15
Database Management System

Learning objectives :

After studying this chapter, you will :

- Know the concept of data and database
- Know the key features of the Database Management System
- Understanding the components of Microsoft Access
- Understanding Structured Query Language
- Preparing a table for the database.

Various types of transactions are done on day to day basis in a business organization. All these transactions are of financial nature. These transactions are recorded in the form of various financial statements and accounts books. At the end of the year, the profit or loss is determind by finalizing these accounts. In this process of accounting, it takes time to make decisions since different categories of data are used. The reason behind is that the entre accounting data is not available in a single book or place. The data contained in these books are related to each other, that is, they influence each other. For example, sales affect cash balance or debtors balance. Sometimes the firm needs to take business decisions on the basis of data related to last ten or fifteen years. It may be that data for such a long duration is not available. There are several types of obstacles to store these data for a long time. Like, on the basis of profit or loss of the last ten years, it is difficult to instantly estimate the profit and loss for the coming years. This makes it difficult to reach a better business decision. A computerized information management system has been built to overcome all these types of challenges.

Concept of Database Management System

This information system provides information for management decisions through various types of data. All these data are organized and converted into information as per the requirement, through database management system. This system is a group of programs created to use co-related data. Its purpose is to collect data through the software and do data management as per the requirement of the business. It also converts the collected data into certain information. It is used in different areas, such as railway reservations, bus reservations, examination control, stock, payroll preparation warehousing, employees related salaries, attendance etc. A database management system (DBMS) can be defined as a collection of programs that enables you to store, modify, and extract information from a database. The database management system principally controls three activities and principally operates through the following :

(i) Data base engine: It provides data and modifies it accordingly. The task of fully controlling the data depends on the database engine.

(ii) Data : These are the sources of information.

(iii) Database scheme: It is the structure that represents the entire database.

Thus, it is a centralized information system, in which many types of data are used by the user in different

types of decisions through computer.

Functions of database management system

1. The main function of the database management system is to collect and retrieve different types of data through appropriate media. For example information of students studying at a school can be stored in the following format, the name of the student, father's name, roll number, address, class, date of birth etc.
2. The system manages all large scale information of an organization so that such information can be utilized in a planned manner.
3 This system provides the ability to create, modify, and improve data for its users.
4 It is a system that provides the multiuser facility for the same database. That is a single database can be used by more than one users.
5 It allows the use of data only to its authorized users and safeguards the data from any unauthorized use. According to this facility, the user can work on the data of his own department, which keeps the security of the information of other departments. The data access in not extended to any other department without permission.
6. It coordinates data and reduces unnecessary data, which briefs the data. This brief data make it easy to make decisions.
7. DBMS provides varied views to its users. For instance the sales department has a different view of the screen in comparison to the user of the accounting department. The data used by the respective users in accessed from common database.

Advantages of DBMS

1. Establishes coordination between various sets of data and reduces unnecessary figures that distrub clarity in decision making.
2. DBMS collects data by using advanced computer based techniques. This data is accessed by its user. It also simplifies and broadens the complex data.
3. Provides a variety of users access to data as per their individual need.
4. DBMS provides the facility to recover data, retrieve data for various purposes.
5. Data can be imported or exported through DBMS to maintain the authenticity and stability of the data. Thereby increasing the reliability of the data.
6. It analyzes the data in the shortest possible time, which helps in speedy decision making process.
7. DBMS can be used by more than one user. This helps in establishing a productive coordination among various departments. In the single database, the purchase and sales departments of an organization can use the data at a given point of time. The data of the production department depends on how much sales will be done in the financial year.
8. Electronic security is provided to the entire data used in the process. It is secured by a password given to the user. Users can not use the information of any other department, unless it is permitted. It also provides protection of data at different levels by departments.

Components of Database Management System

The key elements of the database management system can be understood as follows :

1. Database : A group of collected data that are related to each other, through which certain information is created. For example, marks secured by all the students of a school in the examination are a database. On the basis of this database , we can calculate the total number of students who passed in first class and second class, third class. Similarly, students who failed in any class or subject can be also counted. The above mentioned data can be used to calculate attendance of the students in class. The processing system does the following tasks with the help of database:

- Data Collection
- Data Editing
- Data Manipulation
- Data Storage
- Data Analysis
- Output

2. Administrator : The responsibility of operating the DBMS is of administrator. They build profiles that are used by different users. For example, data of the students in a school can be used by students, teacher and school administration. DBMS administrator can create three different types of profiles. Student Profile, Teacher Profile, School Administration Profile .From the point of view of the data security, it is ensured that the respective data will be used only by authorized persons. A student can see the total attendance in his class, and he can also see the presence of another student, but he cannot see the marks of any other student.

3. Data : Data can be any type of information, the quantities, characters, or symbols on which tasks are performed by a computer, which may be stored and transmitted in the form of electrical signals and recorded on any recording media like the hard disk, pen drive etc. These types of data are related to each other. Such as name, roll number, address, city district etc. are certain examples of data. In a business entity, there are various types of data, such as purchases, sales, profit, loss, expenditure, bank accounts, labours working in the factory etc.

4. Software : Any kind of information is handled through software. Software is a collection of instructions that enable the user to interact with a computer, its hardware, or perform tasks related to database management system. Software stores, processes, creates data, and so on. For example MS Access, MS Excel.

5. User Interface : The means by which the user and a computer system interact, in particular the use of input devices and software**.** It includes the preparation of screens, which relate to user-friendly relationship with user. The screen, which will be visible to user, by which the user will set up the relationship and would input some of the data in computer or would like to see some output. For example, to make any software for the library, the screen that will be used by librarian, students, etc. will be user interface, through which the users will be operating.

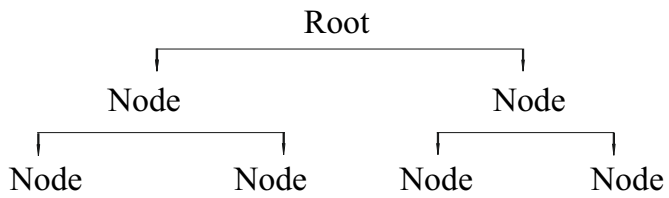
6. Data processing : The user wants output based on information provided to the computer through interfaces, computer interfaces, based on programmed instructions of database management system. This complete process is called data processing.

7. File Handling Programs : These programs help in storage of data, searching files, creating files, editing the files, existing files and managing files. All the files related to our application are in the storage, so that the data may be taken as necessary.

Types of Database Management System

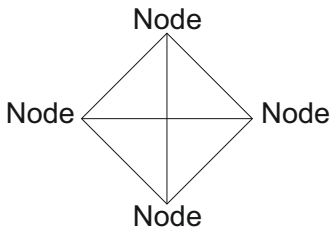
(1) Hierarchical (2) Network (3) Relational

1. Hierarchical Design : The earlier designed databases were hierarchical, in which one main route and remaining branches were considered. Its branches (one-to-many) are floated in the form of a tree, hence it is not a transitional structure, no one can interact with the media and the data will be in the same direction. Due to these shortcomings, the design of the database has been changed so that the data can be used in full and appropriate manner and at the right time. It has been shown by the following picture. (Picture 1)



Picture 1 : Hierarchical Design

2. Network : In network system, each and every databases are inter connected. The data in the network model are represented by collection of records and relationships among data, are represented by links, which can be viewed as pointers. In other words each node is connected to the other. The data are made available wherever it is required. The flow of data is not restricted to a particular direction. The flow of data is from many to many. Representation of relationship between entities is implemented using pointers, which allow the representation of arbitrary relationship (Picture 2)



Picture 2 : Network Design

3. Relational : In relational database, all the shortcomings of the hierarchical and network database management are removed. It is a database in which all the data are stored in relations of one to one as well as one to many. The data is stored in database objects, which are called tables. Relational database model is the basis of structured query language.

Database Structure

The main elements used to prepare the database structure are as follows:

1. Reality : Generally a structure of data is prepared according to the organization's activities in which all the data related to the work should be ensured. For example, accounting is a work, so data related to accounting will be considered.

2. Data : Data is a collection of facts, such as numbers, words, measurements, observations or even just description of things. It includes basic facts and statistics on which decisions can be taken only after further processing.

3. Database : Database is a combination of various data files. It contains various units. The smallest unit is a letter (i.e., 1, 2, 3, 4, a, b, c, d) to be stored in the computer, and data items are created from a group of letters, such as name, address etc. A group of data items is known as record. Such as record of a student contains his roll number, name, subject etc. The sum of the records is called a data file and all the data files are called database.

4. Information : If any decision can be made on the basis of results obtained on processing the data, it is called information. In other word the processed data available for decision making is known as information. If any decision can't be taken on such information then the data will be reprocessed. Information is the final residual of database system

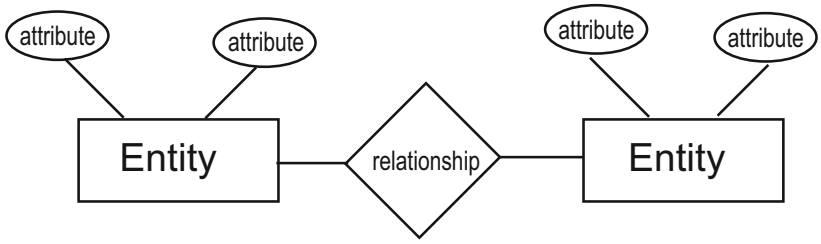
5. Data Base Management System : It is software that operates the entire database in providing information to the required persons. It also assists in finding out some specific information through query from the database. The data base management system is helpful in storing data in the database, preparing their structure, removing unnecessary data, processing for desired results, and arranging data in accordance with the requirement, etc.

6. Data Model : Data is a collection of facts. The data provides information to users according to their use. Data Model defines the dynamic structure of DBMS. Database within a system, defines how the data are interconnected.

7. Entity Relationship Model : Entity relationship model is based on attributes of the model. Entity is an object based on a particular person or a thing. For example patient is an entity in a hospital's database and its attributes are his name, date of birth, father's name, date of hospitalization in this hospital, name of disease, etc. The ER model is based on:

Entity and its attributes

The interrelation between entities : can be explained as under (Figure 3) :



Picture 3 : Entity Relationship Model

(i) Entity : The structure of the actual conditions based on the particular object is termed as Entity of ER model. An entity is a single person, place, or thing about which data can be stored. In DBMS, an entity is some unit of data that can be classified and have stated relationships to other entities. Its characteristics are known as attributes. Entity can be an object with physical existence, such as, house or a non-existent entity. For examples accounting entity may be accounts, employees, types of accounts and supporting documents. Accounting data is prepared by entity. Example of an entity can be understood with the help of college database where student is an entity and its attributes are name, father's name, birth date, gender, class etc.

(ii) Relation : The relationship between object or entity is the connection or association between them that affects each other. Relationships can be depicted in multiple forms with entities. Such relations should be logical or rational in nature. This relationship can be between two entities. In addition, the relationship between two or more entities demonstrates that there is a mutual relationship between the respective entities. Existence of relationship between two entities is possible in many ways. As shown in the diagram: (Figure 4)

One to one 1 : 1	Entity	1	Relationship	1	Entity
One to Many 1 : N	Entity	1	Relationship	*	Entity
Many to one N: 1	Entity	*	Relationship	1	Entity
Many to Many 1 : 1	Entity	*	Relationship	*	Entity

Picture 4 : Types of Relationship Between Two Entities

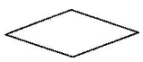
Note : In the above table 1 means one and * means many

(iii) Entity Relationship : Entity model concept is used in most database applications. The structure of entity relationship model is used of the major components of model entity, feature identifier, and ties to reality. The format of the database can be understood by the model's signals. An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is a component of data. In other words, ER diagrams illustrate the logical structure of databases .The following signals are used to express various types of entity symptoms, identities and relationships used for construction of ER diagram :

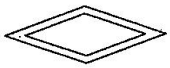
An entity is represented by a rectangle which contains the entity's name.

Weak entity is doubled line rectangle

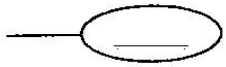
Relationship

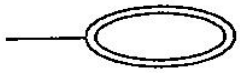


Identification of relationship



Attribute 

Key attribute 

Multivalued attribute: An attribute that can have many values. 

Derived attribute: An attribute whose value is calculated (derived) from other attributes. 

(iv) Identifier: The database object name is referred to as its identifier. All entity types have the same kind of properties but have a different value, so that the identity of the entity is mentioned. For example, the roll number is a student entity type, which has a code number by which a particular student is identified.

(v) Weak entity : An entity that cannot be uniquely identified by its attributes alone. The existence of a weak entity is dependent upon another entity called the owner entity. The weak entity's identifier is a combination of the identifier of the owner entity and the partial key of the weak entity. Some entities may have more than one property. This type of entity that does not have any major property.

(vi) Attribute : A quality of any object that explains about that entity is known as attribute. For example in case of a person it may be the height, weight and birth date, all the qualities applied to the person. In case of accounting, the accounting code and name of the account etc. Every entity has an attribute that represents that entity, which is stored in the database in the form of data.

Types of Attributes

(a) Simple attribute : Simple attribute cannot be divided. For example the units produced by a machine in one year, have a general quality.

(b) Mixed attribute: This attribute is divided into some smaller subdivisions. Their quality reveals its original meaning. For example fixed assets are a mixed quality. There can be several types of permanent assets.

(c) Single value attribute : The attribute that has value in a single unit is called a single attribute. Just like a company's net profit of one year is a single value attribute.

(d) Multi value attribute : Such qualities which have more than one value for one unit are called multi-value attributes. For example, the qualifications of an employee employed in a company are valuable properties.

(e) Compound attribute : In this, two or more properties are related to each other in such a way that one attribute is dependent over the main attribute.

Database in Accounting

Various types of data are used in accounting process. The amount of accounting data depends on what is the format of business and the manner in which transaction are recorded. If there is a sole proprietary concern, then the number of data required will be limited due to which the accounting transaction will be less in comparison to partnership firm and company.

Structure of Accounting Database :

Computerized accounting information system is dependent on data storage of accounting records. For this purpose an entire structure of accounting data structure is designed with well assigned entity and attributes with clear establishment of relationship between them. As explained earlier, the database is used for the storage of

accounting data. The process of drafting (for accounting) starts with the process of reality (the reality of accounting), which is expressed as the concept of data format elements.

(i) **Reality :** It refers to the real world situation for certain aspects in which database management system will be operated. In the context of accounting through database management , this is the first step of accounting, which is expressed with full description.

- The accounting transaction of a business is documented through a Voucher.
- Each voucher has a serial number that starts with '01', as well as it indicates that it is the first voucher of the accounting period. Only simple voucher is used to document the transaction.
- On every voucher, the date of the transaction, account number, both the income-expenditure entries with the code are used.
- Each accounting voucher shows the amount of accounting transaction.
- Supported documents such as bills, receipts, contracts etc., are also attached to the accounting voucher.
- Each account is prepared by a certain employee and is authorized by another employee.
- Each accounting is classified into an account type - expenses, income, assets and liabilities.

(ii) **Entity Relationship Scheme:** It is formally presented with the blue print of illustrated presentation, in which the entity relationship is established. It is a design used to present the description of reality.

(iii) **Relational Data Model:** This model explains the relationship between the databases in a group. It is based on the entity relationship design. In other words it represents the database in the form of collections of relations in the form of data tables. Row of the tables depict the collection of related data. Each row of a table is called a record. The values in columns are called data type.

(iv) **Normalization:** It is used to remove the process of refining duplicate, unused and unclean data in the database. It reduces the possibility of duplicate and terminated data.

Data Processing Cycle

The computerized accounting process involves identifying, storing and retrieving data of an accounting transaction. This requires a process that stores data related to accounting in such a way that they can be retrieved as necessary. It can be obtained by preparing appropriate data base for accounting. The data processing steps include data seizing, data input, manipulating and generating the information for the user of information. The data are internally attached in the data inventories in such a way that it insures consistency and integrity of the data . Before understanding the data base format dynamic, the data processing cycle should be explained in terms of accounting. Accounting data is the data that is extracted from, and with which the accounts are prepared. This data is used through a certain process. The order of this process is called the data (Accounting) process cycle. It involves collection, classification, relation and calculation of the data in way, which makes it easy for accounting decisions in the best possible manner. Information in financial statements is converted from different levels and presented in the final order. These levels are as follows -

(i) **Sources :** The first step in data processing cycle is the preparation of voucher. It is a document that is prepared for accounting so that the accounting process can be done in a sequential manner. All the information related to accounting is available in these vouchers.

(ii) **Inserting the data :** The accounting data collected is entered in computer. Accounting statistics is available to the providers through the computer's storage device. The data entry form is formatted in such a way that it is similar to the physical voucher. The data entry is made through software in a prescribed format.

(iii) **Storage Data :** A data structure is needed to store the data in which the composition of the account's nature, the name of the account and the codification of the category of the account have to be written. Storage data is the only part of data accumulation. The format of data storage is as follows: (Figure 5)

Code	Name	Type of Account

Picture 5 : Data Storage (Entity type)

The above mentioned data record is used to store the items related to the account code, account name and account class items. As explained below : (Picture 6)

Code	Name	Type
120001	Capital Account	4
150001	Purchase Account	1
160001	Sales Account	3
170001	Assets Account	2
180001	Libility Account	5

Picture 6 : Type of Accounts

In the above table, type-4 liabilities, 1 expense 3 sales, 2 asset and 5 liabilities. The data storage structure (also called data table) for accounting is generated as part of the data base structure.

(iv) Data manipulation : The final report is prepared by making necessary changes to the compiled data. These types of data can be compiled separately and can be used in the preparation of final reports. Alternatively, manipulated data can be presented in the form of final report.

(v) Data Output : Using the manipulated data, accounting reports can be obtained according to the preformed format. The data output in the form of accounting reports may be in the form of trial balance, profit and loss account etc.

Entity and attributes of accounting

1. Types of Accounts : This is a conceptual entity that is meant to express types of account of the accounting system. Class (ID) is an account type of entity, through which the classified accounts are identified.

2. Account : Account is an entity that expresses various types of accounts. Name of the account is the category of account. (Picture 7)

S.No.	Entity Type	Attributes
1.	Accounts Type	Category-ID
2.	Accounts	Code, Name, Type
3.	Emloyees	Employees ID, First Name, Middle Name, Last Name, Category IA
4.	Voucher	Date, Number, Income, Expenses, Debit, Credit, Authorised by, Prepared by
5.	Support Document	S.No., Name, Date

Picture 7 : Attributes of Accounting Entity

3. Employee : The employee is a physical entity by which various types of employees are concerned with the accounting system. Any employee can be identified by the employee identification (ID).The ID expresses the

employee's first name, middle name, last name. Super ID Expresses the identity of the superior of the employee.

4. **Vouchers:** This is an entity which provides the structure of transaction data.
5. **Support Document:** These are the facts that express the various types of supporting documents that are attached to the authenticity of the transaction of an account.
6. **Date:** The serial number expresses the sequence number in the supporting document attached to the attributes. The document expresses the date and the name expresses the name of the account which is attached to the voucher.
7. **Entity type and entity group:** Entity type is the collection of entities that hold some common features with reference to their attributes. Each entity type is given a name for its identification. Attributes of entity types are described in the data base. The value of the attribute of an entity, which is in the form of entity type, is called an entity instance. Example (11001 Capital Account 4) is an entity reference, whose code is 11001, Name - Capital Account and Type is 4)
8. **Entity group:** It is a collection of all entity instances of each entity type. An entity type is described in the set of attributes called schema. The set of entity related to particular entity type share the same set of attributes. The collection of entities of a particular entity is grouped into entity set, called the extension of entity type. (Picture 8 and 9)

Code	Name	Type

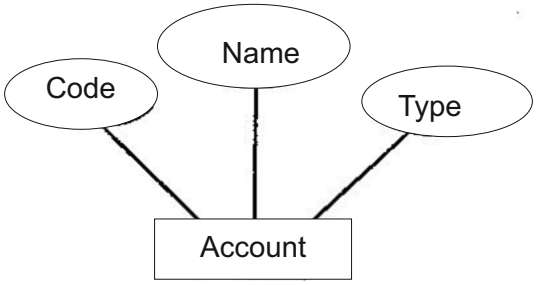
Picture 8: Structure of type of Entity

11001	Capital Accounts	4
221019	Jain Com.	4
221020	Jairam Brothers	4

Picture 9: Entity Type & Entity Group

Identifier : Nearly all the entity type is one kind of attribute, which has a unique value. Thereby identifies the entity instance. For example, roll number of a student is an attribute of entity type (student) with a unique value through which a student is identified. In the same way code is an important attribute of an entity type (Accounts) since it represents a unique data value that separates it from other data values.

Accounting database : In accounting, accounts of transactions are divided into just four categories. Expenditure, Earnings, Property and Liability. According to the rules and procedures of accounting, the first entry of a transaction is made first. After that, posting is done in his accounts. The balance of the accounts is transferred to the plumbing. Benefit-loss account and blog are created from Talpath. For example, if the loan of five thousand rupees is sold to Sunil, then the journal entry will be written through voucher. Its entry in the General will be as follows. (Picture 10)



Picture 10: Account code of Account and Attributes

There are some instances where two or more attributes, together constitute some different values. For example, a school requires a composite key (sub class and roll no.) for its entity type (student) . The object does not

allow any two entities of same value in any form at the same time for its attribute. Some entities can have more than one main attribute. The type of entity that has no main attribute is called weak entity. (Picture 11 & 12)

Sunil A/c Dr	5000	
To Sales A/c		5000
(goods sold to sunil)		

Picture 11: Entry in Journal

Voucher Entry

M/s Dinesh and Company

Transaction Voucher

Vourchers No. 05 : Date : 10 April, 2015
Account Name 69001 : Sunil Account
Credit Account 69002 : Sales Account
Amount Rs. : 500000

Authorised by - Vivek Prepared by - Ravi

Picture 12 : Voucher entry one debit one credit

The same transaction can be also processed through a credit voucher in multiple credits against a single debit. It can be illustrated as under: (Picutre 13)

Credit Voucher

Voucher No. 05 Date: 01 April, 2016
Account Name : 69001 Bank Accounts : M/s Ideal Computers

Credit Account

Serial No.	Code	Name of Account	Amount	Naration
1.	69002	Purchase Account	5,00,001	Goods Sold
		Total	5,00,001	

Autorized by - Vivek Prepared by - Ravi

Picture 13 : Voucher for multiple credits and one debit

Now look at the following transactions: M/s S.K. and Sons purchased a machine worth Rs 10000 on April 5, 2016 , from, M/s P.K. and Sons and paid Rs 500 as freight to M/s Sharma Transport. This transaction involves multiple debit accounts and a single credit account. The debit voucher used for this transaction will be prepared as follows (Picutre 14):

Debit Voucher

Voucher No. : 10 Date : 05 April, 2016
Credit Account : 642001 Bank A/c. S.K. and sons.

Expenses Account

S. No.	Code	Name	Amount	Naration
1.	711004	Purchase A/c	10000	Purchase form P.K. & Sons
2.	711034	Carriage	500	Carriage charge paid to M/s Sharma Transport
		Total	10501	

Authorized by : Vivek Prepared by : Ravi

Picture 14: Voucher for multiple debits against one credit

The accounting database can be explained by an example. In an accounting process, there are data related to the relevant voucher's supporting documents, ledger accounts and database related to employees, debtors, transactions, bank to record the transaction. From this database, the transaction has to be recorded in accounts and related reports. For instance in case goods sold to Rakesh, then Rakesh, will be debtor and his name will be stored in the list of debtors, through the database before passing the entry. Similarly, the data of which is the source of revenue through sales will be prepared. The effect of the sale will be on the stock, so the data of the stock will also be stored in the database structure. It can be understood by the following transactions.

Date	**Transaction**
1 June,2016	Started business with cash 10,000
1 June,2016	Rs. 25,000 deposited in Bank
5 June,2016	Goods purchased Rs. 10000
10June,2016	Purchase goods for Rs. 8000 amount paid by Cheque No. 89654
15June,2016	Salary paid Rs. 10000
30June,2016	Purchased goods from Dinesh for Rs. 10000
30June,2016	Rs. 5000 paid as carriage

The structure of database will be as under : (Picutre 15, 16, 17, 18 and 19)

Name	Fathers' Name	I.D.	Dept. I.D.
Sunil Kranti	Dinesh Rohit	S002 K002	MK08
Ramesh Vikas Yogesh	Vimal Sharma Suresh Doshi Gopal Singh	R001 V001 Y003	FN08

Picture 15: Database of employees

Voucher No.	Debit	Rs.	Date	Credit	Transation
005	65001	100000	1 June, 2016	63002	Started Business
006	64001	25000	1 June, 2016	65001	Deposit at Bank
007	66001	10000	5 June, 2016	66001	Purchased goods
008	66001	8000	10June, 2016	64002	Purchased goods
009	67001	10000	15 June,2016	64002	Paid Salary
010	66001	10000	30June,2016	67002	Purchased from dinesh
011	69001	5000	30June,2016	64001	Paid carriage invered

Picture 16 : Vouchers

Voucher No.	S. No.	Supporting Documents
006	1	Bank Receipt
007	1	Invoice
008	1	Invoice
009	1	Signature on Register
010	1	Invoice

Picture 17: Supporting documents and accounts

Code	Name	Type ID
65001	Cash Account	3
63002	Capital Account	4
64001	Bank Account	3
66001	Purchase account	1
67001	Salary Account	1
67002	Dinesh account	2
69001	Carriage Account	1

Picture 18 : Accounts

Type ID	Classification
1	Expenditure
2	Libilities
3	Assets
4	Capital
5	Income

Picture 19: Type of accounts

All the above mentioned transactions have been coded. These have been classified according to the type of accounts classified.

Disadvantages of DBMS

1. **High Cost:** D.B.M.S. is based on computer programming. Costs arise in creating this program. This cost is in addition to the normal cost that is incurred in the business. If an organization wants to implement this system, then it has to pay for its installation and maintenance. It is difficult for every business entity to afford this cost.
2. **Skilled Employees:** Operating DBMS requires highly trained professionals and skilled personnel. The employees working in the current system need training and regular upgradation after the installation of DBMS. Ongoing training is essential for the employees.
3. **Complexity :** The main pillar of DBMS database, which stores and operates data. Sometimes data are collected which are not required. Different types of users may have trouble using data because there might be certain ambiguity in data usage

Microsoft Access

This software controls and regulates data base management system. The process of collecting, controlling, transferring, etc. of data is effectively implemented from this software system. Access elements are used by various types of business organizations, for the convenience of their business. These elements have been created keeping in mind the user's objectives. The elements of access are defined as follows. Every element which is created using access is an object and all other objects constitute a class. Access is available with the following object classes:

Elements of MS Access

(i) **Table:** This object class convert database format into data table. It includes their respective fieldname, data type and properties.

(ii) **Queries:** It is meant to create the Structured Query Language well-matched query statement with or without the use of graphic user interface to define tables, store data and retrieve data and information.

(iii) **Forms:** This is done by creating user interface. This helps the user to use the back end database.

(iv) **Reports:** This object class is used to prepare various types of report. Their information is based on source tables, queries, or both. Such reports are made in access as per the end user's requirement.

(v) **Page:** This object class creates data access pages that can be sent to any organization's website with the use of internet, or by e-mail to users' networks.

(vi) **Macros:** In macro programming, macro based actions(individual instructions) are manipulated.A macro is a list of macro oriented actions that run a unit.

(vii) **Modules :** These are the main sizes for any application, and formats can help them prepare a group of programming instructions called functions. Similar modifiers are made through access.

The object class is contained in the named database file of Access with MBD extension. Whenever this file is opened then a database window is displayed. Among these, all the above mentioned objectives are open with the left side. Whenever special objects are created, then they get listed on the right side on this window against each of the object class.

Efficiencies of MS Access

Access has special utilities, which can be implemented in any type of organization. Its main functions are as follows:

- Systematic storage
- Representing complex relationships between data.
- The database prohibits unauthorized users from accessing.
- Allows Structured Query to retrieve the data with or without its speed.
- Creates intermediate interfaces of multiple users
- Shares data.
- Promotes multimedia data and information.

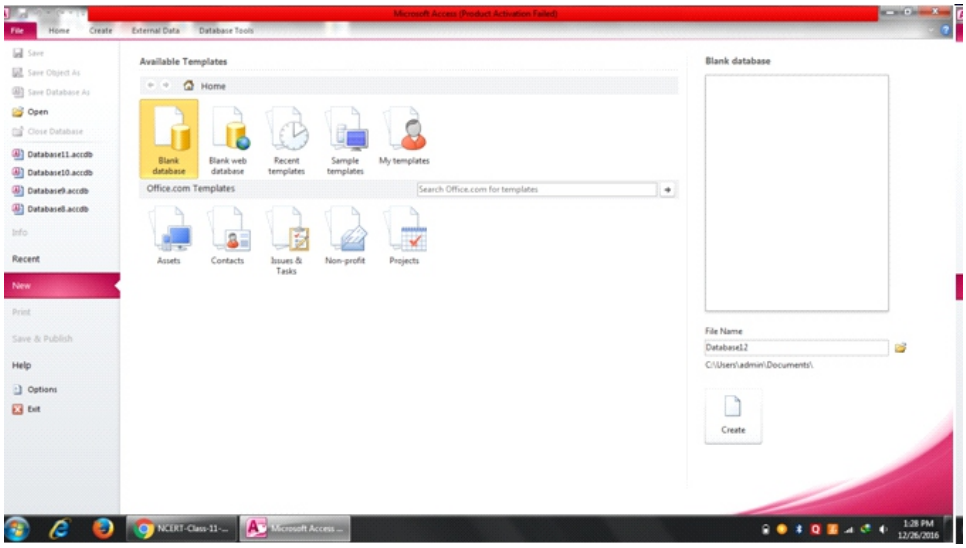
Database in Access

When a new database is created from inception, there is full control over the objects of the database, their properties and the relationships. In order to create a new database (this process is an automatic process) it is necessary to follow the following steps:

(i) To select an empty access database, open the access window and select OK. Click the button.

(ii) The Access file database will display the dialog box, in which the designer must type the name of the file and the name of the database, after which the Create button must be clicked.

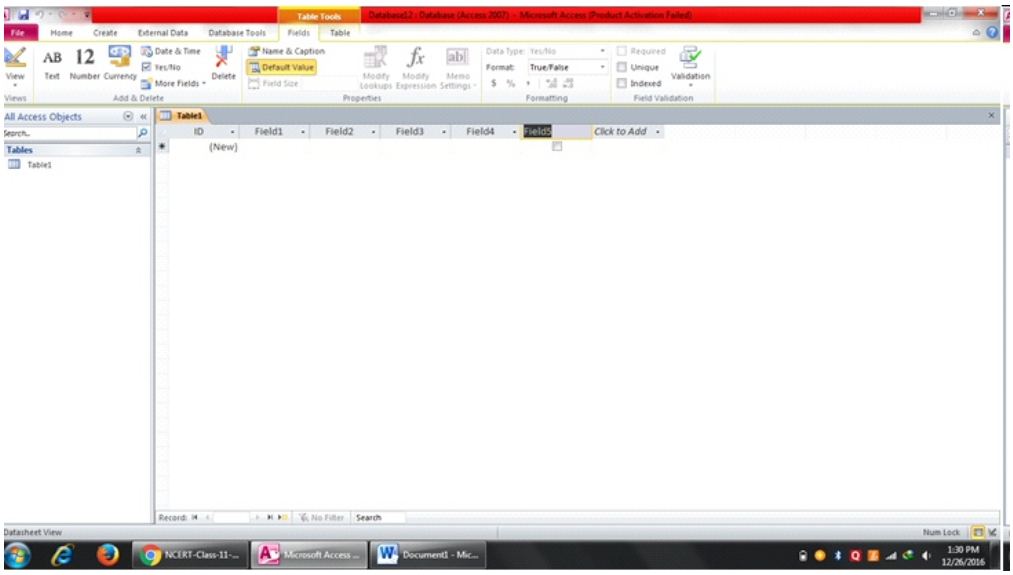
If the task pane does not open, then go to the file from the menu list and click on 'New' to create a new database. The file that opens the access file is displayed in picture 20.



Picture 20: Creating a new file in a window

Creating tables in access :

To create tables in access, it is necessary to understand the following components of the table object. Click on the tables object in Access, Make a double click at “create table by design view”, which will provide a table window, which consists of three column areas: Field Name, Data type and Description. They define the plans (schemas) of the tables that are being created. Each of its rows corresponds to the column of the table to be made. The column of a table has field name and data type as its major parts. The file window is displayed as under: (Picutre 21)



Picture 21: File creation window

Field Name: This is the column name of the table. The name of the column should be a string of contiguous characters. The field name defines the name of the column to be created, followed by data type of such column. The designer can also opt to provide description of the column. After defining the data type, the designer can further define the properties of each column in the lower part of the table window.

Data type: Access supports different data types, which are described below:

Text: It is used for string of characters, letters, words or numbers that are not be used in any arithmetical calculations.

Memo: It is used to store comments and adjust the character. But the data type cannot be agreeable for sorting or filtering of data records.

Number: It is used to store the numbers, that may be integers (-32768 to 32767) long integers (-2, 147, 483, 648 to 2, 147, 883, 647), bytes (0-255) , Single (storage of values with a decimal point up to a certain extent), double (values in decimal point in greater magnitude).

Date / Time: It is used to store date and time or combination of both.

Currency: It is used to store numbers in terms of, rupees, pound, dollar and other currencies of various countries.

Auto Number: This is numerical data which is inserted automatically by Access. It has special significance in situation where, none of the fields individually or a set of fields as a combination in a table is unique.

Hyperlink : It is meant to store a Universal Resource Locator (URL) and email addresses.

Structured Query Language

In database management system a standard computer language is used for data manipulation. Such language is required by the user to get the information by placing a request to the database. It is called the Structured Query Language. When some data is to be deleted, added and changed, then it is processed through query.SQL is

used to query, insert, update and modify the data. Answer can be found for any type of special questions related to the database by using the query. Query is an inquiry into the database through certain specific statement. By looking at the database table, it is not possible to remove the data directly from it. Data can be filtered by query and can be calculated and summarized. The functions of data management can be automated through the query. Before any changes in data, data can be reviewed before making any specific changes. The user can write the statement in the form of a data base application that can access data stored in two or more relational database management systems. It is also capable of defining user oriented views of database and also specify security and authorisation.

The original version of structured query language was SEQUEL(Structured English Query Language) that was designed by IBM research center.

Functions of SQL

- It performs data manipulation.
- It displays the query.
- It can Inserts the records.
- It can delete the records.
- It can update the records.

Table

The database is prepared through the data table. A database can contain more than one table. (Picutre 22)

Customer ID	Name	Address	City	Pincode

Picture 22: Format of Table

Basic Queries in SQL : Data Query Language (DQL) as a sub set of SQL is generally used to answer most of the basic queries. The basic form of query is the usage of SELECT-FROM-WHERE**. This** structure is used as described under:

SELECT : This clause is used to locate or specify the data or information that is desired to answer the query

FROM : It is used to specify the source of data for answering the query.

WHERE : It is used to specify the condition that are used to specify or narrow down the choice of data to extract the information chosen in select clause.

SQL Statement : Select statement is used to select the specific data from a given database.For example, if a data is to be selected from a database table the following syntax command will be used: (Picutre 23)

SELECT column-NAME from Table NAME

Employee			
Employee ID	First Name	Last Name	Address
001	Anil	Sharma	25, Adarsh Nagar
002	Sunil	Khandelwal	8, Amal Park
003	Rajat	Sharma	10, Apex Avenue
004	Sunder	Agarwal	7, Smart Nagar

Picture 23 : Table of Employees

From the above table if we want to retrieve the record of the person with an ID of 002 then SQL command will be:

SELECT

FROM Employee(Employee is name of table)

WHERE Employee ID=002

This language is specifically designed to work as per the instructions of user for various data related work.

Summary

Database management system provides information for management decisions through various types of data.

All the data are arranged by converting them into the information required according to the database management system. This system is a group of programs created to use co-related data. Its purpose is to collect data through the software and to do its management as per the requirement of the user.

The main function of the database management system is to provide a way to recover data from different types of data through appropriate media. As the information of students studying in a school can be stored in the form of name, roll no. section, marks etc. Structured Query Language is used to remove, modify and retrieve data from database. It has major importance in accounting.

Questions for Exercise

Multiple Choice Questions :

1. Data is ?
   (a) Notice (b) Collection of facts (c) a and b both (d) None of the above
2. Information is ?
   (a) Meaning of Data (b) The origin of Data (c) Data (d) None of the above
3. The result of processed information is ?
   (a) Input (b) Output (c) Both of the above (d) None of the above
4. The method of preparation of query in the following is ?
   (a) SQL (b) JHL (C) RST (d) DBM
5. The full name of DBMS is ?
   (a) Database Markup System (b) Database Management System
   (c) Database Management Section (d) None of the above
6. The demerit of the database is ?
   (a) Repetition of data (b) Data discrepancy
   (c) Difficulty in retrieving data (d) None of the above

Very Short Answer type question :

1. What is data?
2. What is data processing?
3. Define Structured Query.
4. What is ER Model?
5. What do you understand from the relation in DBMS?
6. What is information?
7. Define Query.

Short Answer type questions :

1. Explain the data processing cycle with the view of accounting.
2. What is accounting data?
3. Explain the database management system in detail.
4. Explain the following words with examples-
   a) Entity b) Attribute c) Relational
5. Explain the ER model in detail.
6. What do you understand from the database? Compare it to the traditional file handling system.

Answers of Multiple Choice Questions

Question No.	1	2	3	4	5	6
Answer	b	a	b	a	b	d