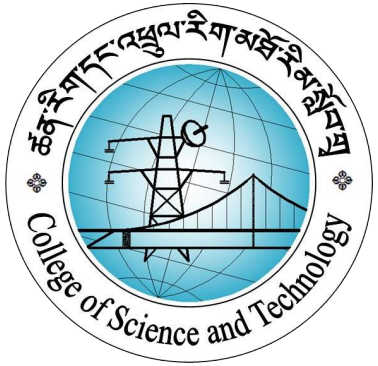


Royal University of Bhutan

DBS101 Database Systems Fundamentals

Lesson 1

Learning Outcomes

1. Understand the purpose of database systems.
2. Identify the use of database system applications in various industries.
3. Understand the evolution of database systems.

What is a Database?

https://padlet.com/paldenongmocst/what-is-a-database-ab8x9dsb4g6yb6k1

Data, Database and Database System

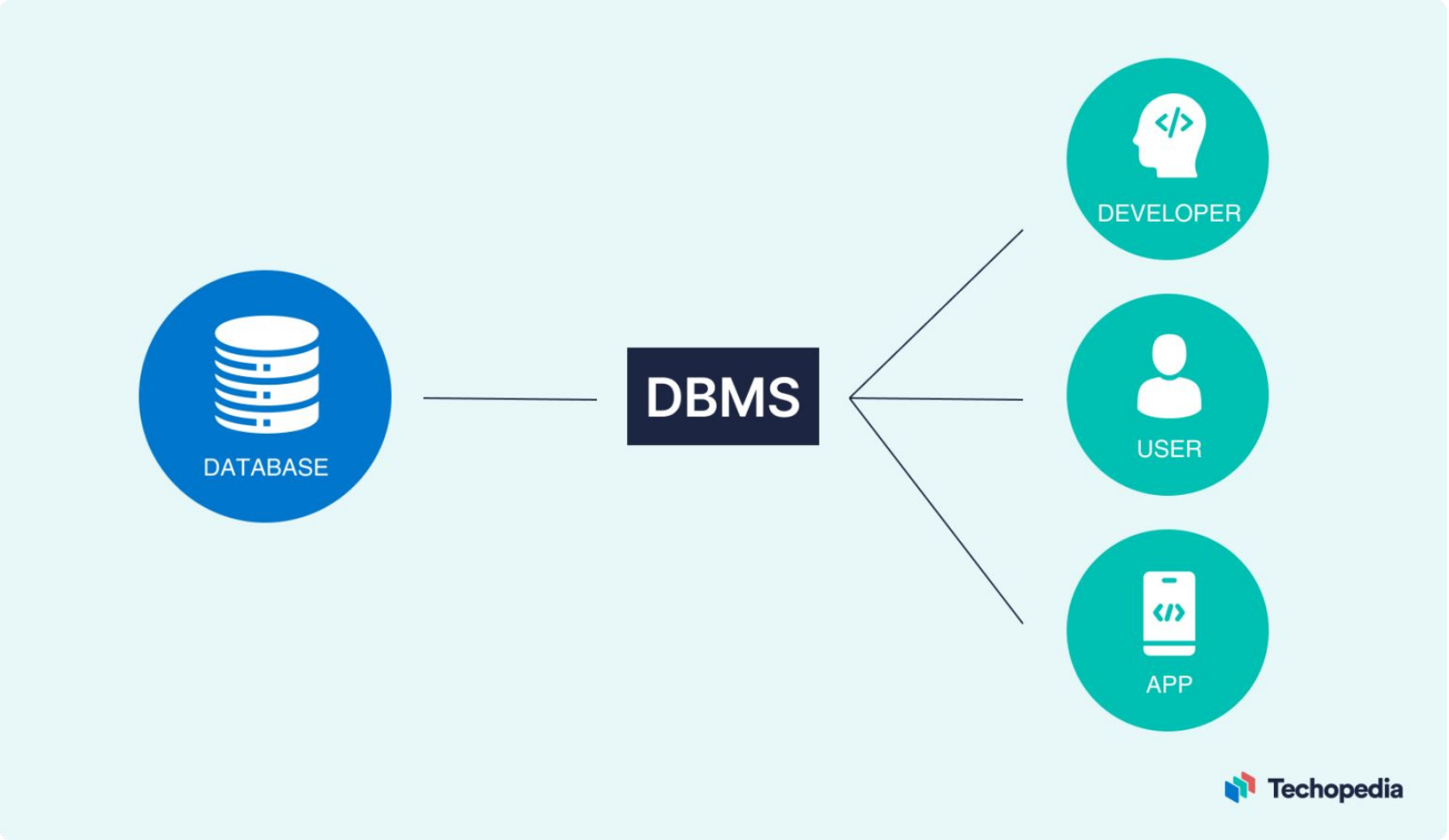
Data - Collection of facts.

Database - A database is an organized collection of structured information, or data, typically stored electronically in a computer system.

Database Management System - is a collection of interrelated data and a set of programs to access those data.

Database + Database Management System = Database Systems

Database Systems



Why do we need Database Systems?

Let's take a look at one of our college processes like registration for a new semester.

Typical processes

1. College asks for students to fill out a physical form.
2. Students deposit tuition fee into college account.
3. All records like jrnl number of bank payment and student data is stored on different excel sheets on the record keeper's computer.
4. Receipts and student forms are stored physically.

Is this process is efficient?

List advantages if you agree.

List areas of improvement if you disagree.

Disadvantages of file-processing systems

- Data redundancy and inconsistency
- Difficulty in accessing data
- Data isolation
- Integrity problems
- Atomicity problems:
    - Concurrent-access anomalies
    - Security problems

Advantages of having a database system applications

- Data consistency
- Scalability and flexibility
- Reduction in data redundancy
- Better security
- Data Abstraction

Database systems are used to manage collections of data that:

- are highly valuable,
- are relatively large, and
- are accessed by multiple users and applications, often at the same time.

Data is the new gold

A database system combines data of various types into a unified repository of information.

Examples of database systems include

- Banking and finance: transaction processing and customer information systems
- Social media
- Sales
- Navigation systems

Etc.

History/Evolution of Database Systems

History of Database Systems

Class Activity(35 mins)

Group Discussion Time - 15 mins

Presentation Time - 5 minutes

- 4 groups

1. Choose a public sector in Bhutan that currently uses or could benefit from using a database management system (DBMS).
2. Outline 3 processes or functions within that public sector that could use or already uses a Database Management system to store, organize, and retrieve data efficiently.

3. Provide 3 points explaining why you chose this particular public sector.

Consider factors like:

a) The volume and variety of data that needs to be tracked
b) The need to share data accurately across departments
c) The need for data analytics, reporting, visualization
d) Proper recordkeeping for audits, evaluations, planning
e) Potential to improve staff productivity, decision making

4. If the public sector you chose already uses a database management system, provide 3 points on how that existing system aids the day-to-day functions and workflows in that sector.

References

Korth, H. F., Sudarshan, S., & Professor, A. S. (2019). *Database System Concepts*. McGraw-Hill Education.

What is a database?. Oracle. (n.d.). *https://www.oracle.com/database/what-is-database/*

Next Lesson

Unit 1: Introduction to Database Systems

1.1 View of Data
1.5 Database Languages
1.6 Database Design
1.7 Database Engine
1.8 Database and Application Architecture
1.9 Database Users and Administrators
-------> **Flipped Class**