UNIT:6 DATABASE

1. INTRODUCTION OF DATA:

Data is the set of static values or raw facts or figures these are raw components of information and that represent as information after processing. Data are entered into computer to perform any operation and task and to solve particular problem. When the activities in the organisation takes place, the effect of these activities need to be recorded which is known as data. For example the raw material to be purchased may have many facts like type of raw material, vendor name, address, quantity etc. Likewise Organisation will have many transactions and entities which are to be recorded. It is the numbers, letters or symbols representing the facts or features, which may or may not give any sense. E.g. Principle, rate and time are data. Data can be suitably arranged for communication, interpretation and processing by humans to complete their task. Example: A, Ram, H-123, Butwal etc.

2. DATA PROCESSING:

Data processing is a series of actions or operations that convert input data into output as meaningful information. The data processing system is used to include the resources such as people, procedures and devices to accomplish the processing of data for producing desired output. Data processing also refers to the complete check of the data validity, accuracy, consistence, integrity and user needs.

3. FILE PROCESSING:

File processing is the process of creating, storing, accessing and modifying the contents of file. Example of file processing : Creating MS-Word file and Saving into Hard disk drives' any area. There are two types of file processing systems: Sequential file processing and Direct-access file processing. Sequential file storage devices are Magnetic tapes, Cassettes etc. Direct access file storage devices are Hard disk, Floppy disk, Pen drive, CD-ROM etc.

4. DATABASE:

Database is well organized collection of data and information which can be reused later when required. It is the set of collection of data that is organized in specific order and that can be easily accessed, managed, updated and computation. It is data collection which stored on physical media such as magnetic disks, optical disks etc. The database has its own importance. It stores data, saves data from being lost, save time while entering, accessing, protects data from unauthorized access and users. E.g. Phone Diary. The table in a Ms-Access is database as it stores data of different objects.

* **Conventional Database:** Collection of data without use of computer. E.g. Telephone diary, register.
* **Computerized database:** The collection of data with the help of computer in the form of data file is known as computerized database. The types of computer systems that can run database management system are Centralized PC and Client/Server and distributed.

Importance of Database:

- Data can be stored in small area.
- Computerised database save time while entering and altering the data.
- Computerised database save time while searching or accessing data.
- Database can store and save data for the long period.
- Computerised database save data from being lost.

Elements of Database:

1. **Field:** Smallest unit of Database.
2. **Record:** A Collection of multiple related fields.
3. **Table:** A collection of records or group of records with the row and column order.
4. **Tuple:** A record row in the database.
5. **Index:** It is a process of organizing data in specific order.
6. **Cell:** A cell is a inter section of rows and columns.

5. DATABASE MANAGEMENT SYSTEM:

To overcome the problems such as high data redundancy, difficulty in represent data, data inflexibility, integrity problem, data modification and alteration problem, data security problem etc. of data and file processing system the data base management system were developed. Database Management system is a computer program which is designed to manage a large set of data and run the operations on the data represented by the user. It is a software package or program which manages and manipulates the data stores in database and provides the information. The DBMS includes accounting, human resource ad customer support system. It allows the user to create computerized database and add, change and delete the data as well as sort and retrieve data. DBMS stores the data and records, processes them and obtains the information. Database Management System ensures the persistence, consistency, correctness, reliability and availability of the data stored in the database. Some useful Database

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Management System softwares are Ms-Access, SQL/SQL PLUS, dbase, FoxPro, Sybase, Oracle, IMS, IDS, IDMS, AdaBASE, CDS/ISIS, OMNIS, RBASE, FOXBASE.

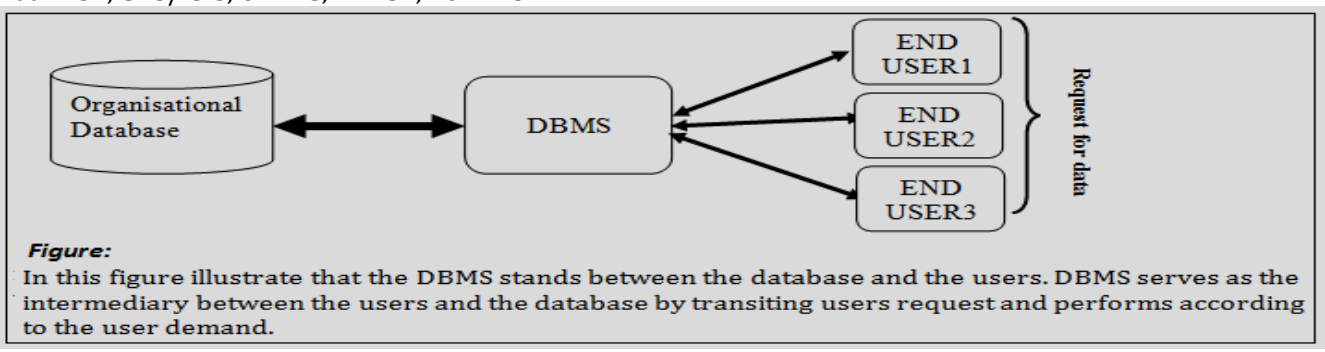

Figure:
In this figure illustrate that the DBMS stands between the database and the users. DBMS serves as the intermediary between the users and the database by transiting users request and performs according to the user demand.

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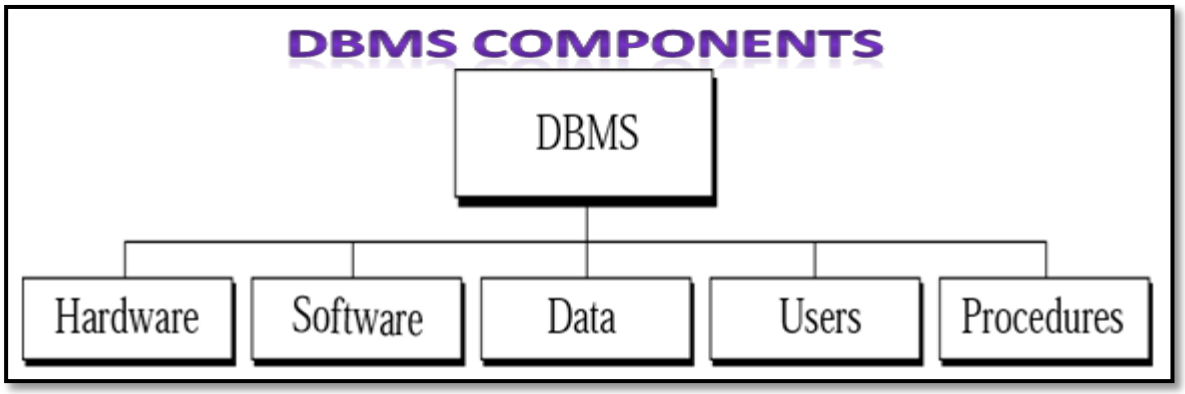

Features of Database Management System:

- It provides easy environment to add new data, modify entered data and delete unnecessary record.
- It provides easy environment to reuse stored data in future.
- It provides easy environment of accessing stored data to different users simultaneously.
- It provides sorting, filtering, indexing features to manage data in any specific order.
- It reduces the data redundancy.
- It facilitates the backup or recovery mechanism.
- It contains several features related data security.

6. APPLICATION AREAS OF THE DATABASE MANAGEMENT SYSTEM:

1. Banking Software: Almost all the Banks of Nepal are being computerized .These all banks maintain database for customer information, account information, balance and loans and other banking transactions.

2. Airlines system: Airline corporations maintain the database regarding the number and condition of their planes, statics of leased and owned planes**,** flight Schedule and others.

3. **University System:** University system keep track of University itself record, other Colleges / Universities records and related documents record, student's records ,exams, departments, co-curricular activities and other various events and activities.

4. Telecommunication Software: Nepal Telecom Authority (NTA), Spice Nepal, United Telecom Limited etc. preserves database of its customers and their phone calls, bills, and other various related information.

5. Finance: In any financial department keep information of holdings, sales and purchase of financial entity as stocks and bonds. Keep records of loan holders and other related information.

6. Manufacturing: Manufacturing companies also keep database regarding supply chain management and tracking of products and inventories of items in stores and order for products. Keep records of various godowns and sub departments and stock items.

7. Human Resource: Human resource departments keep records of application, personnel information and other human resource related data.

7. RELATIONAL DATABASE MANAGEMENT SYSTEM:

In specific case of relational database, the database management software is called RDBMS. The objectives of DBMS are to provide convenient and effective method of defining constructing or storing, and retrieving and manipulating database for various applications. RDBMS is the most popular Database Management system in the world which organized data in the form of tables. In RDBMS, a field or column existing in two tables creates a relationship between the tables.

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Features of RDBMS:

- It deals efficiently with large amount of data.
- It easily links two or more tables.
- It reduces data duplication.

Difference between DBMS & RDBMS

SN	DBMS	RDBMS
1.	DBMS stands for Database Management System	RDBMS stands for Relational Database Managem System.
2.	It supports single user only.	It supports multiple users.
3.	It treats data as file internally.	It treats data as table internally.
4.	Constraints are not use for relationship.	Constraints are not use for relationship.
5.	Examples: Fox Pro, IMS etc.	Examples: SQL Server, Oracle etc.

8. SOME TERMS RELATED DBMS:

Data Processing: It is activity in which raw data are processed to obtain meaningful information. The data processing steps are; data collection, filing, coding, data entry to computer, list printing, list checking and editing, updating the data records, final list printing, final data approval and processing to obtain the desired result.

File: A file is the collection of related records on a disk and accessed by a unique name.

Field: It is the smallest unit of storing data. A field is the column of a table. It is used for storing the value of attribute of an entity. Examples: name, address, telephone number are three different fields for a person.

Record: It is the collection of multiple related fields that can give complete information about an entity. It is the row of a table. It is also known as tuple. The collection of name, address and telephone number are complete one record.

Relationship: In a database we can establish relation between any two or more tables. Because no data are isolated, but they are associated or related with each other entity in one or another ways. we can generate reports and manipulate data using such relationship between tables.

Types of relationship:

- **Many to many relationship:** A many to many relation is unclear. Many to many relations often are a sign that further analysis is required.
- **Many to one relationship:** Many to one relation is the same as one to many, but from a different view point. Using this relation two or more fields of one table can be link with one field of another table.
- **One to many relationship:** Most relation in tables are one to many, means one field of a table can be link with two or more fields of the another table.
- **One to one relationship:** A one to one relation exception in database. It can be established using primary key and foreign key in the DBMS.

9. E-R DIAGRAM:

Entity Relationship Diagram is sometimes called ER-Diagram or ERD. It is a Data Modeling technique that is concerned with the data and how data is independently captured and used. It is also called as Data Modeling Languages or notation. E-R Model was introduced by P.P. Chen in 1976 as the data diagramming technique. It is used to :

- Represent conceptual level of a database system
- Describe things and their relationships in high level

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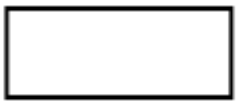
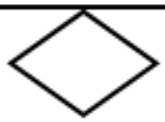
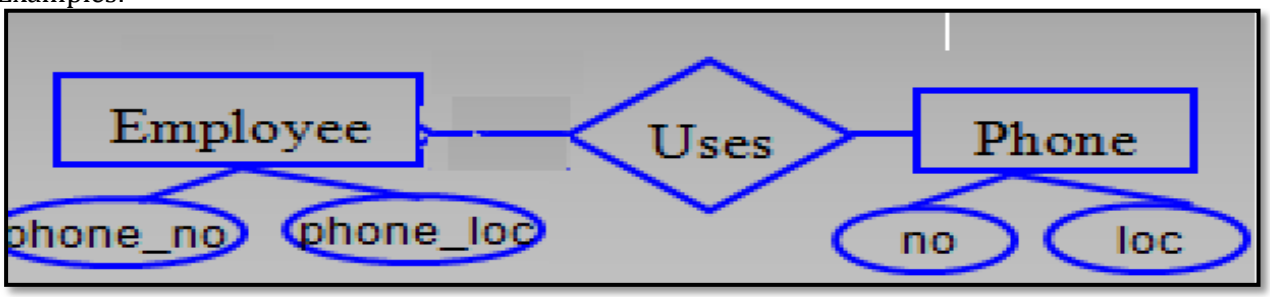
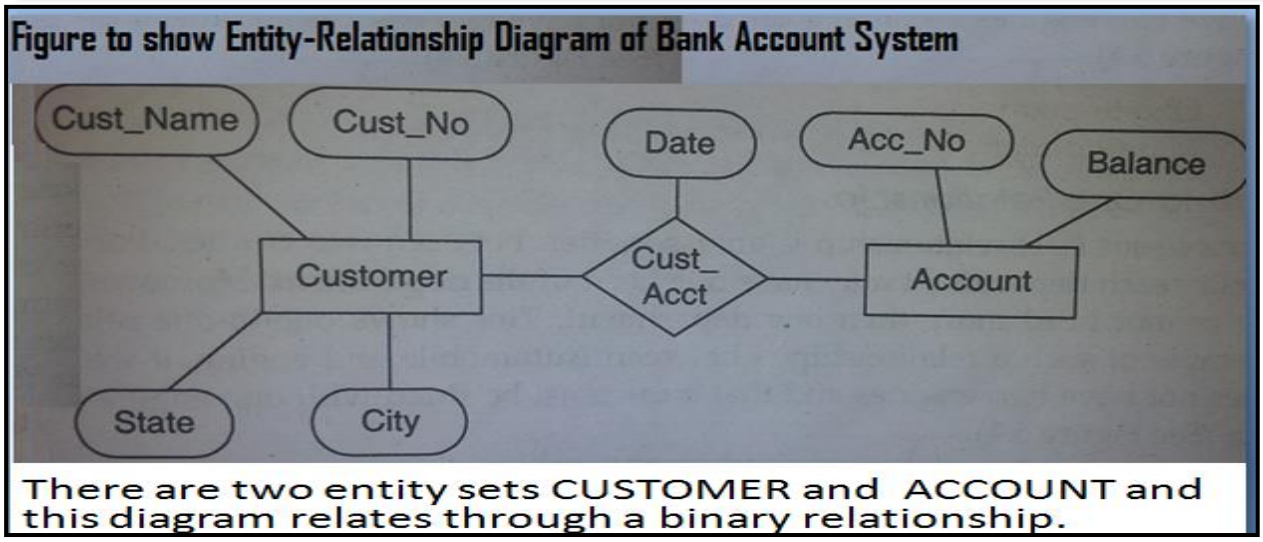
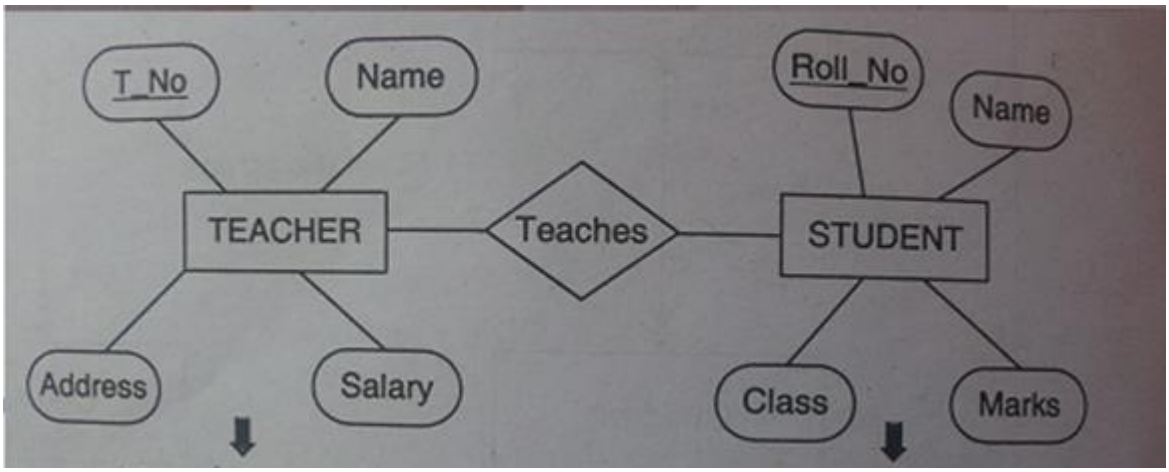
Elements of E-R Diagram:

SR	COMPONENTS	SYMBOL	NAME	Description
1.	Entity		Rectangle	Rectangle is used to represent entity sets like persons, places, objects, events, concepts etc.
2.	Attributes		Oval	Oval represents attributes which are the characteristics of an entity like element, property or field.
3.	Relationship		Diamond	Diamond represents the relationship among entity sets. Relationship is the natural business association between one or more entities.
4.	Links		Line	Line links attributes to entity sets and entity sets to relationship.

Examples:







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