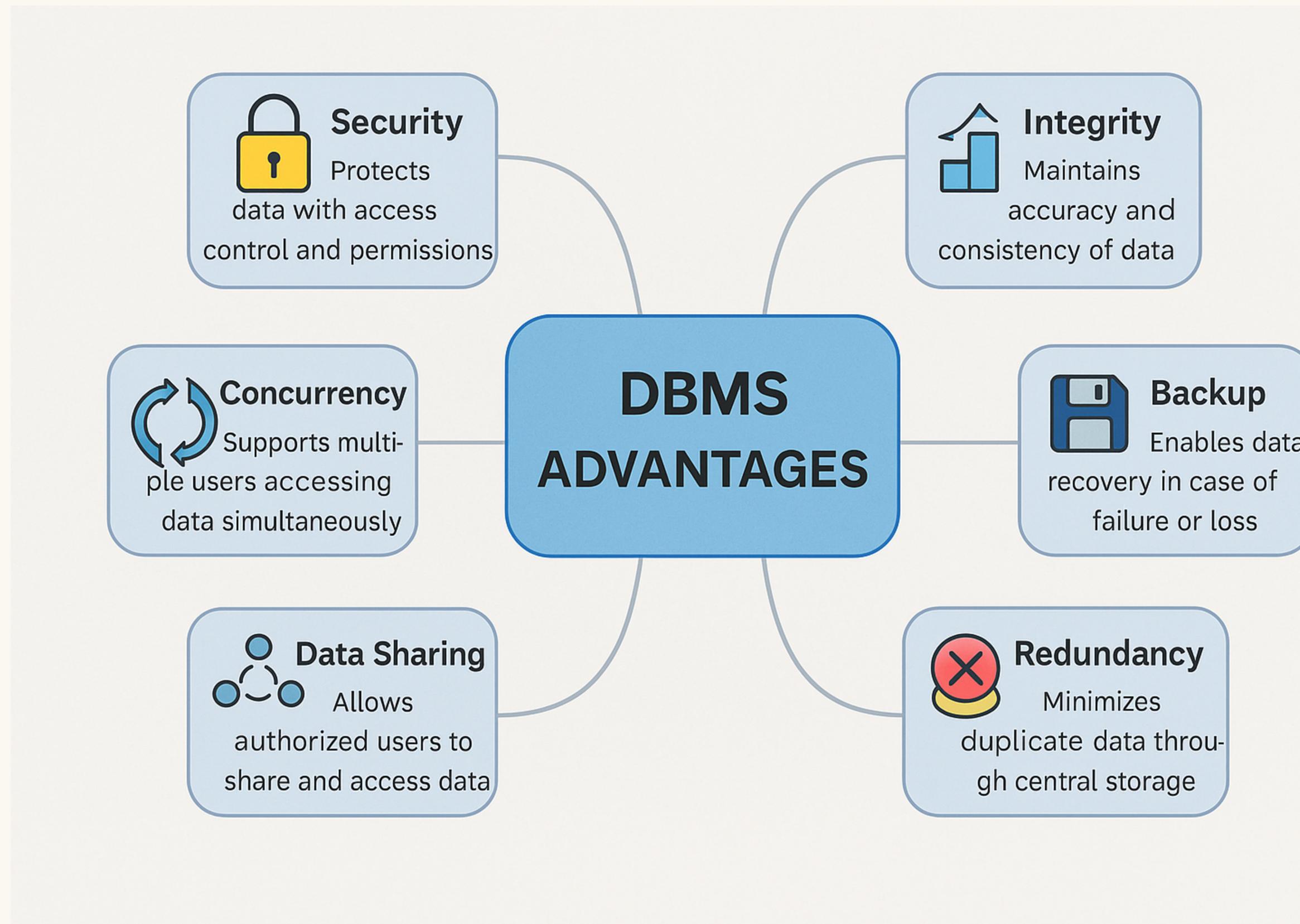


Task I: Flat File Systems vs. Relational Databases

The table below shows a comparison between Flat File Systems and Relational Databases:

Feature	Flat File System	Relational Database System
Structure	Simple text files (e.g., CSV, TXT)	Organized in tables with rows and columns
Redundancy	High redundancy (data often repeated)	Low redundancy using normalization and keys
Relationships	No relationships between files	Tables are related using foreign keys
Example Usage	Simple logs, contact lists	Banking systems, e-commerce, schools
Drawbacks	Difficult to update, insecure, error-prone	More complex setup and requires DBMS

Task 2: DBMS Advantages – Mind Map



TASK 3: ROLES IN A DATABASE SYSTEM:

- · SYSTEM ANALYST: COLLECTS REQUIREMENTS, WRITES SYSTEM DOCUMENTATION.
- · DATABASE DESIGNER: CREATES DATABASE SCHEMA & ERD BASED ON SYSTEM NEEDS.
- · DATABASE DEVELOPER: IMPLEMENTS THE DATABASE, WRITES SQL SCRIPTS.
- · DATABASE ADMINISTRATOR (DBA): MANAGES SECURITY, BACKUPS, TUNING, AND MAINTENANCE.
- · APPLICATION DEVELOPER: CONNECTS FRONTEND/BACKEND TO DATABASE VIA APIs.
- · BI DEVELOPER: BUILDS REPORTS, DASHBOARDS, AND PERFORMS DATA ANALYTICS USING TOOLS LIKE ML.

TASK 4: TYPES OF DATABASES

RELATIONAL DATABASES USE STRUCTURED TABLES WITH DEFINED RELATIONSHIPS (E.G., MYSQL, POSTGRESQL).

NON-RELATIONAL DATABASES USE FLEXIBLE STRUCTURES SUCH AS DOCUMENTS OR KEY-VALUE PAIRS (E.G., MONGODB, CASSANDRA).

COMPARISON OF CENTRALIZED, DISTRIBUTED, AND CLOUD DATABASES:

Type	Description	Use Case Example
Centralized	All data in one location	School database on a local server
Distributed	Data spread across multiple servers	International bank branches
Cloud	Hosted on cloud providers (AWS, Azure, etc.)	Netflix, Zoom, Google services

Task 5: Cloud Storage and Databases:

Cloud storage refers to internet-based data storage systems that allow scalable access and management.

It supports databases by enabling remote access, backups, and scalability.

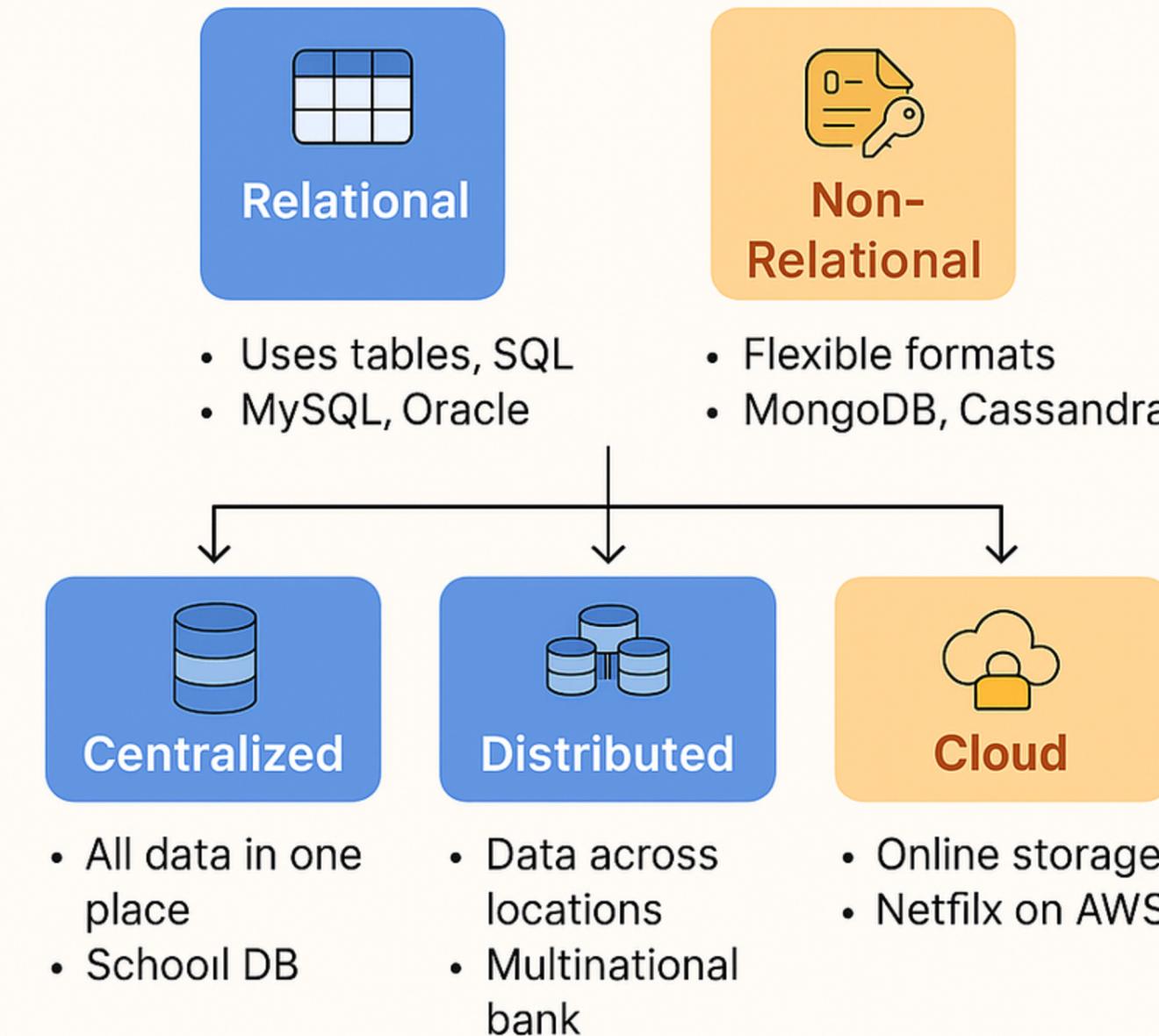
Advantages of cloud-based databases include:

- No need for physical hardware 
- Scalable and flexible 
- Easy backups and disaster recovery 

Disadvantages of cloud-based databases include:

- Internet dependency 
- Possible higher costs 
- Security and compliance concerns 

Types of Databases



Cloud Storage & Databases

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Benefits | Challenges |
| <ul style="list-style-type: none">• Scalable• Automatic backups• Accessible globally• No hardware needed | <ul style="list-style-type: none">• Needs internet• Security risks• Vendor lock-in• Can be costly over time |

Amazon RDS, Azure SQL,
Google Cloud SQL

THANK YOU!

