

UNIT ⇒ '6'

Future Trends

in

DBMS

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* Distributed DBMS :-)

Some organization use distributed database system rather than a centralised database system.

In the centralized database system, data resides in one single location.

But in a distributed database system it is stored in several computers. The computers in a distributed system communicate & exchange data among one other using base lines, telephone line, or other means of communication.

The computer do not share memory or clock. Each of the computer in distributed system participated in the execution of transaction. These computer is also known as sites or nodes.

* Advantages of Distributed Databases :-)

a) Data Sharing :-) Since data is distributed on multiple computer, user operating on one computer can ~~access~~ ~~see~~ ~~data~~

work on data available on my another computer.
(एक user जहाँ काम करता है वहाँ जाके comp. में store देता है।)

b) Distributed Control (n) Unlike centralized database system where a single database administrator controls the database, in a distributed system responsibility of control is divided among local administrators for each computer.

c) Reliability & Availability (n) Even if one ~~side~~^{site} fails in the distributed system, the remaining sites can continue working.

If data is replicated among multiple computers failure of anyone computer does not cause shut down of the entire database system.

d) Faster Query Processing (n) Queries involving data at several sites can be split into sub-queries. These subqueries can then be executed in parallel by several site. Such a parallel computation allow faster processing.

* Disadvantages of Distributed Database:-

- a) Increased Cost :- It is more difficult to develop 3rd packages to implement distributed database system. Also cost is involved in physically linking different sites.
- b) More Error Prone :- Since the sites that comprise distributed database system ~~are~~ in parallel, it is very difficult to ensure the correctness of data.
- c) Increased Overhead :- Maintaining physically links between the sites & exchanging messages among computers in an additional overhead associated with distributed system, that are absent in case of centralized system.

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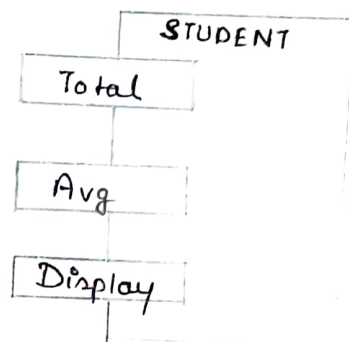
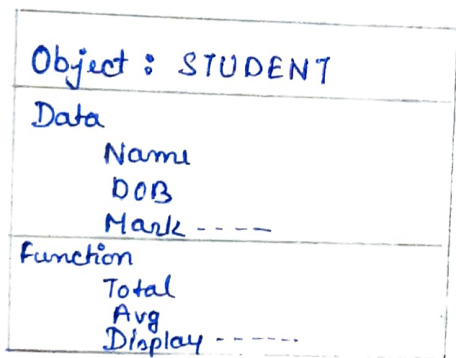
* Object Oriented Database (OODB) :-

- * Object-Oriented Programming :- It is an approach that provides a way of modularizing program by creating partitioned memory area for both data & function can be used as templates for creating copies of such modules on demand.

Example :- C++, Java.

* Basic Concepts of Object-Oriented Programming :-

- Object :- Object are the basic run-time entities in an object-oriented system.



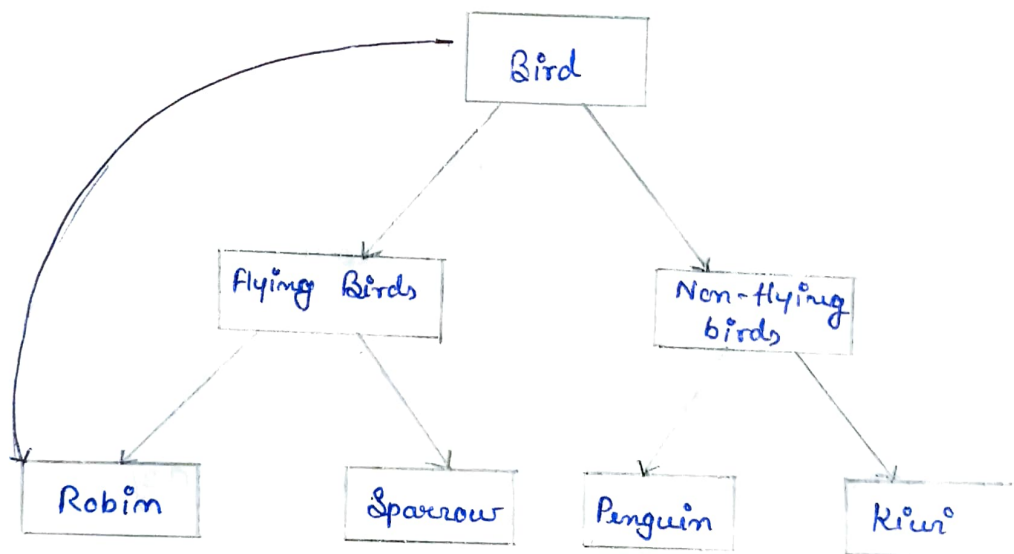
(Two-way of representing an object)

- Classes :- The entire set of data & code of an object can be made a user-defined data type with the

help of a class.

Fruit Mango;

- Encapsulation :- The wrapping up of data & function on to a single unit (called class) is known as Encapsulation.
- Inheritance :- Inheritance is the process of which object (उत्तराधिकारी) of one class acquire the properties of object of another class.



- Polymorphism :- Polymorphism means ability to take more than one form.

Example :- C++, Java

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* Object-oriented Database (OODB) :-

OODB are dependent on the object oriented programming paradigm. It enables us to create classes, organize objects, structure an inheritance hierarchy & call method of other classes.

Besides these it also provides the facilities associated with standard database system.

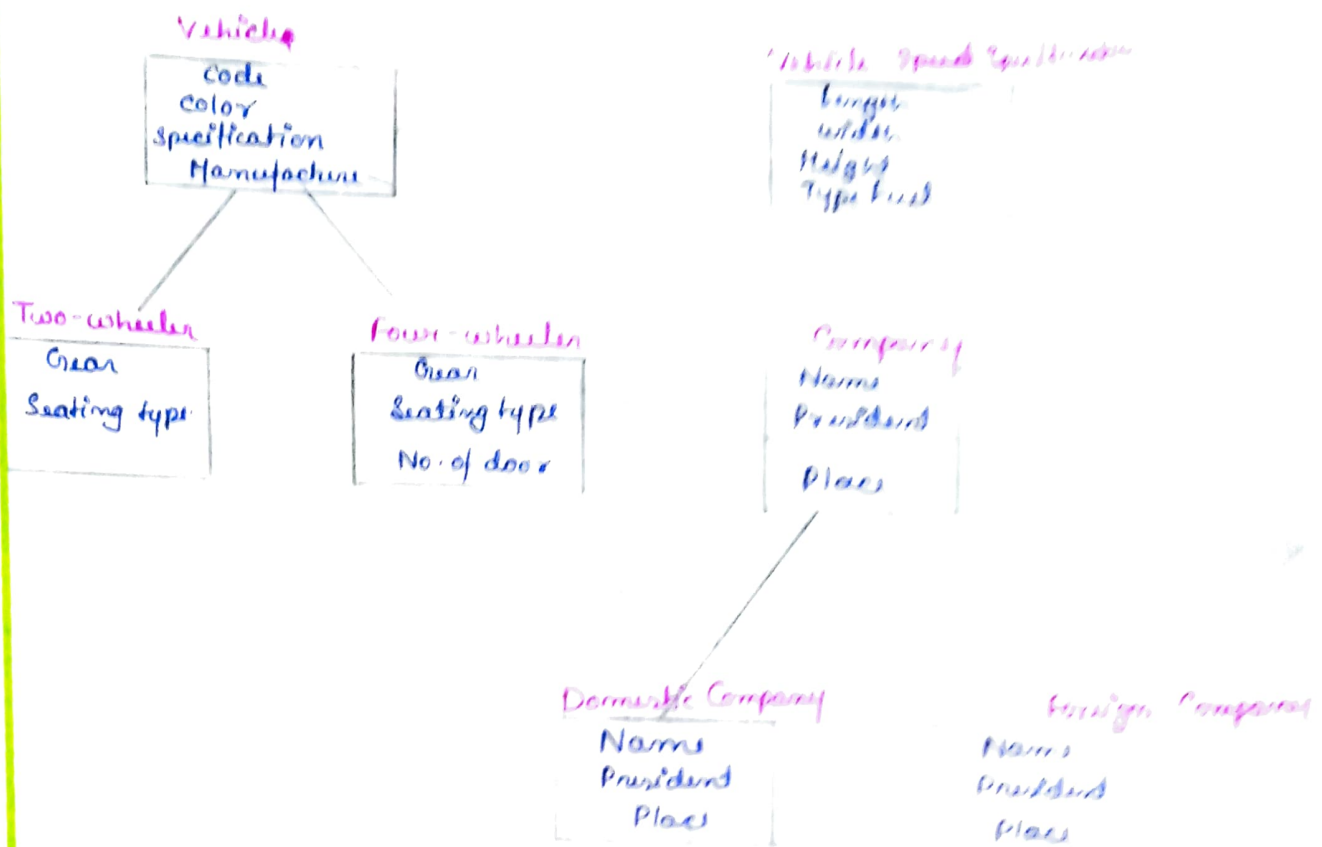
However, object oriented database system have not yet replaced the RDBMS in commercial business application.

• Following are the two different approaches for designing an object oriented database.

- a) Designed for store, retrieve & manage object created by programs written in some object-oriented language OOL such as:- C++ or Java.
- b) Designed to provide object-oriented facilities to user of many object-oriented programming language (OOPs) such as:- Pascal.

That means the user will create classes, objects, inheritance, hierarchy & soon the database system will store & manage these object & classes.

• A SAMPLE of Object-oriented Database.



—————→ Solid lines → class-sub class links.

-----→ Attribute - domain links.

* Advantages of OODBMS over RDBMS :-)

- 1) RDBMS does not allow nested structure. Nested structure applications are found in CAD/CAE, computers and aerospace science etc. It is easier to navigate

through these complex structure in the form of object rather than in the form of tables & records.

- ② RDBMS has limited no. of data type like int, char, text, etc.

Although we can create complex data types in Relational database by combining field. But OODBMS allow arbitrary data types & sub-classing with inheritance.

* Knowledge Base System :-

- Knowledge :- It is defined as the body of facts & principles accumulated by human kind or the act, fact or state of knowing.

The meaning of knowledge is closely related to the meaning of intelligence.

Characteristic of intelligent people is that they possess much knowledge.

- Example:-
- Manufacturing Technique.
 - Marketing Sector Strategies etc.

* Knowledge Base Management System → (KBMS) ⚡

As like as a DBMS, we can define a ~~kb~~ KBMS as a computer system used to manage & manipulate shared knowledge.

• A Knowledge Base Management Systems manipulation facility includes as:-

i) Reasoning Facilities ⚡) Usually including aspect of one or more form of reasoning:-

i) Deductive Reasoning implies that a new fact can be inferred from a given set of factor knowledge using known rules of interference.
(अनुमान करना) (देखल)

ii) Inductive Reasoning → It is used to prove something by first proving a base fact then the increment step.

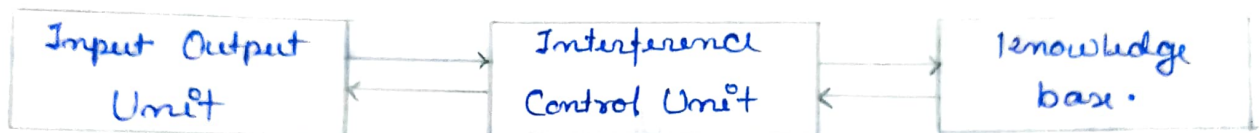
iii) Abductive → It is used in generating a hypothesis hypothesis to explain observation.

* Components of DBMS & K.B.M.S :-

In DBMS starting points data &

1) In K.B.M.S is a knowledge representation scheme.

2) Both have similar architecture, both contain a component to model the information being managed by the systems.



* Expert Database System :-

• Expert System :-

A program that contains a large body of knowledge concerning one special field, this having been provided by one or more human experts in that field and able to achieve the same performance to achieve the same in problem-solving as those experts.

This not to be understood as excluding knowledge taken from books or

• or other written material origin along with the inputs.

This type of knowledge usually requires much training & experience. In some specialized field such as:-

Medicine, Geology, System configuration, or engineering design.

Example:-

1) DENDRAL (first expert system).

(This system is capable to determining the structure of chemical compound).

2) MYCIN (diagnosis infectious blood disease).

* Expert Database Systems:-

Expert systems have been developed as stand-alone systems. A stand-alone expert system may be required to access data from a database as an ordinary application program. With an inter-

grated approach, the expert system is integrated with DBMS.

Such as: - Integrated system will be called upon to perform the traditional DBMS functioning & use the syst interference system in aspects of reason reasoning.

