Objective of Database management system:

- To develop entity relationship data module and mapping tool relational module.
- Learn relational algebra and formulate SQL queries.
- Apply normalisation techniques to normalize the database
- Understand the concept of transaction, concurrency control and recovery techniques.

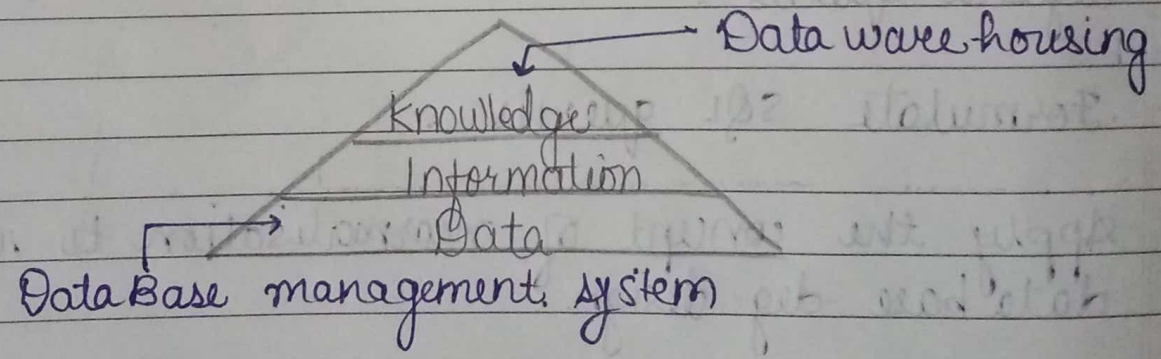
Outcomes of DBMS:

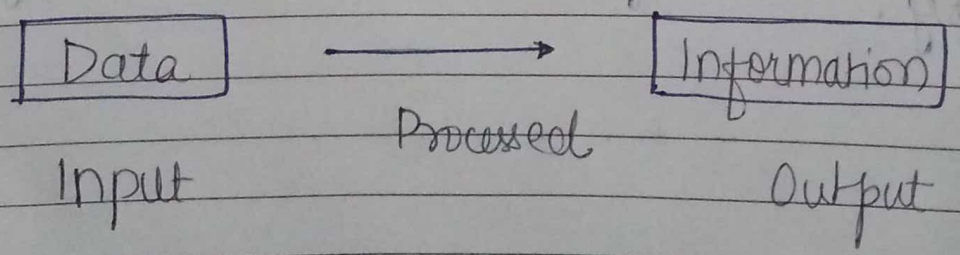
- Recognise the need of database management system.
- Design ER and ER diagram for real life applications
- Construct relational module and write relational algebra queries.
- Formulate SQL queries.
- Apply the concept of normalisation to relational database ~~dig~~ design.
- Describe concept of transaction, concurrency & recovery.

- Data :
Data is nothing but collection of raw facts which is not organised, processed or manipulated.
For example:
Practical marks of the students.

- Information :
If we apply certain rules on data we get an information. So processed form of data is termed as an information.
For example:
Average practical marks of division A.

- Knowledge :
What we got to know from the information is termed as knowledge.
For example:
Division A students have more practical approach than division B.





Data	Information
1. Data is collection of raw facts.	Info. is processed form of data.
2. For any system data acts as an input.	For any system info. acts as an output.
3. Data is independant	Information is dependant on specific data.
4. Data doesn't carry any meaning.	Information carries meaning.

Database:
Collection of interrelated data items, where data is created, stored and manipulated is called database.

Roll no.	Name	Age	Branch
1	Priyanka	26	Comp
2	Rahul	25	IT
3	Nikita	22	Mech

colomn

ROWS

Student table

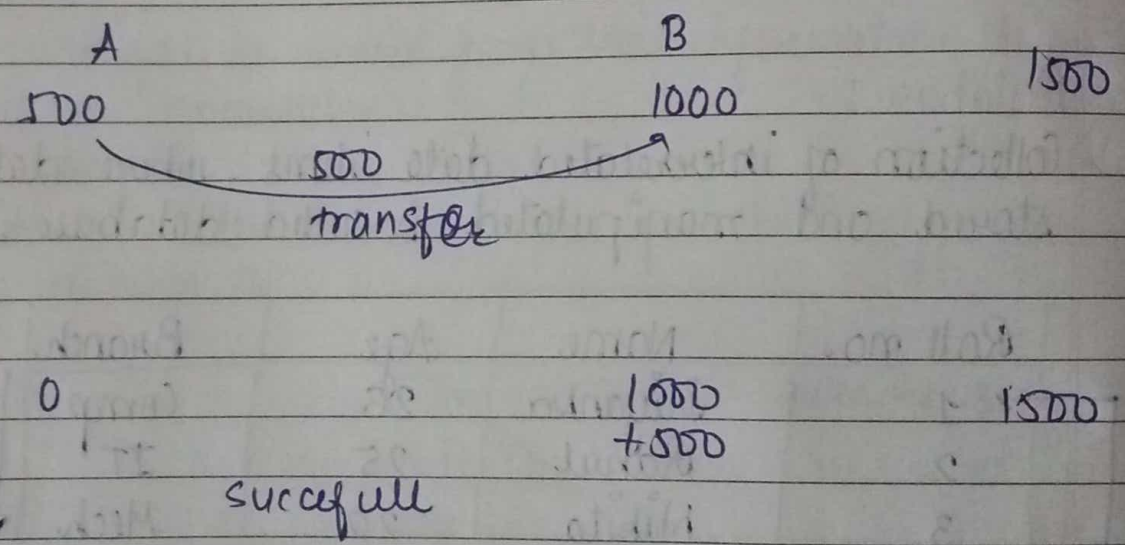
id	name	subject taught
11	priya	MDBMS
12	Neha	OS
13	sayli	UP

fig. Prof. Table.

- Database is collection of table.
  Table is collection of rows and colourmns.
  Row are termed as records or tuples whereas colourmns are termed as attributes, domain or feilds.

- Data Base Management System:
  Database management system is a software package which manages data for performing various opperation.
  For example:
  mySQL, Oracle, ms excess.

10. Atomicity:



If not then DBMS restores the amount back to A. But this not possible in FS.

→ 10 marks — IMP Question.

classmate
Date
Page

Difference betn file system & database management system.

Parameter	File System (FS)	DBMS
1. Definition	File system is an abstraction where different files are stored.	DBMS is software package for storing databases.
2. Example	Word documents, text documents.	Oracle, My SQL, Microsoft access.
3. Data redundancy	Data redundancy refers to the duplication of data where same peice of info. is repeated again and again. In FS, for each application, separate file gets created and therefore redundancy is more.	In this data redundancy is removed upto certain extaint as a single table gets created for the ~~as~~ applicatio
4. Sharing of data	Sharing of data is problem in file system as more no. of files need to be communicated in order to provide result.	Sharing is not an issue due to centralised structure.
5. Data consistency	Because of data duplication changes must be done in all the places where data is updated. If we forgot to make changes in few places it will result in inconsistency.	With the help of SQL, changes are made automatically on the tables.

6. Difficult to access/search the data.	In conventional file system, if we want to search any data item, searching becomes difficult as for each operation separate file is created.	Searching is easy by applying queries.
7. Data isolation	As data is represented with different file formats, data isolation is problem in FS.	In DBMS due to centralised structure format remains same.
8. Data Integrity.	Data integrity says that whatever info is inputed must be accurate one & should follow certain rules. In FS, this contraint is absent.	In DBMS we have contraints to provide data integrity.
9. Data security	File systems are less secure as compared to DBMS where password ~~sta~~ settings are available.	DBMS is more secure as compare to FS by providing encryption methods, biometric concepts, & password setting.
10. Atomicity	It says that all the transaction must be performed successfully or none of them is performed. This is absent in FS.	DBMS supports atomicity.

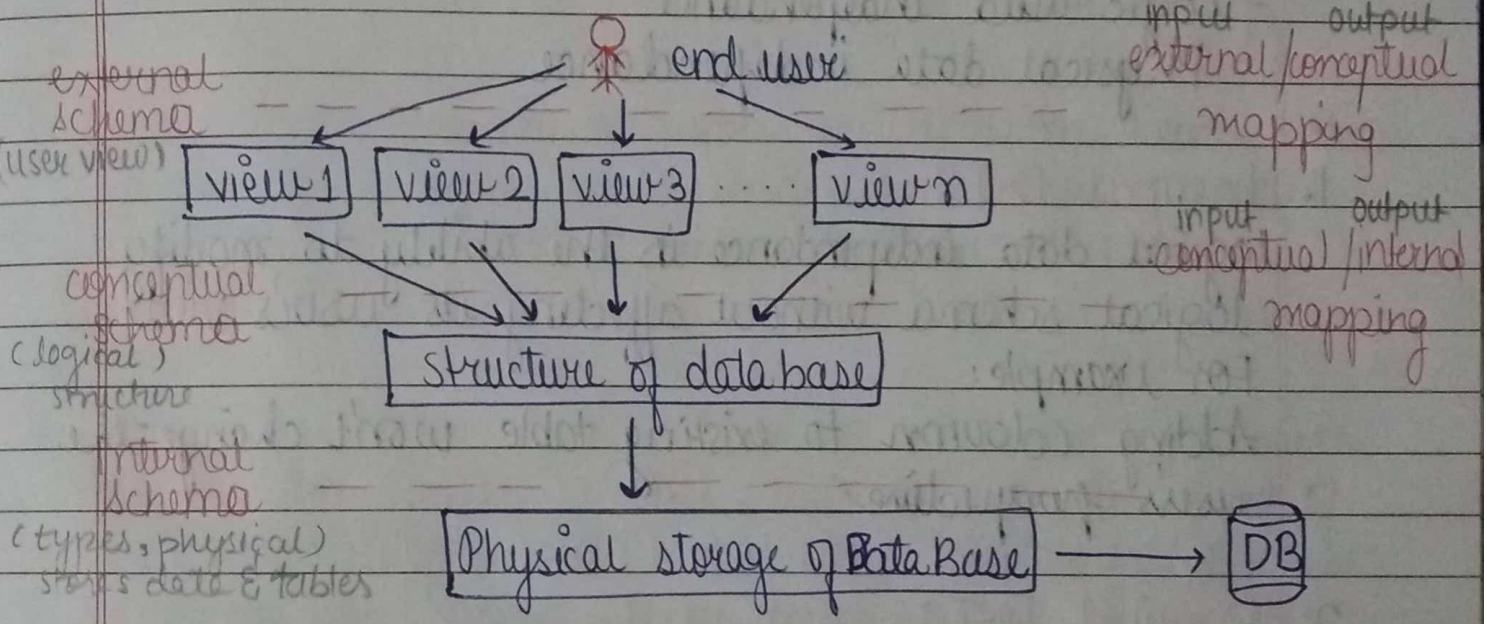
←

13/01/2022

11. Concurrent access anomalies — Concurrent access anomaly is not handled by FS. — If same data item is accessed by diff. transactions at the same time they may result in anamoly, which is resolved by locking mechanism of DBMS.

5m – IMP

- Three level architecture OR Three view of data (Data Abstraction)



1. external schema is also known as view scheme, as 'n' number ~~number~~ of users are the part of DBMS, each user has its own perspective towards DBMS.

2. It is also known as logical schema which ~~p~~ focuses on structure of DBMS. It describes the layout or blueprint of DBMS. It focuses on what kind of data to be stored in DBMS. For example: no. of tables, no. of attributes needed and relationship betn two tables.

3. It is also known as physical schema which focuses on physical storage of DBMS. (How data is stored). For example: memory size, data types and location of data base.

IMP:

5M → Data independance:

Data independance is the ability to modify one schema definition without affecting its next higher level.

It gets divided into 2 parts
- Logic data independance
- Physical data independance

1. Logical D.I:

Logical data independance is the ability to modify logical schema without affecting its user's view.

For example:

Adding coloumn to existing table won't change the user's perspective.

2. Physical D.I:

It is the ability for modifing physical schema without affecting logical structure.

For example:

Changing location of the database.

Characteristics of database:

1. self describing nature of db (metadata)
2. Data Independence
3. Multiple views of DB and security
4. Persistent data

1.
Data base has the ability to describe itself with the help of metadata (it is data about data acting as an information manual for the end users). (data dictionary)

3.
As 'n' numbers are involved in database each user viewing data base differently. Data base provides security to identify who is authorized user.

4.
Data base stores persistent data which says that even if power failure occurs, data will be the part of database. Data will not be deleted unless it is not deleted by the user explicitly.

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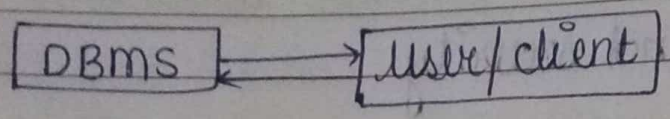
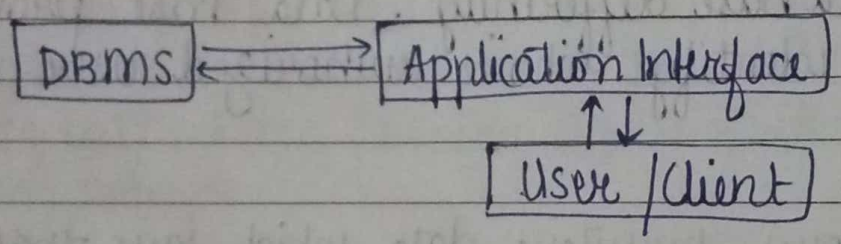
* ARCHITECTURE OF DBMS:

1. 1-tier architecture:



- In 1-tier architecture users can directly access DBMS.
- Hence, no security is provided as any user can come & access the DBMS.
- It is easy to understand and implement.
- This architecture is no longer used, only data base programmers and developers are using this.

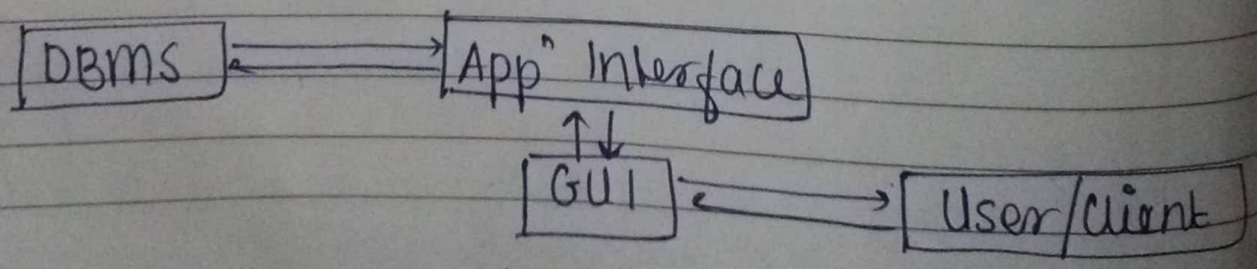
2. 2-tier architecture:



- In 2 tier architecture, users can communicate to DBMS via application interface (ODBC & JDBC) connectivity.
- It is more secure than 1-tier arch. but proper knowledge is needed to implement.

ODBC - Open Database connectivity
JDBC - Java - " ——————

3. 3-tier architecture:



- In 3-tier, GUI is introduced betn user & application interface
- For end user GUI is acting as database.

* USERS OF DBMS:

1. DBA (Database Administrator)

a) Developing Conceptual Schema
b) Deciding which DBMS to use
c) Defining and Loading DBMS
d) Assisting & approving access
e) Deciding Data Structure
f) Backup & recovery
g) Security
h) Integrity

2. DB Designers
3. Security Officers
4. End User
   a) Naive / Parametric end user
   b) Casual end User
   c) Sophisticated end user
   d) Stand-alone end user

1. Database Administrator:
Most important person of DB who administers, controls and manages DBMS.

1. Developing conceptual
→ overall structure of DBMS is developed by DBA.

2. Deciding which DBMS to use:
→ whether to develop new DBMS software or to use existing one.

3. Defining & loading DB:
→ Implementation of DBMS is guided by DBA.

4. Assisting & approving access:
→ Identifying authorized & unauthorized users.

5. Deciding data structure:
→ Decides which data structure to be stored and identify data types.

6. Backup & Recovery:
→ Continuously backing up the databases and helps in recovery from failure.

7. Security:
→ works in coordination with security officers to preserve the data set.

8. Integrity:
→ Identifies and checks the accurate information.

2. DB Designers:

2. Deciding which DBMS to use:
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→ Identifies and checks the accurate information.

2. DB Designers:
→ The job of DB designer is to identify the requirements of the end user and convey those requirements to the DBA.
Based on the requirements designing of the DB is also handled.

3. Security Officers:

→ They are responsible for preventing sensitive information from unauthorized users.

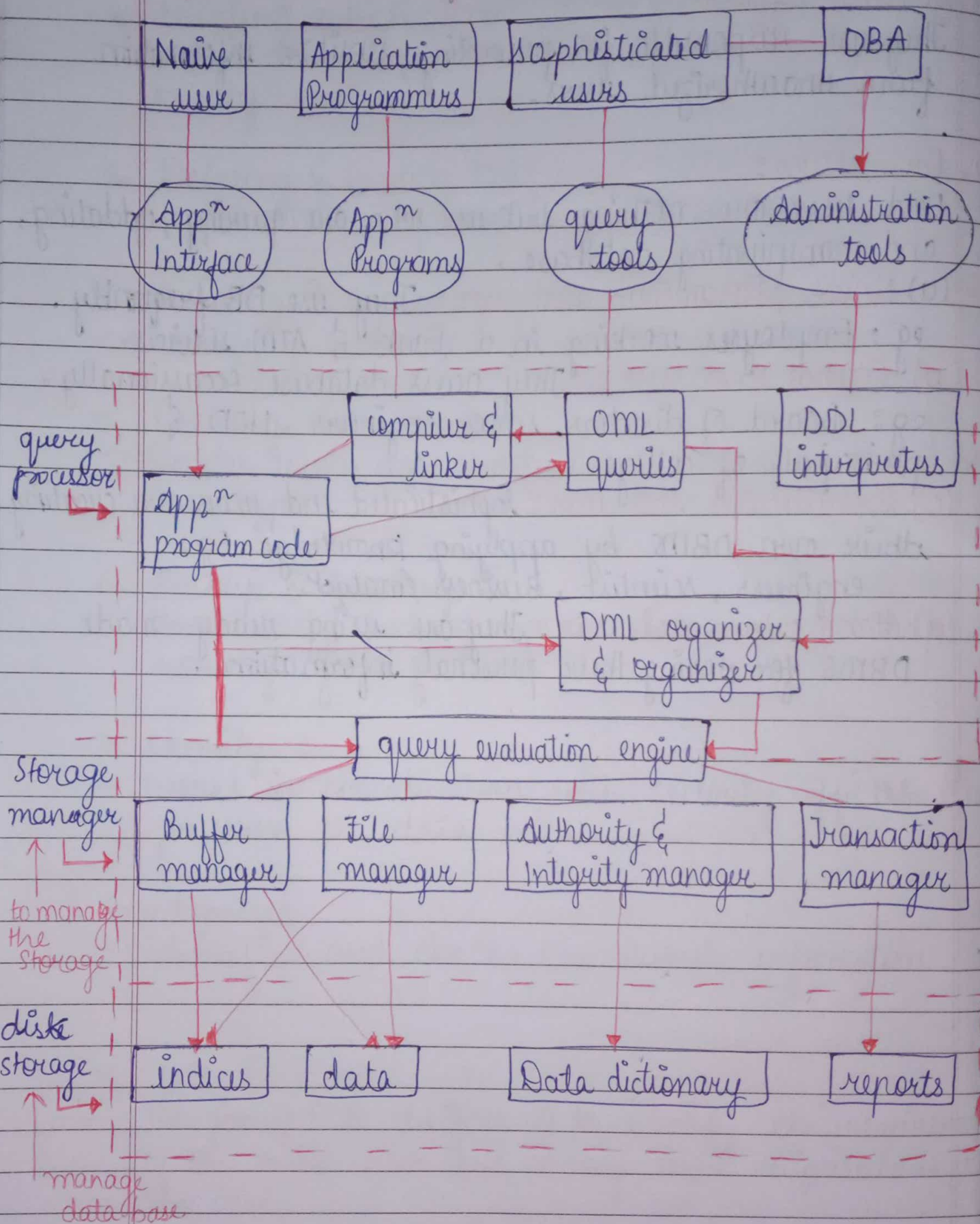
4. End Users:

→ End user are nothing but us who are querying, updating, and manipulating database.

(a) Naive / Parametric end user: They use DB frequently.
eg: Employees working in a bank & ATM services.

(b) Casual End User: They access database occassionally.
eg: Board of directors, senior engineers, HOD & principal of college.

(c) Sophisticated end user: Sophisticated end users are creating their own DBMS by applying knowledge. Eg: engineers, scientist, Business Analysts.

(d) Stand alone end user: They are using ready-made DBMS for storing their personal information.

* System structure of DB :