## Databses And Databses Users

## Section 1.1 Introduction

**Database – is a collection of related data.** By data, we mean known facts that can be recorded and that have implicit meaning. For example, consider the names , telephone numbers, and addresses of people you know. This data can be recorded in an indexed address book or stored on a hard drive, using a personal computer and software such as Microsoft Access or Excel. This collection of related data with an implicit meaning is a database. Nowadays , this data is typically stored in mobile phones, which have their own simple database software.

**A database has the following implicit properties :**

A database represents some aspect of the real world , sometimes called the miniworld or the universe of discourse(UoD).Changes to the miniworld are reflected in the database.

A database is a logically coherent collection of data with some inherent meaning. A random assortment of data cannot correctly be referred to as a database.

A database is designed, built and populated with data for a specific purpose. It has an intended group of users and some preconceived applications in which these users are interested.

In other words, a database has some source of which data is derived, some degree of interaction with events in the real worlds and an audience that is actively interested in its contents. The end users of a database may perform business transactions (for example a customer buys a camera) or events may happen (for example an employee has a baby) that causes the information in the database to be changed. In order for a database to be accurate and reliable at all times, it must be a true reflection of the miniworld that it represents, therefore changes must be reflected in the database as soon as possible.

Traditional Database Applications – store text and numeric data.

Multimedia Databases-store images, audio clips and video stream digitally.

Geographic Information System(GIS)-store and analyse maps ,weather data and satellite images.

Data Warehouse and online analytical processing(OLAP) systems are used in many companies to extract and analyze useful business information from very large databases to support decision making.

Real time and active database technology is used to control industrial and manufacturing processes.

and Database search techniques are being applied to World Wide Web to improve the search for information that is needed by users browsing the Internet.

A **Database Management System(DBMS)** is a computerized system that enables users to create and maintain a database.

**The DBMS is a general –purpose software system that facilitates the process of defining, constructing, manipulating and sharing databases among various users and applications.**

**Defining** a database involves specifying data types, structures and constraints of the data to be stored in the database. The database definition or descriptive information is also stored by the DBMS in the form of a database catalog or **dictionary**, it is called meta-data.

**Constructing** the database is the process of storing the data on some storage medium that is controlled by the DBMS.

**Manipulating** a database includes functions such as querying the database to retrieve specific data , updating the database to reflect changes in the miniworld , and generating reports from the data.

**Sharing** a database allows multiple users and programs to access the database simultaneously.

An application program accesses the database by sending queries or request.A **query** typically cases some data to be retrieved , a transaction may cause some data to read and some data to be written in to the database.

**Protection** includes system protection against hardware or software malfunction(or crashes) and system protection against unauthorized and malicious access.

**Maintenance** –DBMS must be able to maintain the database system by allowing the system to evolve as requirements change over time.