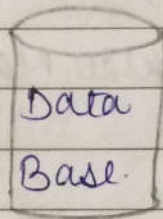


→ Data Base is a organised collection of related data.

→ Data Base Management System:-

is a software tool which allow a user to define, create and manufacture manipulate the data base and provide a controlled accessed to the user.



Eg:- SQL server- microsoft
MySQL server- open source.
Oracle

HADOOP → tools designed to store biometric data.

thumb detection, retina, voice, etc.

→ Applications of Data Base management System.

- Banking system
- Medical/Hospital
- Schools/college/organisation
- Police station
- Telecommunication
- Social media
- Electric Board
- Govt. sector
- Automobile companies.

Data v/s Information

Data → Processing → Information

→ Data
It is an unduganised form of data.

→ It does not convey any meaning.

→ Data is a raw facts and figure in form of words, symbols, characters, etc.

Information
→ It is organised / processed form of data.

→ When data is processed then it convey there meaning.

→ Information is derived from data and it is processed form.



→ It is difficult to understand

→ Information is easy to understand.

→ Data does not help in decision making

→ Information helps to take meaningful decision.

→ Eg:- 50, 20

→ Eg:- Marks 20, Marks 50,

APPROACHES TO ACCESS DATA.

There are two Approaches:-

- File Processing Approach / Traditional file processing system
- Data Base Approach

FILE PROCESSING APPROACH.

- 1) This system stores permanent records in various files and various programmes are to be written to add record in a appropriate files and to extract data from these files.
- 2) It is a collection of application programmes that perform service for end user such as production of reports.
- 3) Each Programme define and manage its own data.

Personnel Department

Accounts Department

Data Entry & Record.

Data Entry & Record.

Application programme.

Application programme.

File definition / File Data Routines

File definition / File data Routines

Files

Files



Limitations

1) Data Redundancy/duplicacy:-

Data duplicacy means when same data is stored at more than one place. due to data redundancy it will consume more space and cause of data Inconsistency.

2) Limited Data sharing:-

It has limited data sharing capability because each application has its own private files and users have little opportunity to share data outside their own application.

3) Lack of Data Integrity:-

To store accurate and correct data in the data base. To handle the data integrity problem various constraints are used.

4) Lack of flexibility:-

we cannot add more and more functions to the existing file processing system.

5) Difficulty in Accessing the data:- It is difficult to fetch the data in efficient manner.

6) Security Problems:-

Data Isolation, Atomicity, concurrency control.

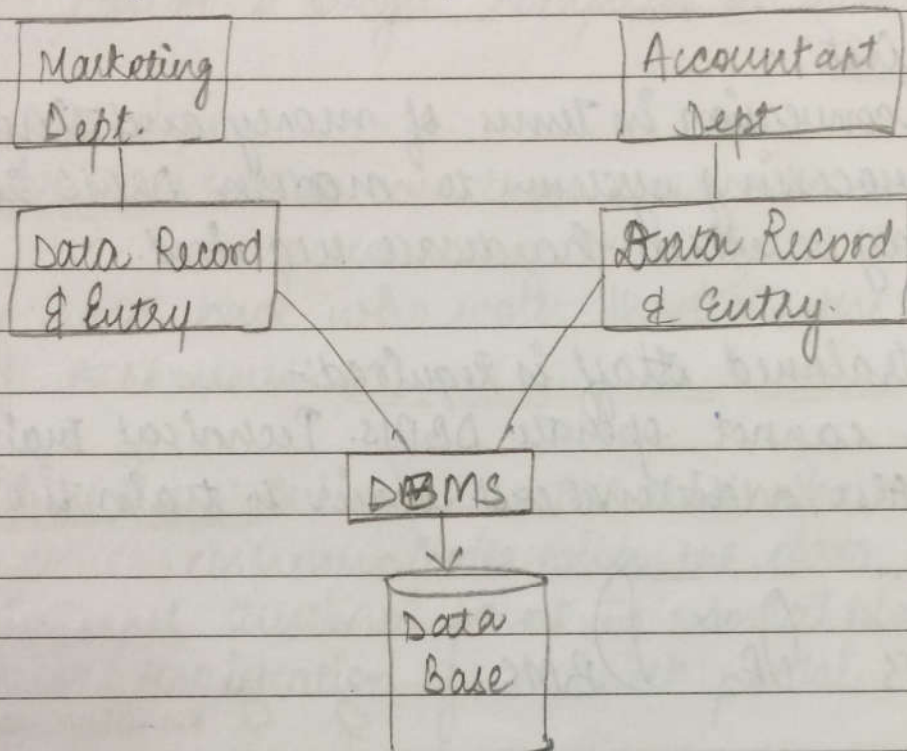
DATA BASE APPROACH

Advantages of DBMS.

- 1) Minimisation of Redundancy/Duplicacy:-
There is no duplicacy of same data because of centralised control of data by Data Base Administrator.
- 2) Avoidance of Inconsistency of Data:-
Due to redundancy, there can be inconsistency problem of a data, which can be removed by minimising the redundancy.
- 3) Sharing of Data:- It means the stored data is accessible to multiple users i.e., data can be shared to multiple application or user at same data.
- 4) Data Privacy & Security:-
Authentication:- getting username/password.
Authorization:- gaining the permission to read/write.
- 5) Data Integrity:-
Data stored in a data base is accurate and consistent. To ensure data integrity there are a number of constraints which user can be apply. Eg:- phone no. must be 10 digits and numerical.
- 6) Data Independence:- $\leftarrow$ Physical Data Independence,
Logical Data Independence.
If we change at any lower level of DBMS architecture. It will not affect upper level i.e., data is independent at each level.
- 7) Increase Concurrency/control:-
Simultaneously execution of a transaction at a

same place. Multiple user accessing the same data item at the same time.

8) Recovery and Backup:-



Disadvantages of DBMS.

1) Complexity of Recovery and Backup:-

Backup & Recovery of data is difficult process when large volume of data increase in terms of terabyte, petabyte, zetta byte, etc and more knowledge is required for backup and recovery.

2) Expensive Hardware and software cost:-

Expensive and quality hardware and software are used for high performance. Softwares & Hardwares are purchased which are

of high cost. Eg:- SQL Server (product of Microsoft)
structured query language.



3) Larger Size of DBMS:-

Due to complexity of DBMS and wide functionality it requires more space to run in main memory and large disk space to store data in term of Giga Byte (GB)

4) Conversion Cost:-

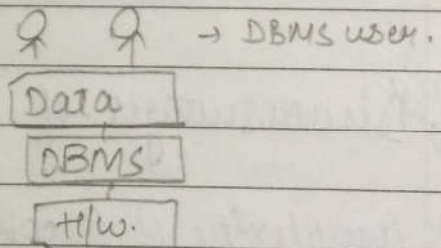
The cost of conversion in terms of money and time from old file processing system to modern DBMS is very high or may be extra hardware required.

5) Technical Trained Staff is Required:-

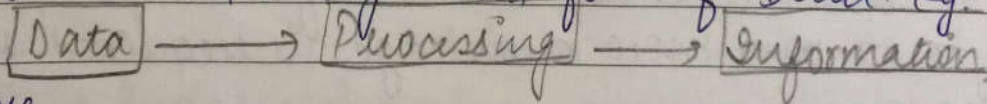
Common user cannot operate DBMS. Technical trained is required. Also, additional cost occur to train the staff.

COMPONENTS OF DBMS.

- Data
- ~~Data~~ ^{DBMS} User
- Software
- Hardware. ^{H/W}



Data is an unorganised form of Data. Eg:- 50, 20



Software

DBMS is a software tool which is installed on a client machine (computer). The basic funtⁿ of DBMS is to create interface b/w user & Data base.

Eg:- SQL

MySQL

Microsoft Access

Oracle.

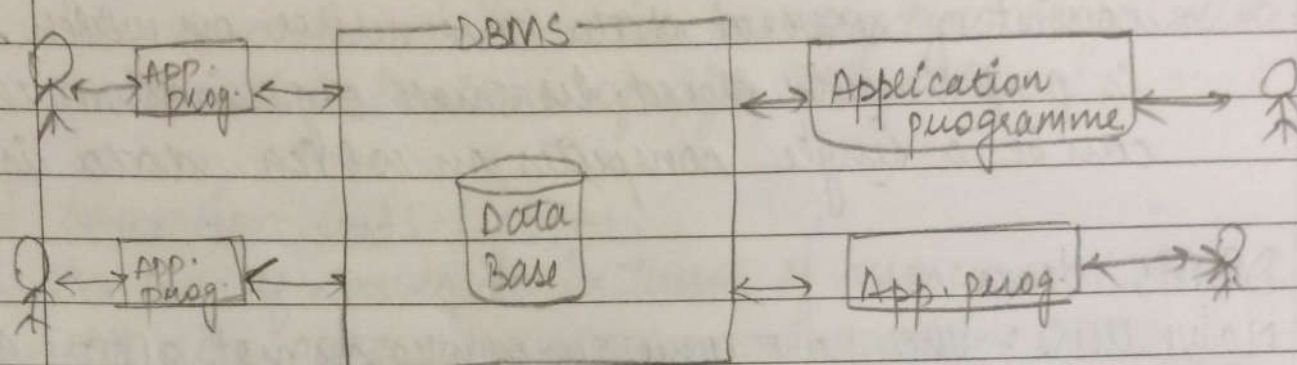


Hardware:- Refers to the computer system used for storing the data base such as Hard disk, and it may also consist of several data base server on which data is permanently stored. In small organisation, there can be a single computer on which data is stored.

DBMS Users

- 1) Naive Users:- These are those users who are not aware about the presence of Data Base. These are end users of data base who work through the application programme.
Eg:- ATM users.
- 2) Online Users:- Online users are those who use who may communicate with the data base through the internet terminal point. Eg:- social Networking websites, online registration form, web portal.
- 3) Sophisticated User:- These are those users which deal with system data base without using application programme. They use SQL query to access the data base such as to view the data, to delete the data or to upgrade the data. Scientists, engineers, business analyst are eg of sophisticated user.
- 4) Application Programme:- These are the users who are responsible for providing an interface b/w data base & other users which helps to ease use of data.
- 5) Data Base Administrator (DBA):- DBA is a person or group in charge for implementing the data base system with an organisation. DBA has all access (permission)

to manipulate the data. It has all power of DBMS.

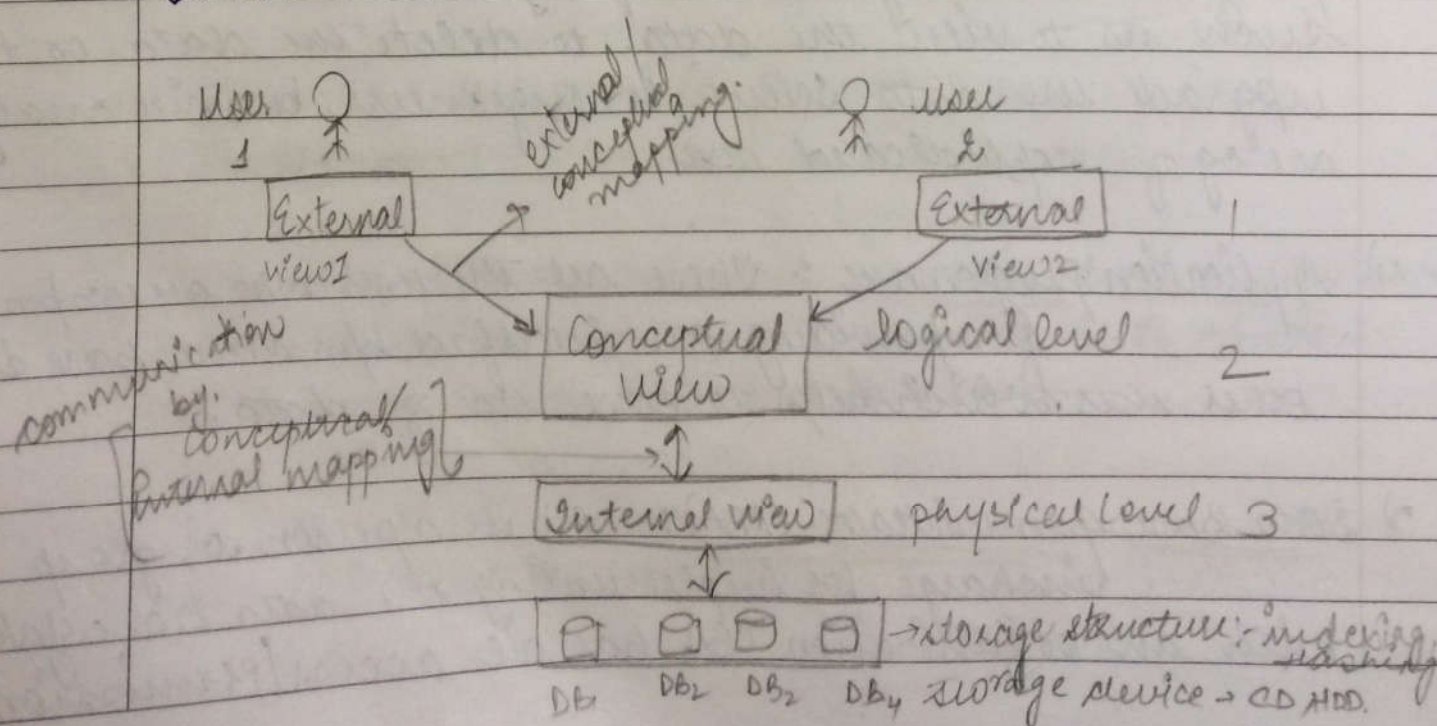


❖ ARCHITECTURE OF DBMS International Business machines
It is developed by E.F codd & IBM Laboratory.

Three-level of Architecture also known as ANSI/American National Standard Institute SPARC (standard planning and Requirement committee).

There are three levels such as

- External level
- Conceptual level
- Internal level





Objectives.

- Each user should be able to access the same data but have a different view of a same data.
- Each user should not have to deal with physical data base.
- The DBA should be able to change the data base storage structure without affecting the user view.
- Internal structure of data base should be unaffected when changes are performed on physical structure of storage.
- Each user should be able to change the way he/she can view the same data and changes should not effect the other user.

External View / External Level. (user view)

- It is also known as User View of Data Base and this view is closer to the end user. This level describe that part of data base which is relevant to each user.
- Each User can have its own view for same data base.

Name	Roll no.	Ph. no.	DOB
AA			
BB			

E.V.

logical →

Name	Roll no.	Ph. No.	DOB.
AA			
BB			

C.V.

entity - student

Conceptual View

- It is logical view of Data Base
- It hide the internal detail of physical storage. It describes what data is stored & the relationship b/w the data.
- This level contains logical structure of data base.
- This level represents all entity, attributes and relations.

Internal View.

- It is the lowest level of ~~architecture~~ architecture



- It deals with the physical representation of data.
- It describes how the data is stored.
- It includes storage structure, allocation techniques such as indexing, hashing, pointers, etc.
- It is also known as physical level which is very close to physical storage of data.
- It includes various physical storage device, HDD, CD, DVD or other secondary storage device.

DATA SCHEMA.

It represents overall structure or design of database. Or in other words, plan of data base. Schema describes the name of entity and attributes and their relationship. It is a frame work in which values of data items are fitted. The plan or format of schema ~~is~~ remain same but value of data item may change from time to time.

Three Types of Schema.

- Internal Schema
- External "
- Conceptual "

External schema

- It describe the different external view of data and there may be different schema for the database.

Logical Schema

- It describe all the data items and relationship b/w them.



- There is only one logical schema for the data.

Internal Schema

- It describes the definition of stored record, method of representation of data field and index.
- There is only one internal schema for the given data base.

DATA INDEPENDENCE

The separation of data from the programs that use the data.

Types

- Logical Data Independence (LDI) $\rightarrow$ Δ logical without Δ external schema
- Physical Data Independence (PDI) $\rightarrow$ Δ physical without Δ logical

LDI $\rightarrow$ The ability to change the logical schema of data base with changing the external schema is known as logical Data Independence. Eg:- Removal or Addition of a new attribute in a table.

PDI $\rightarrow$ The ability to change physical or internal schema without changing the logical schema. Eg:- change in file orientation/allocation technique.

Types of DBMS

- Based on Users
 - Single User DBMS eg:- Ms. Access
 - Multi User DBMS. eg:- Google
- Based on Technology
 - Centralised DBMS
 - Parallel DBMS
 - Distributed DBMS.