

DATABASE

AN OVERVIEW



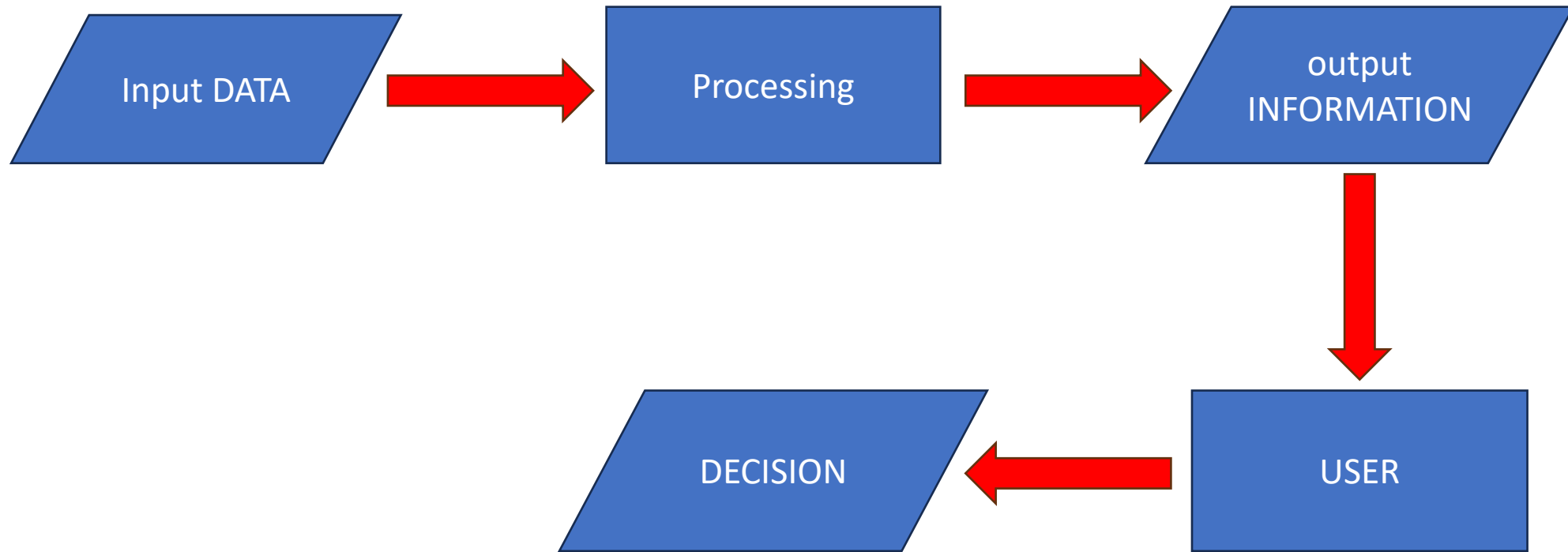
Facts that can be recorded and that have implicit meaning



Processed, organized or summarized data.

- Information is data that have been put into a meaningful and useful content and communicated to a recipient who uses it to made decisions
- Consists of data, images, text, documents and voice, but always in a meaningful content





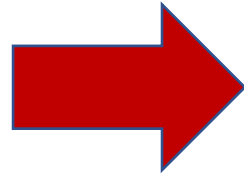


Major key attributes of information

- 1. Accuracy :** Free from errors, bias, clearly and accurately reflects the meaning of data on which it is based and conveys an accurate picture to the recipient.
- 2. Timeliness :** The recipients receive the information when they need it and within the required time frame
- 3. Relevancy :** Usefulness of the piece of information for the corresponding persons, a very subjective matter.



Database



A collection of interrelated data stored together with controlled redundancy to serve one or more applications in an optimal way

A collection of logically related data stored together that is designed to meet information requirements of an organization.

The data are stored in such a way that they are independent of the programs used by the people for accessing the data.





Fields : the smallest unit of the data that has meaning to its users and is also called data item or data element

Examples : Name, Address and Telephone number



Records : a collection of logically related fields and each field is possessing a fixed number of bytes and is of fixed data type

Example : The complete information about a particular phone number in the database represents a record



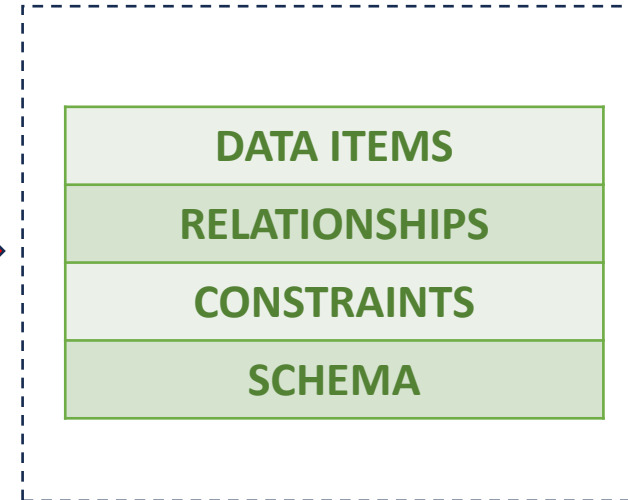
Files : a collection of related records.



Components of a Database

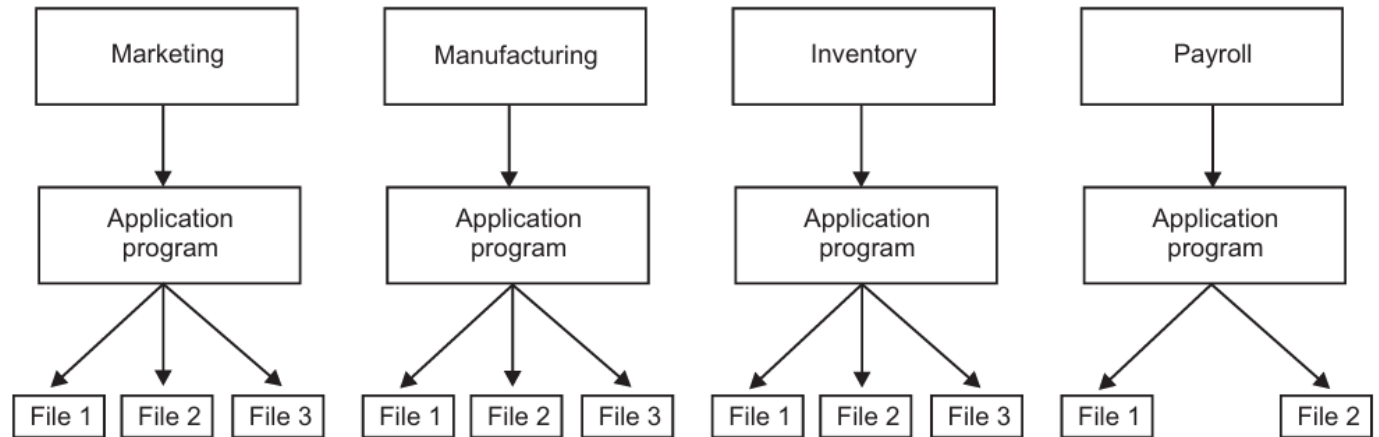


Physical Database



Disadvantages of Traditional File System

1. Data Redundancy
2. Data Inconsistency
3. Lack of Data Integration
4. Program Dependence
5. Data Dependence
6. Limited Data Sharing
7. Poor Data Control
8. Problem of Security
9. Data Manipulation Capability is Inadequate
10. Needs Excessive Programming





Database Management System



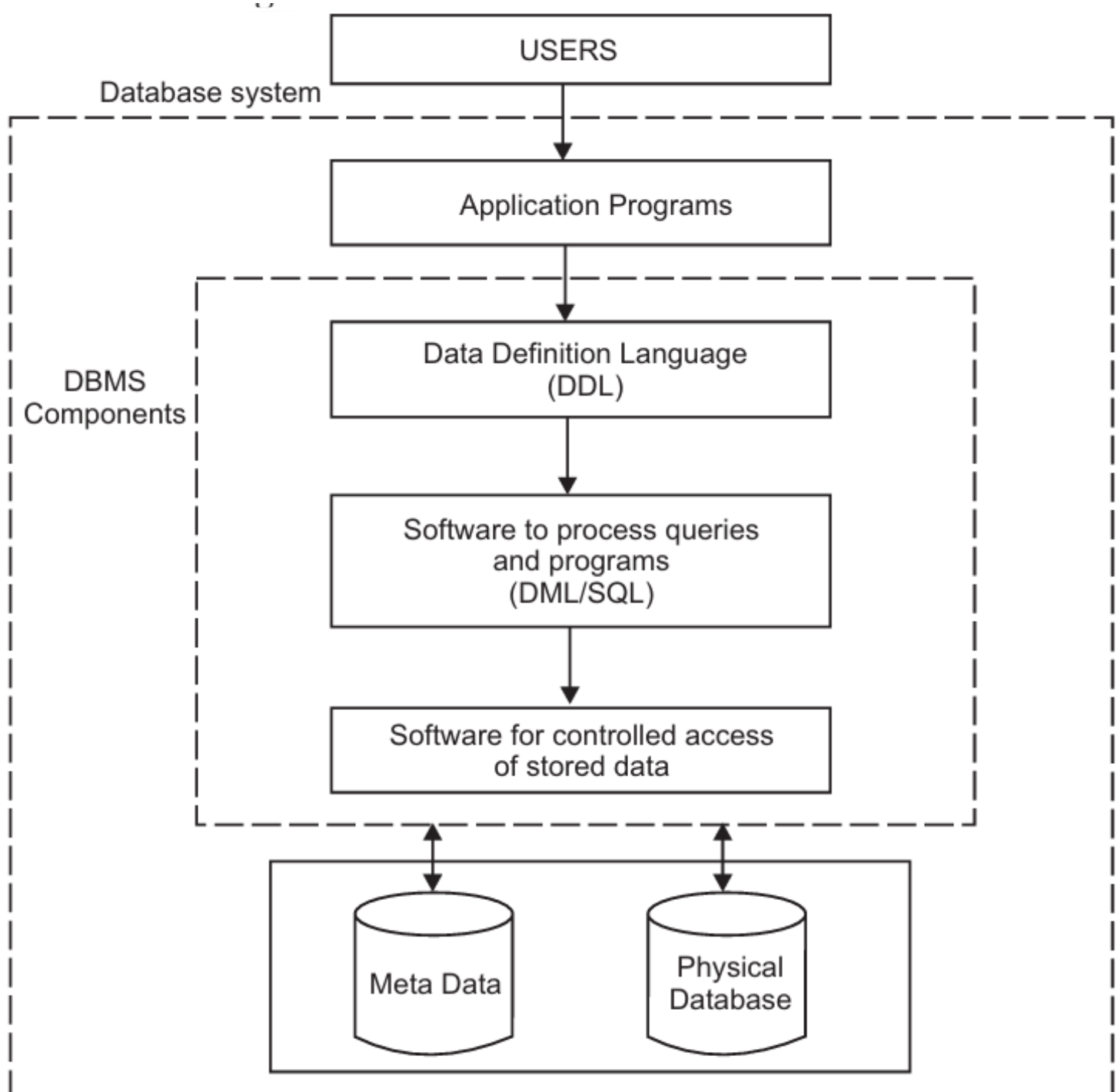
DBMS : A collection of interrelated data and a set of programs to access those data

A computerized system that enables users to create and maintain a database.

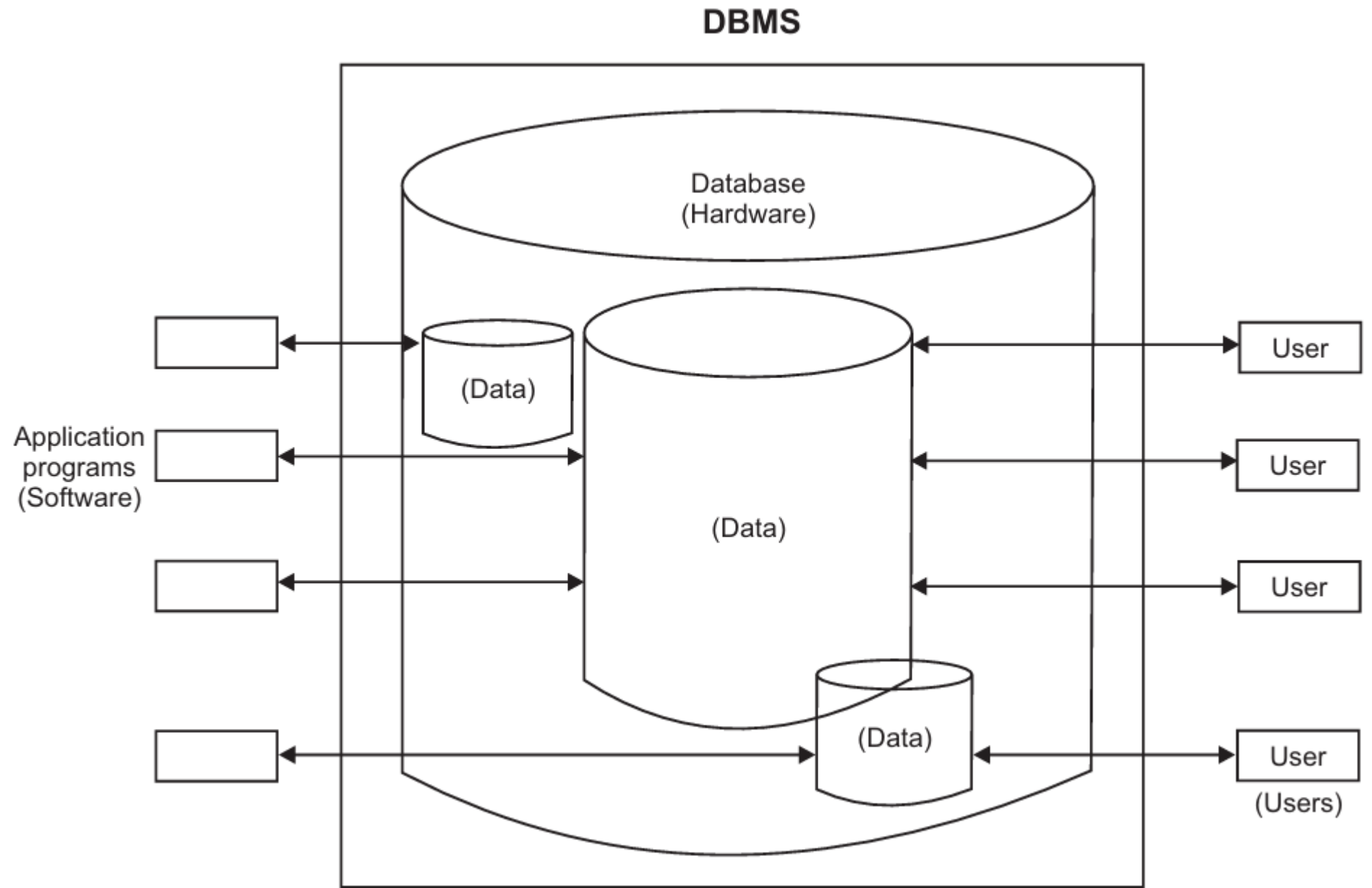
The DBMS is a general-purpose software system that facilitates the processes of defining, constructing, manipulating, and sharing databases among various users and applications



Components of DBMS.

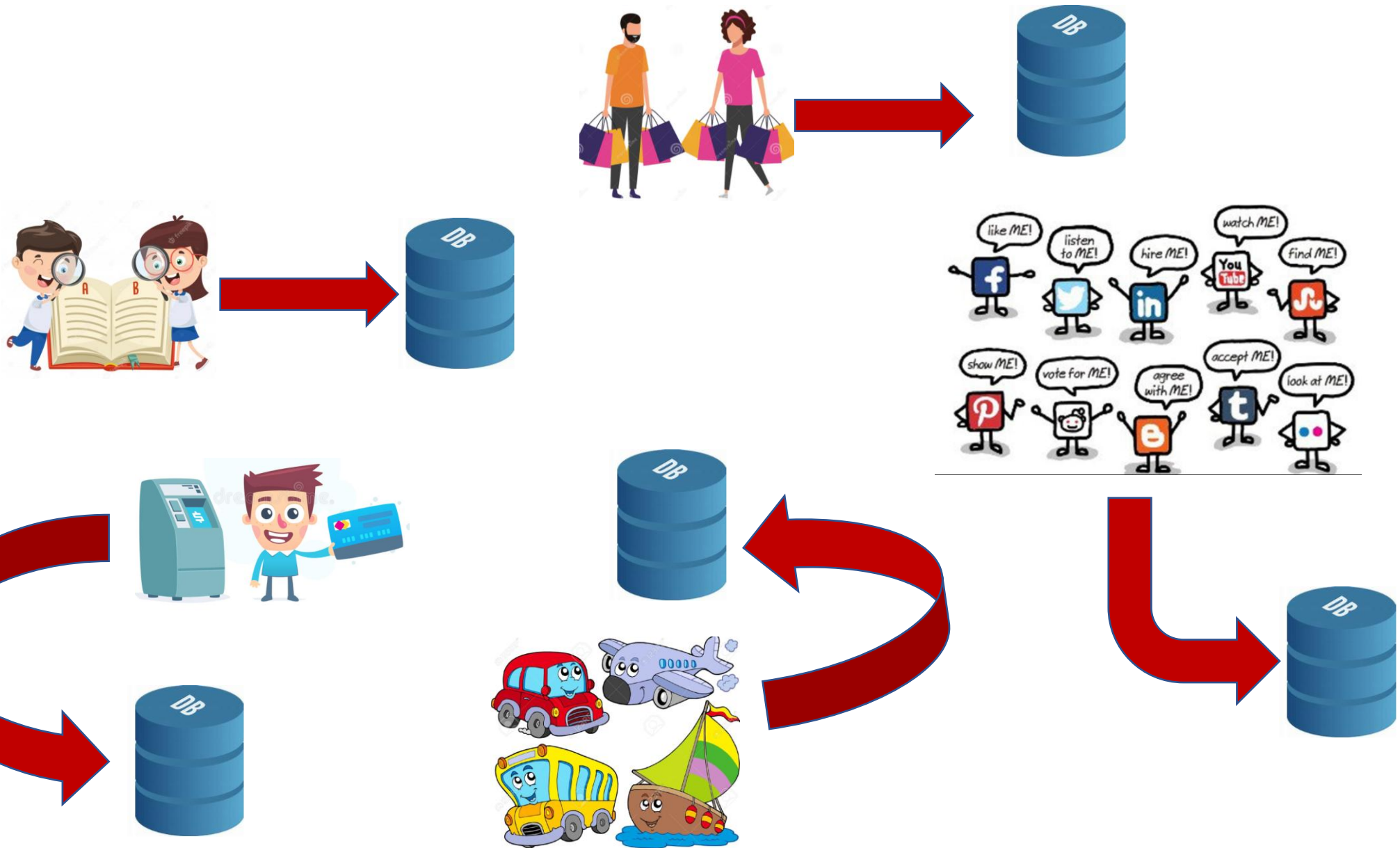


Database system.



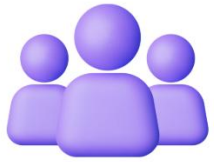
Advantages of Database Systems (DBMS's)

1. Controlled redundancy
2. Data consistency
3. Program data independence
4. Sharing of data
5. Enforcement of standards
6. Improved data integrity
7. Improved security
8. Data access is efficient
9. Conflicting requirements can be balanced
10. Improved backup and recovery facility
11. Minimal program maintenance
12. Data quality is high
13. Good data accessibility and responsiveness
14. Concurrency control
15. Economical to scale
16. Increased programmer productivity



Disadvantages of Database Systems

1. Complexity increases
2. Requirement of more disk space
3. Additional cost of hardware
4. Cost of conversion
5. Need of additional and specialized manpower
6. Need for backup and recovery
7. Organizational conflict
8. More installational and management cost



DBMS users

1. End users or Naive users

use the database system through a menu-oriented application program, where the type and range of response is always displayed on the screen

2. Online users

These type of users communicate with the database directly through an online terminal or indirectly through an application program and user interface.

3. Application Programmers

professional programmers or software developers who develop the application programs or user interfaces for the naive and online users

4. Database Administrator (DBA)

a person who have complete control over database of any enterprise and responsible for overall performance of database

DBA Responsibilities :

1. Deciding the conceptual schema or contents of database
2. Deciding the internal schema of structure of physical storage
3. Deciding users
4. Deciding user view
5. Granting of authorities
6. Deciding constraints
7. Security
8. Monitoring the performance
9. Backup
10. Removal of dump and maintain free space
11. Checks
12. Liaisioning with users



If you work in the information-technology industry, it is essential to understand how data is modeled and stored in a database.



If you work in any other industry, you will most likely have to work with data stored somewhere on a computer and probably be required to use data in your job to create reports and/or make decisions.

Whenever a student, teacher, administrator (or any person using a computer) interacts with a website, pieces of data are collected.



The website application may be unique to that school or company, but what happens in the background?

Question:

What Does a Database Have to do with My Everyday Life?

- Answer: More than you may realize...
- A lot of websites that you visit are driven by a database.



Question:

If You Had One of the Jobs Listed Below, How Might You Use a Database?



Mechanics



Seller/ Buyer



Landscaper

Question:

Have You Ever Returned an Item to a Store Without a Receipt?

- What information did you have to provide?
- Were you able to return the item?



Sales: For customer, product, and purchase information

Accounting: For payments, receipts, account balances, assets, and other accounting information

Human resources: For information about employees, salaries, payroll taxes, and benefits, and for generation of paychecks.

Manufacturing: For management of the supply chain and for tracking production of items in factories, inventories of items in warehouses and stores, and orders for items

Banking and Finance

Banking: For customer information, accounts, loans, and banking transactions.

Credit card transactions: For purchases on credit cards and generation of monthly statements.

Finance: For storing information about holdings, sales, and purchases of financial instruments such as stocks and bonds; also for storing real-time market data to enable online trading by customers and automated trading by the firm.

Universities: For student information, course registrations, and grades (in addition to standard enterprise information such as human resources and accounting).



Airlines: For reservations and schedule information. Airlines were among the first to use databases in a geographically distributed manner.

Telecommunication: For keeping records of calls, texts, and data usage, generating monthly bills, maintaining balances on prepaid calling cards, and storing information about the communication networks.

Web-based services

- ° Social-media: For keeping records of users, connections between users (such as friend/follows information), posts made by users, rating/like information about posts, etc.
- ° Online retailers: For keeping records of sales data and orders as for any retailer, but also for tracking a user's product views, search terms, etc., for the purpose of identifying the best items to recommend to that user.
- ° Online advertisements: For keeping records of click history to enable targeted advertisements, product suggestions, news articles, etc. People access such databases every time they do a web search, make an online purchase, or access a social-networking site.

