ਜਗਤ ਗੁਰੂ ਨਾਨਕ ਦੇਵ
ਪੰਜਾਬ ਸਟੇਟ ਓਪਨ ਯੂਨੀਵਰਸਿਟੀ
ਪਟਿਆਲਾ

The Motto of the University

(SEWA)

SKILL ENHANCEMENT

EMPLOYABILITY

WISDOM

ACCESSIBILITY

JAGAT GURU NANAK DEV
PUNJAB STATE OPEN UNIVERSITY, PATIALA

(Established by Act No. 19 of 2019 of the Legislature of State of Punjab)

MASTER OF COMMERCE

(M.Com)

SEMESTER-II

MCMM21201T
COMPUTER APPLICATIONS IN ACCOUNTING

Head Quarter: C/28, The Lower Mall, Patiala-147001

Website: www.psou.ac.in

The Study Material has been prepared exclusively under the guidance of Jagat Guru Nanak Dev Punjab State Open University, Patiala, as per the syllabi prepared by Committee of Experts and approved by the Academic Council.

JAGAT GURU NANAK DEV PUNJAB STATE OPEN UNIVERSITY, PATIALA
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COURSE COORDINATOR AND EDITOR:

Dr. Pinky Sra

Assistant Professor

JGND PSOU, Patiala

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PREFACE

Jagat Guru Nanak Dev Punjab State Open University, Patiala was established in December 2019 by Act 19 of the Legislature of State of Punjab. It is the first and only Open University of the State, entrusted with the responsibility of making higher education accessible to all, especially to those sections of society who do not have the means, time or opportunity to pursue regular education.

In keeping with the nature of an Open University, this University provides a flexible education system to suit every need. The time given to complete a programme is double the duration of a regular mode programme. Well-designed study material has been prepared in consultation with experts in their respective fields.

The University offers programmes which have been designed to provide relevant, skill-based and employability-enhancing education. The study material provided in this booklet is self-instructional, with self-assessment exercises, and recommendations for further readings. The syllabus has been divided in sections, and provided as units for simplification.

The Learner Support Centres/Study Centres are located in the Government and Government aided colleges of Punjab, to enable students to make use of reading facilities, and for curriculum-based counselling and practicals. We, at the University, welcome you to be a part of this institution of knowledge.

Prof. G.S Batra
Dean Academic Affairs

M.COM

SEMESTER-II

(MCMM21201T): COMPUTER APPLICATIONS IN ACCOUNTING

MAX. MARKS: 100
EXTERNAL: 70
INTERNAL: 30
PASS: 40 %
Credits:6

Objective: To provide computer skills and knowledge for commerce students and to enhance the student understands of usefulness of information technology tools for business operations.

INSTRUCTIONS FOR THE PAPER SETTER/EXAMINER:

1. The syllabus prescribed should be strictly adhered to.
2. The question paper will consist of three sections: A, B, and C. Sections A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. The candidates will attempt two questions from each section.
3. Section C will have fifteen short answer questions covering the entire syllabus. Each question will carry 3 marks. Candidates will attempt any ten questions from this section.
4. The examiner shall give a clear instruction to the candidates to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.
5. The duration of each paper will be three hours.

INSTRUCTIONS FOR THE CANDIDATES:

Candidates are required to attempt any two questions each from the sections A and B of the question paper and any ten short questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

SECTION A

Computer Fundamentals

Unit -1 Introduction to Computer, Windows Operating System **(Dr. Monika)**

Unit -2 MS Word, MS PowerPoint and MS Excel **(Dr. Monika)**

Computerised Accounting

Unit-3 Computer and Computerized Accounting System **(Outside)**

Unit-4 Electronics Spreadsheet, Use of Spreadsheet in Business Application **(Outside)**

Application of Computer in Financial Accounting

Unit-5 Graphs and Chart -I **(Outside)**

Unit-6 Graphs and Chart –II Graphs and Chart –III **(Outside)**

SECTION B

Management Information System

Unit -7 Management Information System: Basic Concepts **(Outside)**

Unit -8 MIS Applications in Organization **(Outside)**

Unit -9 MIS Issues and Challenges **(Outside)**

Database Management System in Accounting

Unit-10 Introduction of Database Management **(Dr. Monika)**

Unit-11 Introduction to Accounting **(Outside)**

Unit-12 Accounting System using Database Management System **(Outside)**

Suggested Reading:

1. Hunt, R., J. Shelley, Computers and Commonsense, Prentice Hall of India.
2. Sinha, Pradeep K. and Preeti Sinha, Foundation of Computing, BPB Publication.
3. Saxena, Sanjay, A First Course in Computers, Vikas Publishing House.
4. Leon A. & Leon M., Introduction to Computers, Leon Vikas Publications
5. N. Subramanian, Introduction to Computers, Tata McGraw-Hill.
6. Peter Nortorn, Introduction to Computers, Seventh Edition

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Master of Commerce

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SEMESTER-II

(MCMM21201T): COMPUTER APPLICATIONS IN ACCOUNTING

SECTION A

UNIT NO.	UNIT NAME
UNIT 1	**Introduction to Computer**
UNIT 2	**MS Word, MS PowerPoint and MS Excel**
UNIT 3	**Computer and Computerised Accounting System**
UNIT 4	**Electronics Spreadsheet, Use of Spreadsheet in Business Application**
UNIT 5	**Graphs and Chart –I**
UNIT 6	**Graphs and Chart –II Graphs and Chart –III**

SECTION B

UNIT No.	UNIT NAME
UNIT 7	Management Information System: Basic Concepts
UNIT 8	**MIS Applications in Organization**
UNIT 9	MIS Issues and Challenges
UNIT 10	**Introduction of Database Management**
UNIT 11	**Introduction to Accounting**
UNIT 12	**Accounting System using Database Management System**

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SEMESTER II

Course: Computer Applications in Accounting

UNIT 1: Introduction of Computer & Windows Operating System

1.1 WHAT IS COMPUTER

The word "Computer" comes from the word "Compute", which means, "to calculate".

In a layman language, a computer is a fast calculating device that can perform arithmetic operations. Although the computer was originally invented mainly for doing high speed and accurate calculation, it is not just a calculating device. The computer can perform any fiend of work involving arithmetic and logical operations are data. It gets the data through an input device processes at as per the intuitions given and gives the information as output. We can define a computer as follows:-

A computer is a fast electronic device that processes the input data according to the instructions given by the programmer/ uses and provides the desired information as output.

More accurately we can define a computer as a device that operates upon data.

1.2 CHARACTERISTICS OF COMPUTER

Increasing popularity of computers has proved that it is powerful and useful tool the power and usefulness of this popular tool are mainly due to its following characteristics.

1) **Automatic :-** Computers are automatic machines because once started on a job they carry out the job normally any human assistance until it is finished. However, computers being

machines cannot start them solves and cannot go out and find there own problems and solutions we need to instruct a computer using coded instructions that spicily exactly how it will do a particular job.

2) **Speed :-** A computer is a very fast device. It amount of work that a human being can do in on entire year.

A powerful computer is capable of performing several billing $(10)^9$ single arithmetic operations per second.

3) **Accuracy :-** In addition to being very fast computer are very accurate. accuracy of a computer is consistently right and degree of its accuracy depends upon its deign. A computer performs every calculation with the same accuracy.

However errors can occur in a computer these errors ore mainly due to human rather than technological weaknesses.

4) **Diligence:-** Unlike human beings, a computer is fire from monotony, tiredness and lack of concentration. It can continuously work for hours without creating any error and without rumbling. It ten million calculation rave to be performed a computer will perform the last one with exactly the same accuracy and speed as the first one.

5) **Versatility :-**Versatility is one of the most computer. One moment it is preparing results of an examination next moment it is busy preparing electricity bills and in between, it may be helping an office secretary to trace an impotent letter in seconds in brief a computer is capable of performing almost any task.

6) **Power of Remembering:-** As a human being acquires new knowledge his/her brain subconscious selects what it feels to be important and worth retaining in memory. The brain relegates unimportant details to back of mint or just forgets them. This is not the case with computers. A computers can store and recall any amount of information because of its secondary storage ca type of detachable memory capability.

7) **No IQ:-** A computer is not a magical deice it possesses no intelligence of its own its I.Q. is zero, at least until today. It has to be told what to do and in what sequence. A computer cannot take its own decision in this regard.

8) **No feelings :-** Computers are devoid of emotions they are machines. No Computers possesses the equivalent at a human heart and soul. Based on our feelings tests, knowledge , and experience we often make certain judgments in our day to day life but computer make judgments based on the instructions given to them in the form of program that are written by is chairman beings.

1.3 USE OF COMPUTERS :-

Computers our being used in many areas application like business, industry, scientific research, Defense, Space, Communications, medicine, education etc. The utilization of computers in different fields is summarized as follows:-

1) **Scientific Research:-** Used to resolve complex scientific problems accurately in a short time.
2) **Industry:-** Used in electricity, steel, paper, printing, engineering and other industries for production.
3) **Business:-** Used in banks airports, hotels export hones, Govt. offices and other for computer sing business applications like financial accounting etc.
4) **Defense:-** Used to computers liver planes ships, radars etc.
5) **Space :-**Used to design computerised space satellites rockets and related technology.
6) **Data Communication:-** Used to computers geo- graplrically separated offices through networking.
7) **Telecommunication :-** Used in E-mail, Internet, Video Conferencing, Cellular phones etc.
8) **Medicine :-** Used in hospitals and nursing home/clinics for maintain medical records, prescription writing and computerised scanning etc.
9) **Education:-** Used in development of CBT (Computer Bored Teaching programmers for education.
10) **Law and order:-** Used to records data of vehicles criminals finger prints etc.
11) **Libraries :-** Used to develop library management systems.
12) **Publishers -** Used for designing and printing of books.
13) **Engineering :-** Used for CAD (Computer sided designing by engineering companies.
14) **Emerging Technologies** :- Used in Artificial Intelligence like Robotics.

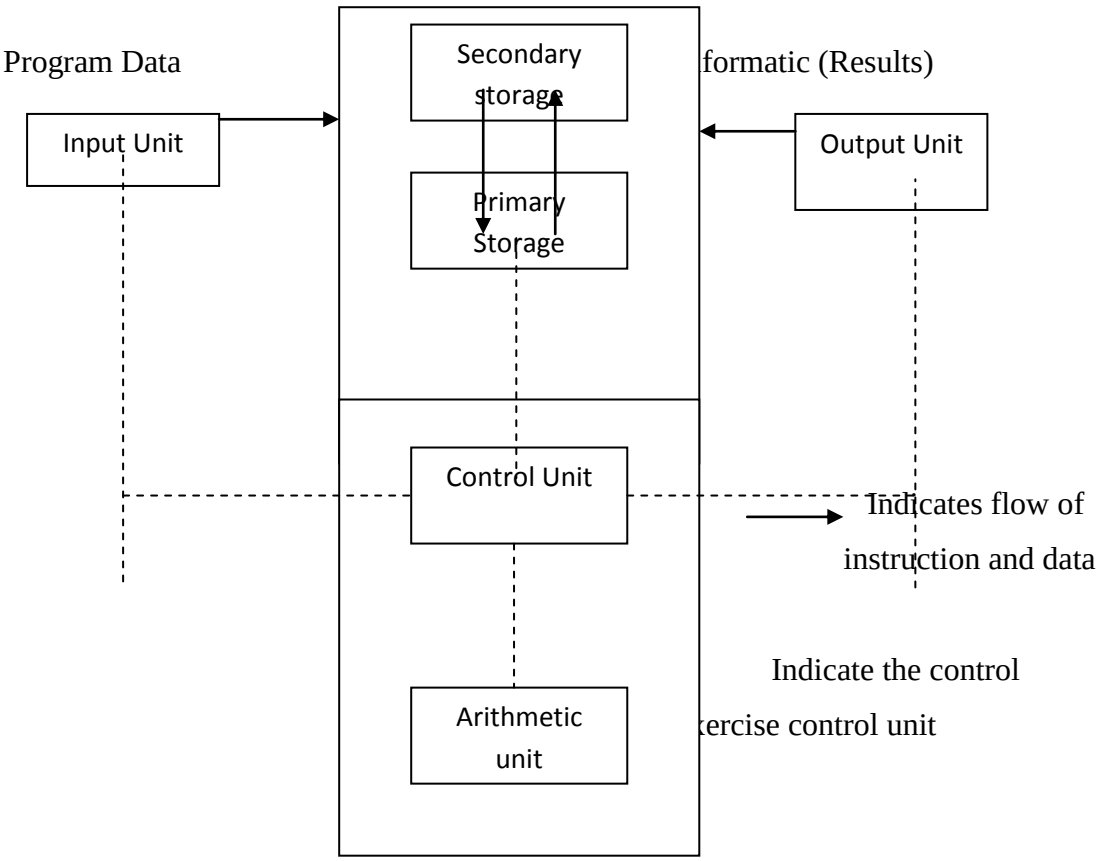
1.4 BLOCK DIAGRAM OF COMPUTER:-

Computer has following components:-

1) Input unit
2) Output unit
3) Storage Unit
4) Arithmetic logic unit
5) Control Unit
6) Central Processing Unit.

The block diagram of basic computers organisation is as follows: this figure, solid lines indicate flow of instruction and data and doled lines represent control exercised by

control unit. These units correspond to the basic operations performed by all computer systems.



1) **Input Unit:-** Data and instructing must enter a computer system before the computer can perform any computations enter a computer through an input unit in a form that depends upon the input device used. Input unit performs the following functions:-

1) It accepts instructions and data from outside world.
2) It convert these instructions and data in computer readable form.
3) It supplies the converted instructions and data to computer system for further.

2) **Output Unit:-** An output unit performs the reverse operation of that of an input unit. It supplies information obtained from data processing to outside word means it present a data in a from people can understand. An output unit performs following functions:-

1) It reads the results produced by a computer, which are in coded from and we cannot easily understand them.
2) It converts these coded results to human readable form.
3) It supplies the converted results to outside world.

3) **Storage Unit:-** Data and instructions entered into a computer system through input units rave to be stored inside the computer before actual processing starts, Similarly, results produced by a computer after processing have to be kept somewhere inside the computer system before being passed on to an output unit storage unit of a computer system caters to all these needs.

A storage unit world:-

1) Data and instructions required for processing received from input devices.
2) Intermediate results of processing.
3) Results for output before they are released to an output device.

Storage unit of all computer is of following two types :-

a. Primary Storage
b. Secondary Storage

a. **Primary Storage :-** Primary storage of computer also known as its main memory.

2) It is used to hold pieces of program instructions and data and intermediate results of processing.
3) However primary storage can hold information only while computer system is on. As soon as the computer system switches off or resets the information held in primary storage is erased.
4) Primary storage normally has limited storage capacity because it is very experience
5) Primary storage of modem computer system is made of semiconductors devices.

b. Secondary Storage:- It is also known as auxiliary storage it is used to takes care of the limitations of primary storage. That is it supplements the limited storage capacity and the volatile characteristic of primary is much cheaper then primary storage and it can retain information even when a computer system switches off or resets.

4) **Arithmetic logic unit:-** It is the place where actual execution of instructions takes tons are performed and all comparisons are made in ALU. Data and instructions stored in primary storage before processing are transferred as and when needed to the ALU. Where processing takes place Intermediate results generated in the ALU are temporarily transferred back to primary storage until needed later. In short, data may move firm primary storage to ALU and back again to storage many times before processing is over.

5) **Control Unit :-**How does the ALU know what should be done with data once they are received? How it is that only results for output are sent to an output device and not the intermediate results? All this is possible due to the control unit of the computer system it does

not perform any actual processing on data. It manages and co-ordinates the entire computer system. It obtains instructions from the program stored in main memory interprets the instructions and issues signals causing other units of the system to execute them.

6) **Central Processing Unit:-** Control unit and arithmetic logic unit of a computer system we together known as central processing unit (CPU) . The CPU is brain of a computer system in a computer system all major calculations and comparisons take place inside the CPU and the CPU is responsible for activating and controlling the operations of other units of the computer system.

1.5 COMPUTER GENERATIONS:-

"Generation" in computer talk is a step in technology. It provides a framework for the growth of computer industry.

There are tonally give computer generation known till today. Generations are major stages in the historical development of computing.

1) **First Generations (1942-1955):-**

First Generation computer used thousands of vacuum tubes. A vacuum tube was a fragile says device which used filaments and could control electronic signals first generation computer were the only high speed electronic device available in these days. These vacuum tube computer could perform computations in milliseconds and known as first generation computers.

All data and instructions were fed into the system from punched cards. Only few specialists understand how to program these early computers. Machine and assembly languages are used.

1) They were too bulky in size, requiring large rooms for installation.
2) First generation computers used thousands of vacuum tubes that emitted large amount of heat. These computers were located has to be properly air conditioned.
3) They were the fastest calculating devices of their time.
4) Power consumption of these computers were very high because each vacuum tube consumed about hey a watt of power.
5) As vacuum tubes used filaments they had a limited life. These computers were prone to frequent hardware failures.
6) Production of these computers was difficult and costly because thousands of components were assembled manually.

2) Second Generation (1955-1964):-

The second generation computers were manufactured using transistors instead of vacuum tubes. Second generations computers were more powerful more reliable less expensive smaller, and cooler to operate than the first generation computers.

Punched cards were still popular and widely used for entering data to these computer high level programming languages (FORTAN, COBOL) were easier for people to understand and work with than assembly or machine languages features:-

1) Second generation computers were more than ten times faster than the first generation computers.
2) They were smaller than first generation computers and required smaller space.
3) They could switch much faster than tubes.
4) They were more reliable than first generation computers.
5) They had faster and larger primary and secondary storage as compared to first generation computers.
6) They consumed less power than first generation computers.
7) They were easier to use than the first generation computers.
8) They were less expensive to produce.

3) Third Generation (1964-1975):-

Computers built using integrated circuits characterized the third generation.

Integrated circuits are circuits consisting of several electronic components like transistors, resistors grown on a single chip of silicon. Were Smaller less expensive to produce more reliable faster in operation dissipated less heat and consumed less power hence, third generation computers were more powerful more reliable less expensive smaller and cooler to operate than second generation computers.

Features:-

1) They are more powerful than second generation computers.
2) They were smaller than second generation computers. Hence requiring smaller space.
3) They consumed less power and dissipated less heat than second generation computers. Third generation computers were located still required to be properly air conditioned.
4) They were more reliable and less prone to hardware failures than second generation computers.
5) These had faster and larger primary and secondary storage as compared to second generation computers.

6) Commercial production of these systems were easier and cheaper because their manufacture did not require manual assembly of individual components.

4) Fourth Generation (1975-1989):-

Fourth generation computers started a new social revolution personal computer (PC) revolution.

During fourth generation memories replaced by large random access memories with very fast access time. Hard disks became cheaper, smaller and larger in capacity. Magnetic takes became very popular as a portable medium for forting data from one computer to another.

Features:-

1) PCs were smaller and cheaper than third generation computers.
2) No air conditioning was required for PCs.
3) They consumed less power than third generation computers.
4) They were more reliable and less prone to hardware failures than third generation computers.
5) They had faster and larger primary and secondary storage as compared to third generation computers.
6) They were general purpose machines.
7) Commercial production of these systems were easier and cheaper because their manufacturing did not require manual assembly of individual components.
8) Programs or data could be easily ported from one computer to another computer.
9) PCs were powerful tool for both office and home usage.

5) Fifth Generation (1989- Present):-

During fifth generation there was tremendous out growth of computer network. Communication technologies become faster day by day and more and more computers were networked together. This trend resulted in emergence and popularity of the Internet and associated technologies and applications. The internet made it possible for computer were sitting across the globe to communicate with each other within minutes by use of e-mail (electronic mail) facility.

Features:-

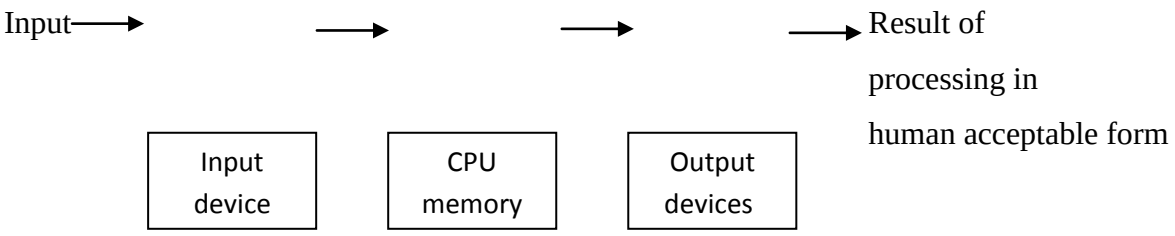
1. Portable computer (Note book computers) are much smaller and handy than PCs of fourth generation computer.
2. Fifth generation computers are several times more powerful than PCs of fourth generation.
3. No air-conditioning is normally required for notebook computers.
4. They consume less power than fourth generation computers.
5. They are more reliable and less prone to hardware failures than fourth generation computers.

6. They have faster and larger primary and secondary storage as compared to fourth generation computers.
7. They are general purpose machines.
8. In fifth generation computers there are computers for almost any type of user whether the user is a child or a scientist.

1.6 INPUT- OUTPUT DEVICES (PERIPHERAL DEVICE):- The computers are useful only when these are able to communicate with users or external environment or operators. For this input and output devices are used. These are also called as peripheral devices jointly. The term peripheral means all devices attached to computer.

Input devices is used to enter data in computer. Output device display data form memory of computer.

Now a dark a variety of input and output device are available. User can use these device according to their need. Some devices are used for Input as welt as output.



(a) **Input devices:-** An input device is an electromechanical device which is used to enter data or instructions from outside to computers main memory.

Input unit performs the following functions:-

1. It accepts instructions and data from outside world.
2. It converts these instructions and data in computer readable form.
3. It supplies the converted instructions and data to computer system for further processing.

Various types of input devices are as follows :-

1. Keyboard
2. Mouse
3. Trackball
4. Space ball
5. Joy stick
6. Light pen
7. Touch screen or Touch pannel
8. Data glove

9. Image scanner

1. **Keyboard:-** The most commonly used input device is keyboard the data is entered by pressing set of keys. All keys are labeled. A keyboard with 101 keys is called as qwerty keyboard.

The keyboard has alphabetic as well as numeric keys some special keys are available.

2. **Mouse:-** A mouse is small hand held box. Wheels are provided on bottom of mouse. Mouse is rotated on flat surface. Mouse can be picked and moved to other place without change the position of screen courser.

Mouse can have two button or three button. Buttons are provided at top of mouse. Mouse is attached with CPU using wire.

Advantage:-

1) It is simple to operate.
2) It is low cost device
3) It can select graphic object fastly.
4) It is used for quick positioning of curser on an item.

Disadvantage :- Small rotation of mouse can cause error in readings.

3. **Trackball :-** It also is a pointing device. It is similar to mouse except that you don't have to move the enter device like mouse rather only the ball is used for cursor movement. Ball is rolled with fingers. It requires less space for performing its operation. Sometimes it is fixed with mouse sometimes with keyboard.

Due to limitation of space in laptop it is not suitable as part of keyboard.

It can be rotated with palm also to produce curser movements on screen.

4. **Space Ball:-** It is similar to trackball but it can move in six direction whereas trackball can move in two directions only. It can be pushed and pulled in various directions.

5. **Joystick:-** It is a pointing device its working is same as that of trackball but instead of moving with hand ball is moving using stick ball is fixed socket. On socket stick is mounted stick can be moved in left right top down direction. The stick is also called as lever. The joystick can be mounted on keyboard. The stick is moved in any direction and amount of movement of cursor corresponds to amount of movement of stick. Joystick are less expensive.

Uses:- 1. It is used to play video games.

2. Joystick is used by flight stimulatory

3. It is used for controlling industrial robots.

6. **Light Pen:-** It also is a pointing device its shape is like pen or penal. It can detect light coming from points on CRT screen. Pen with not detect light emitted from background sources. When pen is on it is pointed on screen than bean will light up that spot it will generate pulse.

Disadvantage:-

1. It pen is used for longer period of time then it courses arm fatigue.
2. It gives false readings due to background light in room.

7. **Touch Screen or Touch Panel:-** It allows display of objects using a touch of finger. Touch panel will select any icon as option from set of icons displayed on screen.

Advantage:-

1. It is a simple method of selecting graphical object.
2. It is an easy way of input.

Application:- 1. These are used as information work for displaying.
information at hotel restaurants.
2. In public places like parks these are used to guide people by displaying information.

8. **Data Glove :-** It is a glove that you can wear in your hand. Glove can grasp virtual objects. Glove has a series of sensors. The seniors can detect movement of hand and fingers.

9. **Image Scanner:-** It is an input device the data or text is rewritten on paper. The paper is feeded to scanner. The paper written information is converted into electronic format. This format is stored in computer. The input documents can contain text, handwritten material picture etc.

By storing the document in computer, it becomes safe for longer period of time. The document will be permanently stored for future we can print the document when needed.

Output devices:- An output device generally is an electromechanical device which accepts data from a computer and translates then into a form understand able to users. It is as important as input device. It perfumer the reverse operation of that of in input unit.

An output unit performs following functions:-

1. It accepts the results produced by a computer, which are in coded form and we cannot easily understand them.
2. It converts these coded results to human readable form.
3. It supplies the converted results to outside world.

There are many types of output devices. Some commonly used output devices are as follows:-

1. Monitors or VDU (Video display unit)

2. Printers
3. Plotters
4. Speakers.

An output device can be one of the following tow types.

(a) Soft copy devices.

(b) Hard Copy devices.

Soft Copy device:- The output is produced on device not on paper. The output is temporary and erased when device is switched off. The output displayed on monitor is soft copy.

Hard Copy device:- It is output produced on paper. It can be touched. We can carry out paper to other place. It can be shown to other people also. It is not erasable. It can be stored permanently for future purposes. Output produced by platter and printer are example of these.

1. Monitors:- It is most popular device for producing soft copy output. It is also called as VDU (Visual display Unit). A monitor is attached with keyboard and CPU. The keyboard will be used to enter data. The CPU will process the data. The output will be displayed on monitor.

2. Printers:- A printer is an output device that produces text and graphics on paper. Printer is used to get the "Hard copy" of that documents. Printer is divided into two types.

(a) Impact Printers.

(b) Non Impact Printer.

(a) Impact Printers:- The printers in which there is a mechanical contact between printer head and paper for printing are called impact printers. These are noisy printers. These are similar to typewriter.

For example :- 1. Dot Matrix

2. Line Printers

1. Dot Matrix :- Dot matrix printer is an impact printer that produces text and graphics when tiny wire pins on the print head strike the ink ribbon.

Higher number of pins means that the printer prints more dots per character thus resetting in higher print quality.

Advantages:-

1. Low printing cost per page
2. Retable, colorable

Disadvantages :-

1. Noisy
2. Limited print quality
3. Low printing speed

4. Limited color printing.

2. Line Printers:- Line printers are impact printers used with most medium and large computer systems for producing high volume paper output. They are fast printers having speeds in the range of 300 to 2500 lines per minute.

(b) Non-Impact Printers:- The printers in which there is no mechanical contact between paper and printer are called non impact printers. These are not noisy.

For example:- 1. Inkjet Printers

2. Laser Printers.

1. Inkjet Printers:-

Inkjet printers are non impact printer which print text and images by spraying tiny droplets of liquid ink onto paper. They are most popular printers for home use. Inkjet printers produce high quality output.

Advantages:- 1. Low cost

2. Good for printing pictures
3. High quality of output
4. Easy to use
5. Reasonably fast

Disadvantages :- 1. Ink bleeding causing blurred effects one some paper

2. Ink is sensitive to water, even a small drop of water can course blurring.

2. Laser Printers: Laser Printers are non impact printers which can print text and images in high speed and high quality resolution. Laser printer are page printers. An entire page is processed at a time. They use laser beam to produce an image of the page.

Advantage :- 1. High Print speed.

2. Printout is not sensitive to water.
3. Good for high volume printing.

Disadvantages :- 1. More expensive than inkjet printers

2. Bulkier than inkjet printers.
3. Laser printers are less capable of print high quality images such as photos.

3. Plotters :- Plotters are output devices. They are used to produce good quality graphics and drawing under computers control. They use ink pen to draw graphics or drawings. Either single color or multicolor pens can be employed.

Pen plotters are slow devices. A pen plotter can take from several seconds (for simple drawings) to several minutes (for complex drawings) to produce a drawing. But it takes much less time as compared to traditional hand methods of producing drawing.

There are two types of plotters :-

1. Drum Plotter
2. Flat bed plotter

1. Drum Plotter:- In drum plotter, the paper on which the graph is to be drawn is mounted on a rotating drum.

The drum can rotate in either clockwise or anticlockwise direction under the control of the plotting instructions sent by the computers.

The pen can move left to right or right to left. The pen can also move up or down. The movement of the pen and drum are controlled by the graph plotting program.

2. Flat Bed Plotter:- A flat bed plotter has a surface on which paper is fixed.

The pen can be moved up or down. This type of plotter is called a flat bed plotter because it plots on paper which rests on a flat bed.

4. Speakers:- Computer speakers or multimedia speakers are speakers external to a computer that disables the lower fidelity built in speaker. A voice response system has an audio response device i.e. speaker which produces audio output obviously the output is temporary soft copy output. Banking industry uses speaker in ATM .

1.7 CLASSIFICATION OF COMPUTERS:-

Today computers are classified based on their made of use. According to this classification computers are classified as notebook computers personal computers workstations, mainframe systems super computers and client and saver computers.

1. Note book Computers (LAPTOPS) :-

Notebook computers are portable computers use by people who need computing resource wherever they go notebook computers can easily fit in a briefcase. Notebook computers are light in weight weighing around. 2 kg. They are also known as Laptop PCs (Laptop personal computers or simply Laptop) because they are as powerful as a moderate PC, and their size and weight allows them to be used comfortably.

We can use Laptop even at places where there is no eternal power source available (for example while travelling in a tram or airplane). Hence they are designed to operate with chargeable batteries with a fully battery a laptop can operate for a few hours.

2. Personal Computers (PCs) :- Micro computers a PC is a non portable general purpose computer that fits on a normal size office table and is used by one present at a time. Users use PCs for their personal computing needs either at their work places or at their homes. PCs have changed the work habits of organizations. An increasing proportion of office work now involves use of computers.

Those employees who could not work during traditional office hours due to personal reasons can now work part of their time in office and remainder at home by having a PC at their homes. Several individuals also keep a PC at their homes to run business firm homes. Children use PCs for education and entertainment.

Hence, PCs are now very common everywhere, and can be found in offices classrooms, homes, hospitals, shops, clinics etc. It is also known as microcomputers.

3. Workstations:-

A workstation is a powerful desktop computer designed to meet computing needs of engineers architects and other professionals who need greater processing power large storage and better graphics display facility than normal PCs provide for example workstations are used commonly for complex scientific and engineering problems. A workstation is almost similar to high end PC, and is used typically by one person at a time.

4. Mainframe Computers:-

Mainframe computers are computer systems that are mainly used for handling data processing needs of large size organizations. There are several large size organizations such as banks hospital, railways etc, that need on line processing of large number of transactions.

Mainframe computers are very large and fast computers. They are used in centralized location where many terminals (input/output devices) are connected with one CPU and thus allow different users to share the single CPU. They have a very high memory and can support thousands of were.

Mainframe systems are much bigger and several time more expensive than workstations.

5. Super Computer:-

Super computers are the most powerful and expensive computers available at any given time. They are mainly designed for complex scientific applications that require enormous processing power.

Super computers have many CPUs which operate in parallel to make it as a fastest computer.

It is mainly used for following applications:-

1. Weather information
2. Defence
3. Medicine etc .

6. Client and Server Computers:-

With increased popularity of computer networks, it has become possible to interconnect several computers that can communicate with each other over the network.

1.8 Operating System (OS)

A set of programs that control how the system works. It is the most important program that runs on a computers (Program and data)

All computers must have an operating system used for starting the computer and to run other programs. It provides an interface between a user of a computer and the computer hard work.

Operating system perform basic tasks such as recognizing input from keyboard sending output to the display screen, keeping track of files and controlling peripheral devices such as printers.

The operating system is also responsible for security ensuring that unauthorized users do not access the system. It is like a traffic cop it makes sure that different program and users running at the same time do not interfere each other.

1.9 Functions of Operating System

The following are the main functions performed by an operating system:-

1. It works as an interface between hardware and software.
2. Memory management allocation of main memory and other storage areas to the system program as well as user program.
3. Input/Output management assignment of the different Input/output device while they are being executed.
4. Processor management assignment of processor to different tasks being performed by the computer system
5. File management creation of a new file copying moving a file from one storage location to another.
6. Priority system It determines and maintains the order in which jobs are to be executed in the computer system.
7. Data Security and Data Integrity unauthorized users do not access the system.

1.10 Window Operating System

Window is an operating system with a graphical user interface. We can open more than one window at a time.

Key Points:

- Windows support networking.
- 2. We can set the wallpaper Multiuser OS
- 3. We can set the time dire city.
- 3. Windows is Multitasking.
- 4. We can set the dire city.
- 4. Windows has a GUI (Graphical user interface) which means you can use a, mouse, new pictures, icons etc.
- 5. We can change the time zone
- 5. Windows is easy to learn and understand.
- 6. We can set the screen saver
- 6. Windows is more preferable operating system.
- 7. We can enjoy playing games notching movies and listening songs.
- 8. Windows operating system is user friendly
- 9. Windows performs operation sleekly
- 10. It can detect and installs new hardware automatically.

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SEMESTER II

Course: Computer Applications in Accounting

UNIT 2: MS Word, MS PowerPoint and MS Excel

2.1 Word Processing

2.2 Word processing concepts

2.3 Use of Templates

2.4 Working with Word Document

- **2.4.1 Editing text**
- **2.4.2 Find and replace text**
- **2.4.3 Formatting**
- **2.4.4 Spell check**
- **2.4.5 Autocorrect**
- **2.4.6 Auto text**
- **2.4.7 Bullets and numbering**
- **2.4.8 Tabs**

2.5 Introduction to Presentation

2.6 Structure of the Presentation

2.7 Working with Presentation

2.8 Creating a New Presentation

2.9 Adding, Copying and Deleting Slides

2.10 Introduction of Spreadsheet

2.11 Spreadsheet and its Business Applications

2.12 Managing worksheets

2.13 Formatting

2.14 Entering data

2.15 Editing a worksheet

2.16 Printing a worksheet

2.1 Word Processing

Word processing was one of the first applications developed for computers and is one of the most used applications for personal and office productivity. Originally it was an application developed for the production of print material as a replacement for the typewriter. The advantages of using a word processor over the typewriter is that mistakes can be corrected easily and documents can be saved for future use and edited as needed.

Development of the Word Processor

The term "word processing" was coined by IBM in the late 1960s and was used to describe the "combination of people, processes and equipment used to transform ideas into printed communication" (New York Times, September 12, 1972). Soon after the term was understood to mean a typewriter with automatic features for editing and correcting documents electronically, making it possible to produce a perfect original document.

Originally word processors had no screens and saved copies of documents on magnetic tape for retyping, corrections or printout. Later models could display one line of text on a small screen, making it easier to edit documents. The labour and cost savings of word processing technology were immediate. Documents no longer had to be retyped to fix simple errors and could be saved, stored, reused and worked on later.

The next generation of word processors consisted of dedicated machines with CRT monitors capable of displaying many lines of text at once.

These word processing appliances were produced by large companies such as IBM and sold for as much as US $10,000. Hand in hand with the development of word processing technology was the development of new technologies for storing and printing documents, such as the floppy disk and daisy wheel printer.

In the early 1980s the development of word processing software and the pricing of personal computers was the beginning of the end for word processing devices. Personal computers had the advantage because they came with other software, such as spreadsheets and eventually the graphical user interface to make working with documents easier.

2.2 Word processing concepts

Modern word processors

Word processors have evolved into multifunctional publishing applications. Some of the tasks modern word processing applications are capable of are:

- Preparing batch mailings by combining a form letter template with a database file containing individual information
- Creating keyword indexes
- Creating tables of contents with page numbers

- Creating footnotes
- Grammar checking, spell checking and thesaurus functions
- Creating custom headers and footers for documents

Design considerations for word processed documents

At its most basic level a word processed document is a means to convey your message. Incorporating the fundamentals of good design in your documents makes it easier for the reader to understand that message. Even a well-written document that is not laid out well can be hard to read, resulting in your message being lost.

Effective documents are organised so that information is presented in easily digestible pieces, important information is emphasised and ideas are presented logically. Here are some guidelines:

• Write effective paragraphs

An effective paragraph organises a sentence or group of sentences around a single main idea. There is no ideal paragraph length although a paragraph that is overly long can be harder to read thus hiding your message. Make sure your paragraphs have one main idea and split paragraphs if necessary.

• Write effective sentences

Just as with paragraphs, a reader understands of your message depends on logically organised sentences. Good sentences are clear, coherent and have good "flow".

• Use headings and subheadings

Headings and subheadings serve as guideposts for your reader. They help to organise material into smaller sections within a common theme, breaking up your document into digestible pieces.

• Use bulleted or numbered lists

Lists help organise parallel ideas or ideas that need to be presented in a sequence. For a list to be effective, it should:

- form a logical group
- use parallel structure
- use words, phrases or short sentences
- use numbers to imply a hierarchy or order, either for a list of items in priority sequence or a set of step-by-step procedures
- Use white space to separate and emphasize points

White space is the space in your document that has no text or graphics. White space is a good way to separate points or sections in your document and makes your document easier to read.

• Use graphics and illustrations effectively

Graphics are also a good way to make your document seem less text-heavy but they should only be used when they have a direct relationship with the message of your document. Graphics should be placed close

to the text they refer to, in a way that doesn't obstruct the flow of the reader. Graphics should be of good quality, clear and have descriptive captions.

• Emphasize headings

Use larger type, a different typeface, surrounding white space or bold type for headings to draw the reader's attention.

• Use a different typeface for contrast

Capitalize words used as headings for emphasis. Use italics or bolding for phrases or single words for emphasis.

• Choose the right font

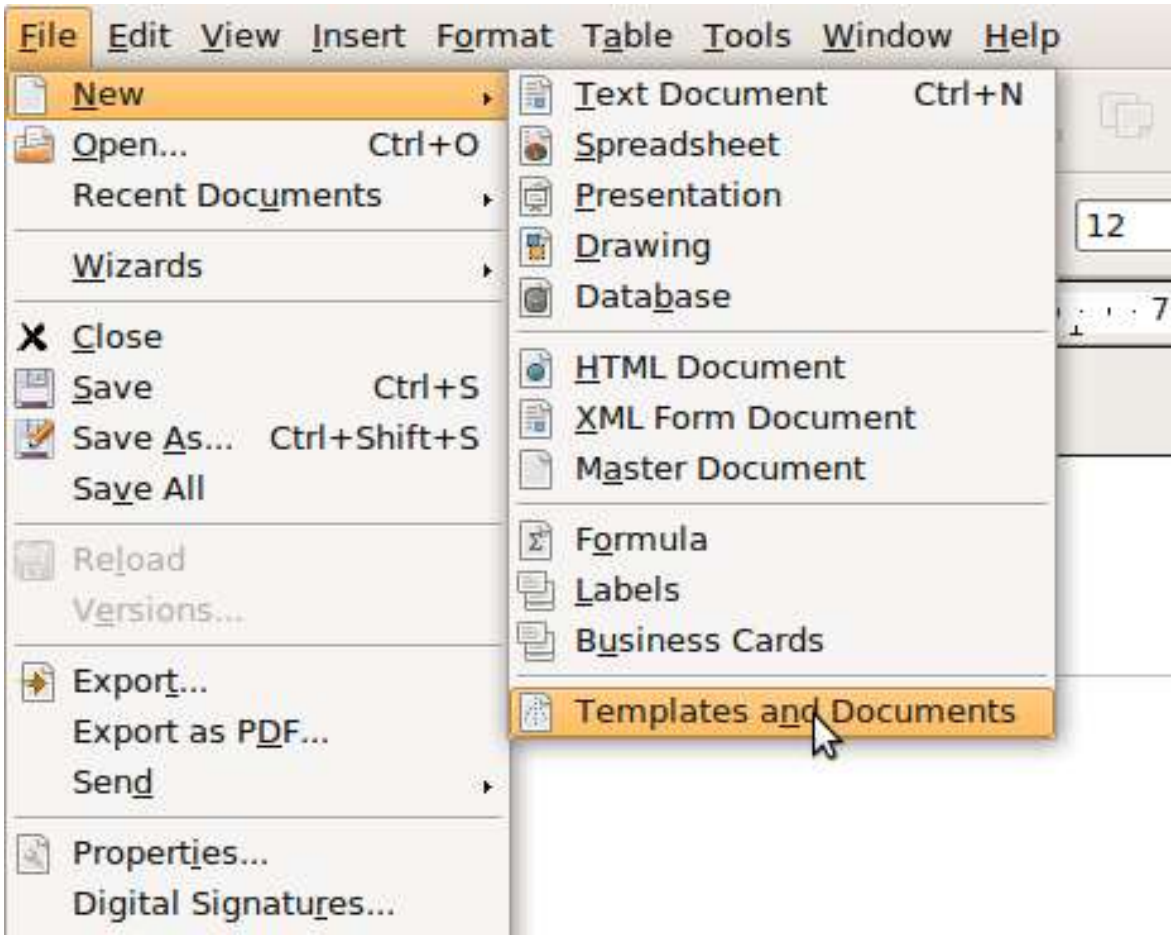
Fonts can create a visual impression that acts upon your reader. Use at least a font size of 10. Limit the number of different fonts you use in a document. Colour, highlighting and other decorative elements should be used sparingly and only for emphasis when needed. Serif fonts have ornamental strokes at the ends of letters and work well for bold type and for printed copies. Sans serif fonts are simpler and are easier to read on a computer screen.

2.3 Use of Templates

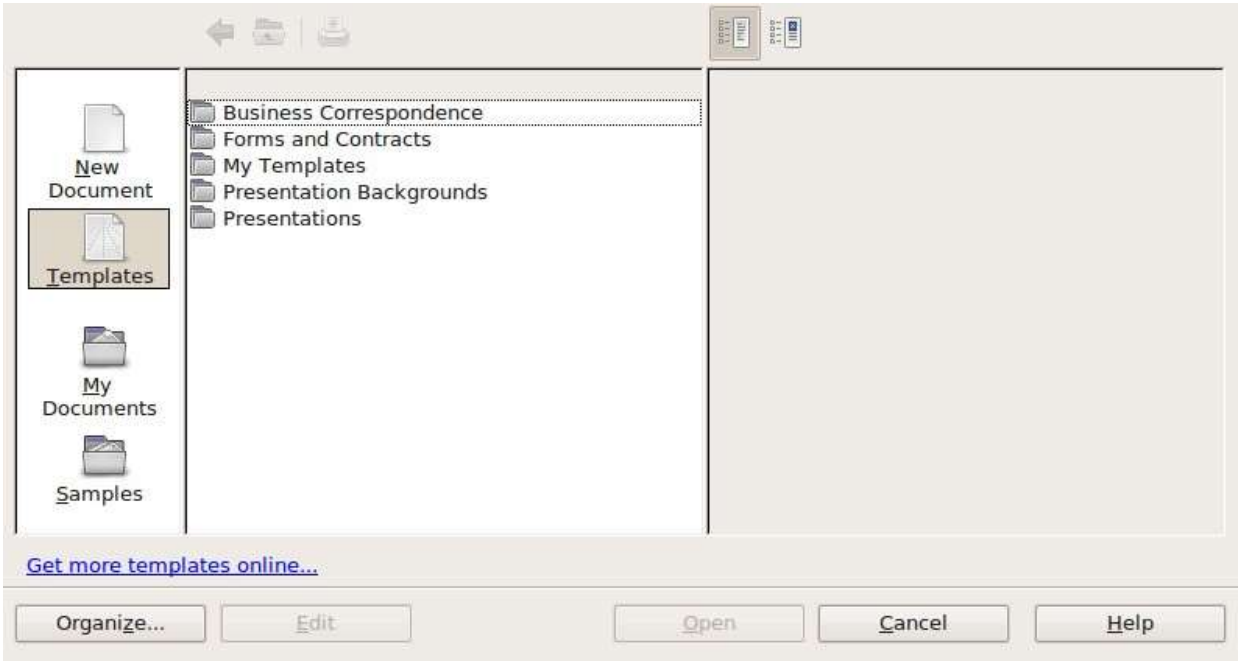
A template is a document with a design that can be used by other documents. Templates are very useful if you are working with a group of documents that should all look the same.

For example, a manager may have a set of templates for letters, memos, faxes and reports. An accounting clerk may have templates for invoices and account statements. Each template would be designed differently and any document created from a template would start out having the same design as the template.

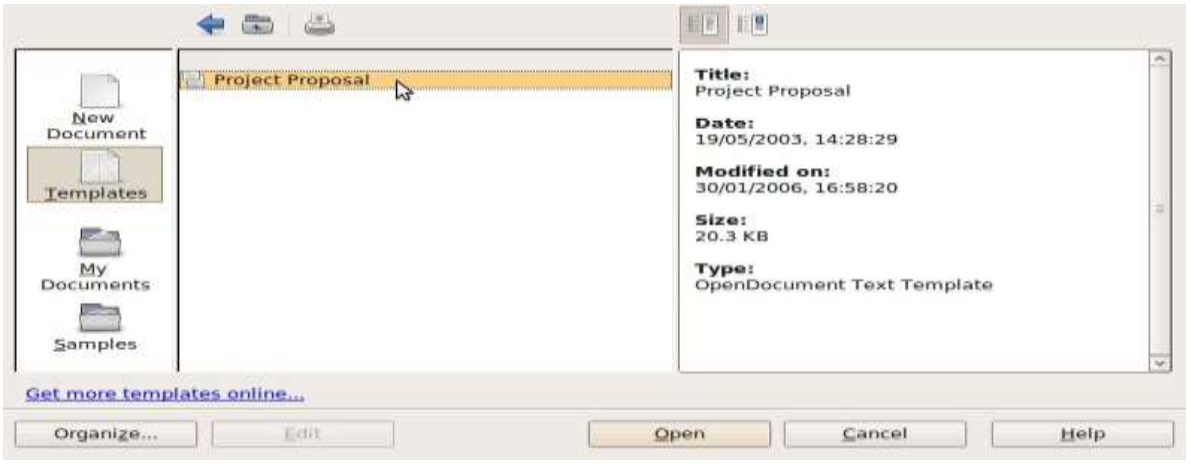
1. Click on **File** on the menu Bar
2. Click on **New** on the drop down menu
3. Click on **Templates and Documents**



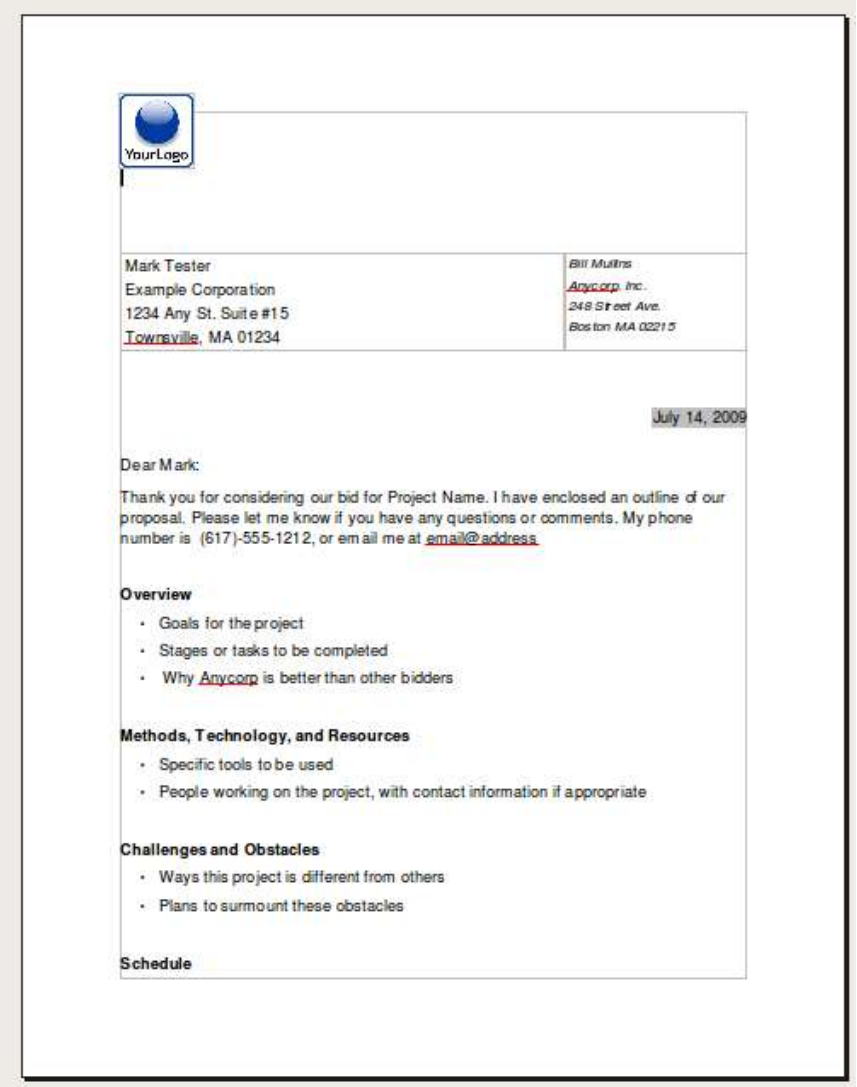
This will open the **Template dialogue window**.



Double-click on the **Business Correspondence** link to see the templates in that category.



4. Select the **Project Proposal** template and click on the **Open** Button to open it. The document that opens looks like this:



As you can see the document already has much of the formatting done for you, making it easy for you to create a new project proposal document based on this template.

You can also create and save your own templates in Open Office Writer. We will discuss this more in a later section.

2.4 Working with Word Document

2.4.1 Editing text

Once you have typed your text into Microsoft Word, you will probably want to edit and format your document to make it more appealing. The best thing about Word is that it highlights any errors that you have made, whether it is a typo, a misspelling, or a grammar error. Some errors will be automatically corrected as you type. For instance, if you type the word 'example', Word will correct it for you automatically.

Follow these steps to add, replace, and format text in Word.

Add text

To enter text, in most cases just begin typing. As you type, the insertion point moves and your text automatically continues on the next line.

- Place the cursor where you want to add the text.
- Start typing.

Moving or copying text

You can move text, or a copy of it, to another location. When you use the Cut or Copy command in the Edit menu, the selected text is placed in a holding area called the Clipboard, where the text remains until you choose Cut or Copy again or you turn off your computer. The Clipboard holds the contents of only one

Cut or Copy at a time

To remove text from one location and move it to another:

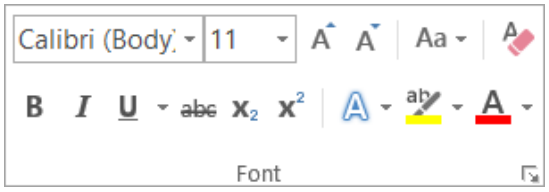
- Select the text and choose Cut from the Edit menu.
- Click with the I-beam pointer where you want to move the text and choose Paste from the Edit menu.

Replace text

- Select the text you want to replace.
- To select a single word, double-click it.
- To select a line, click to the left of it.
- Start typing.

Format text

- Select the text you want to format.
- Select an option to change the font, font size, font colour, or make the text bold, italics, or underline.



Delete text

To remove text without placing a copy on the Clipboard:

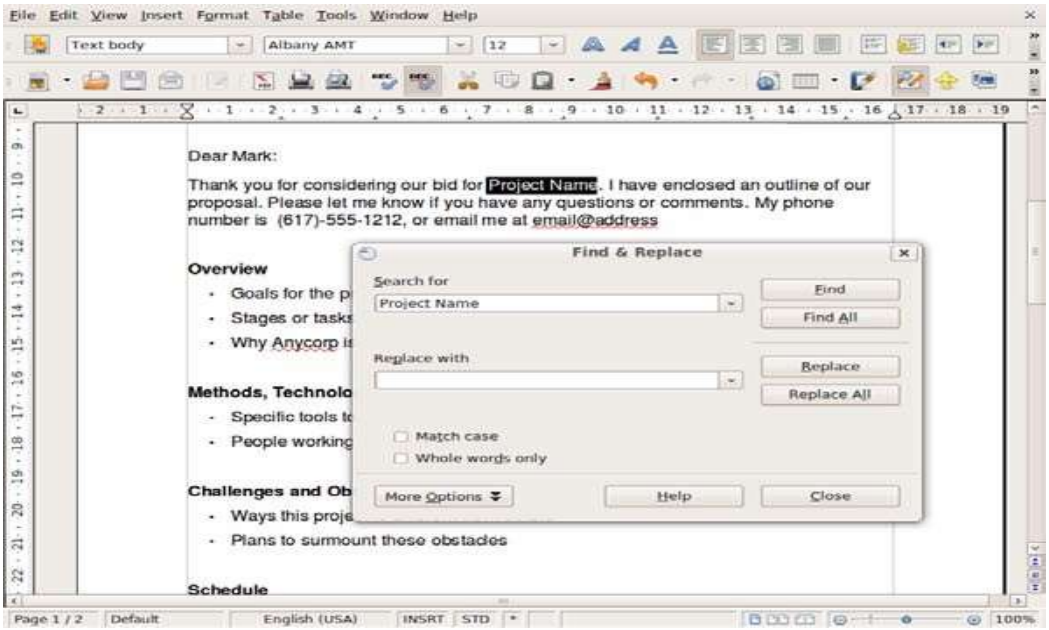
- Select the text and choose clear from the Edit menu or press the Delete key.

2.4.2 Find and replace text

The **Find and Replace tool** allows you to search for words or phrases— or, for that matter, for any combination of characters in a document—and replace them with the text you want

Searching for text

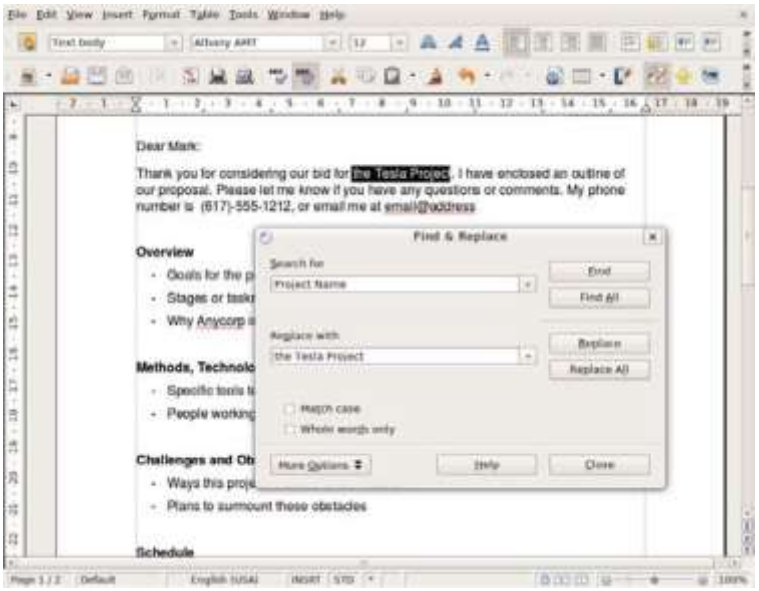
1. From the **Edit menu**, click on **Find and Replace**
2. In the **Search for** input box, type in the text you would like to search for.



3. Click on the **Find button** to find the first instance of your search text.
4. Clicking again on the **Find button** will search through the document to find further instances of your search text.

Replacing text

1. From the Edit menu, click on **Find and Replace.**
2. In the **Search for** input box, type in the text you would like to search for.
3. In the **Replace with** input box, type in the text you would like to replace the search text with.



4. You can either replace instances of the search text all at once or one at a time. To replace one at a time:
    a. Click on the **Find button** to find the first instance of your search text.
    b. Click on **Replace** to replace that instance.
    c. Continue until you have finished making replacements.
5. To replace all instances:
    a. Click on **Replace All** button.
6. Click **Close** to return to your document when you are finished replacing text.

2.4.3 Formatting

Text Formatting

The following exercises will guide you through applying formatting to text, but also apply to formatting paragraphs. It's important to note that formatting should be used to enhance the readability of your document, according to the guidelines discussed earlier in this module. Overusing formatting can detract from your document's readability.

Fonts and font sizes

Your choice of fonts should set the tone for a design, provide the best readability and convey the right image. There are certain established guidelines and best practices for selecting fonts for the best results, but these are not hard and fast rules:

- Don't use more than 3 or 4 fonts in your document.
- Avoid mixing two very similar fonts.
- Serif faces are the norm for most books and newspapers, making them familiar and comfortable to readers and a good choice for many printed documents.
- Sans serif fonts are a good choice for documents that are read from a computer screen. Sans serif fonts are generally more readable when the font size is small (e.g. for footnotes or captions).
- For most documents, a font size of between 10 point and 12 point is appropriate.

To choose a font and font size:

1. Highlight the text that you want the font applied to.
2. From the formatting toolbar, click on the down arrow next to the **font box** and choose a font from the list.
3. From the formatting toolbar, click on the down arrow next to the **font size box** and choose a font size from the list.

Bold, italics and underlining

You can use **bold**, *italics* and underline to place emphasis where needed in your document. Bold face is often used to draw attention to a block of text by **making it stand out** from the surrounding text. Bold face is also often used for headings.

Italic face can also be used for emphasis, but its impact is more subtle than bold face. Italic face is often used for titles (e.g. book titles, movie titles), the proper names of ships or trains (e.g. the Orient Express) or for foreign words or phrases within text. Be careful not to create long blocks of text with italic face, since it is more difficult to read.

Underlining text can also be used to emphasize parts of your document. However, since underlining is used to denote a web link in HTML, its use should be limited.

To apply bold, italics or underline:

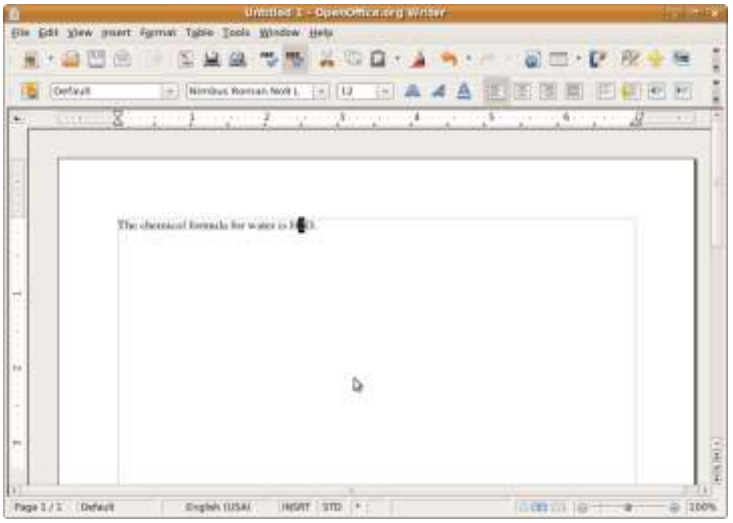
- Highlight the text that you want the font face applied to.
- From the **formatting toolbar**, click on the icon for **bold**, **italics** or **underline**.

Superscript and Subscript

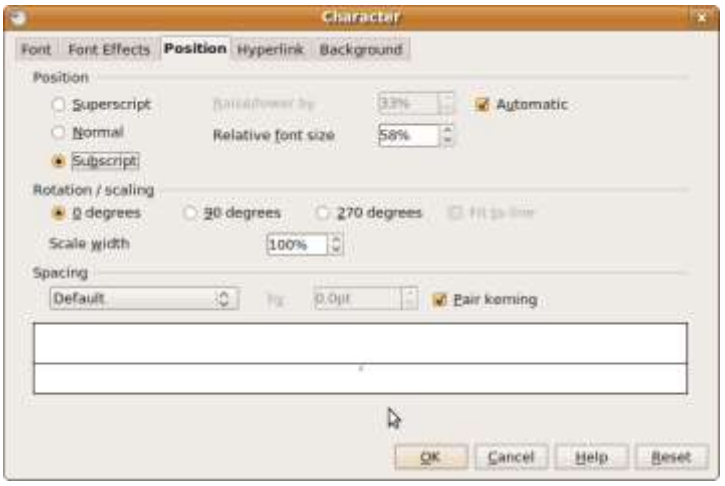
Superscript is when text is raised above the baseline and is often used to indicate a footnote, to represent an exponent in mathematics (e.g. $5^2 = 25$) or to indicate an ordinal number (e.g. 25^{th}). Subscript is when text is dropped below the baseline and is typically used in chemical formulas (e.g. H_2O).

To apply superscript or subscript commands:

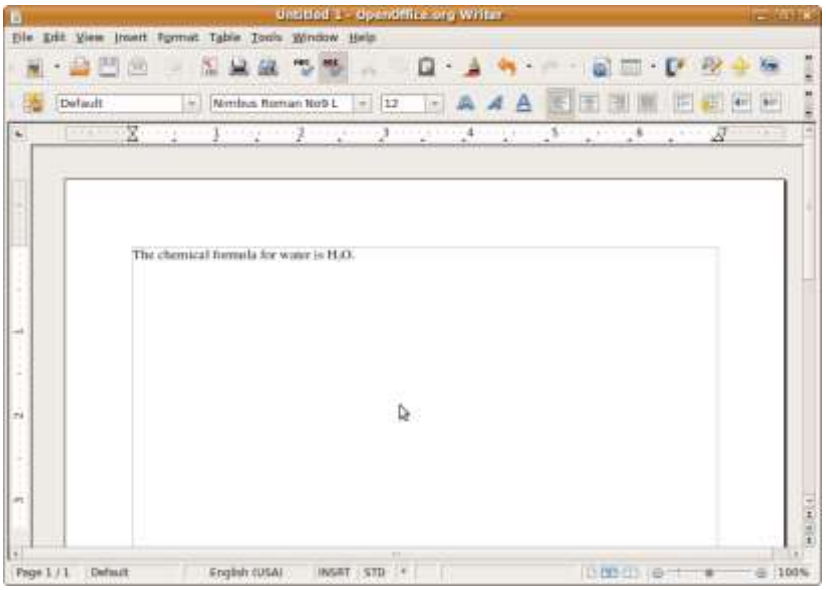
- Highlight the text that you want the style applied to.



1. Choose Format->Character from the Writer menu.
2. Click on the Position tab.



3. Choose superscript or subscript from the dialogue window. You can also choose how much to raise or lower the text by or what size to make the text.
4. Click OK when you are finished.

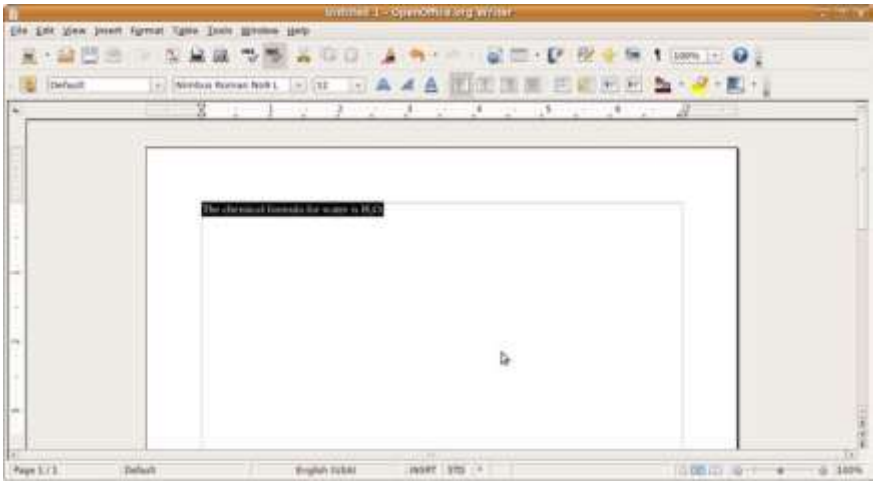


Text decoration

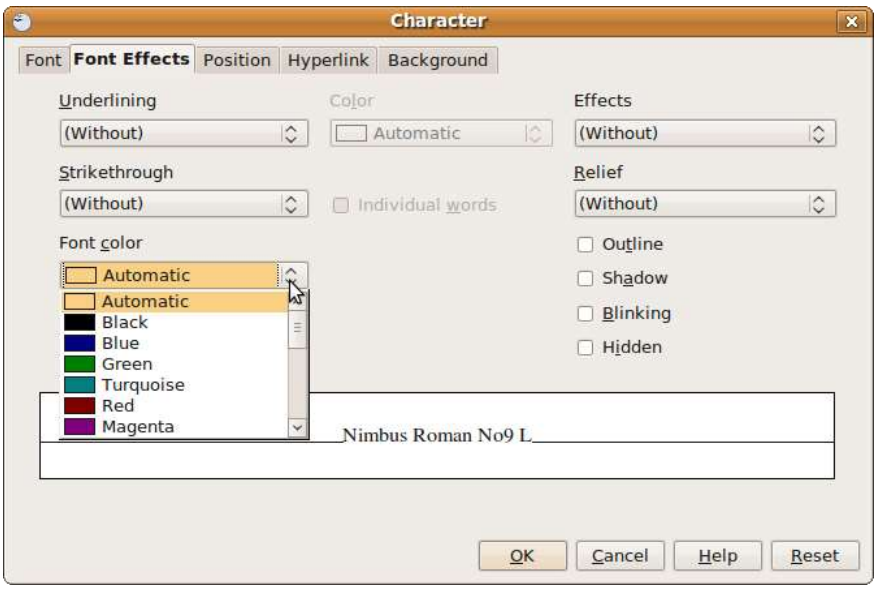
Text decoration includes such things as text color, highlighting and line- through. Text decoration, like bold and italics, can be used to emphasize text in a document, but should be used sparingly because it can be distracting.

To apply text decoration:

1. Highlight the text that you want the font applied to.



2. From the formatting toolbar, click on the icon for the text decoration you want to use.
3. Choose Format->Character from the Writer menu.
4. Click on the Font Effects tab.
5. Choose the font effect you want to apply: underlining, strikethrough, font colour or other effects.



6. Click on the OK button to save your changes.

Automatic hyphenation

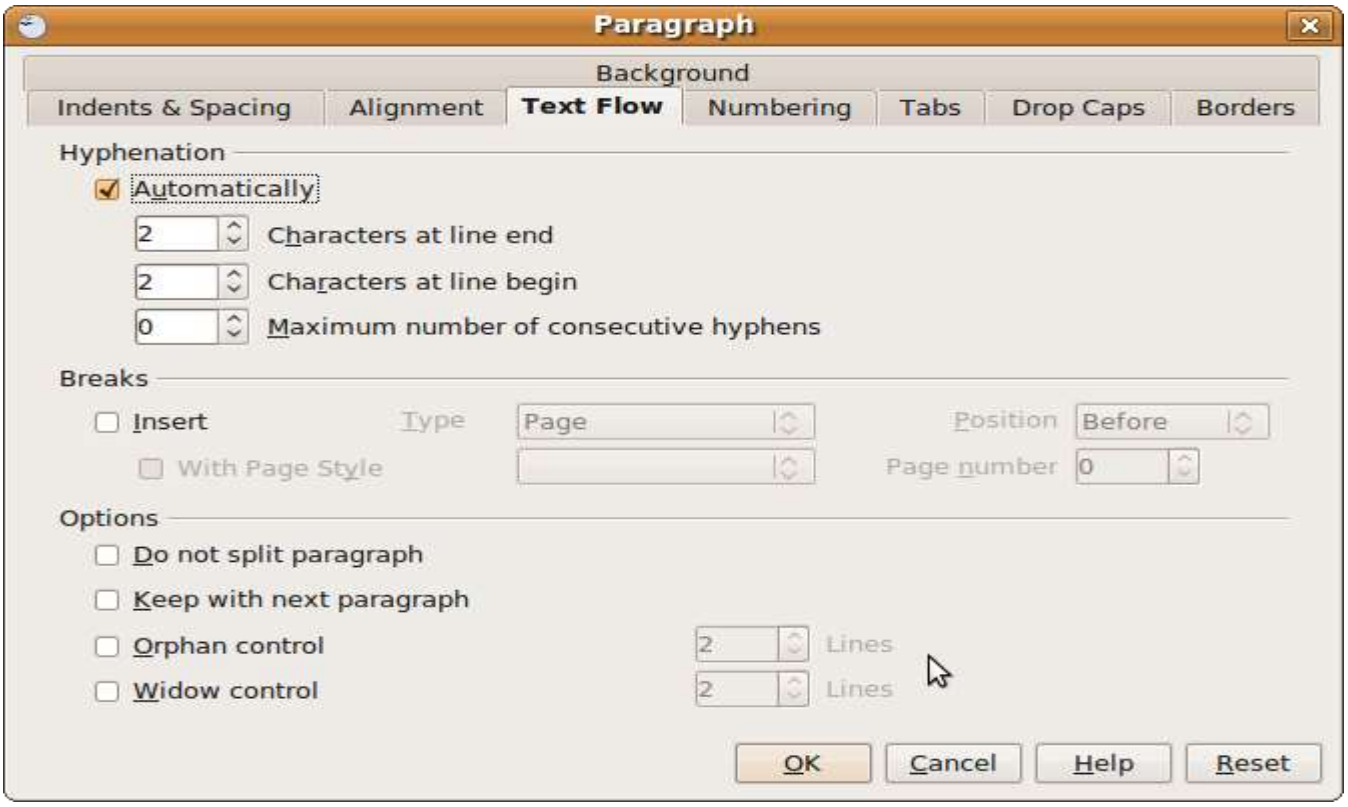
Automatic hyphenation can be used to automatically break words at the end of a line of text so that part of the word wraps to the next line of text. This has the effect of making your lines of text more even in length.

In practice, it is usually better to not use automatic hyphenation. You will typically get better results by looking at your document after you have

typed it and creating manual hyphenations where needed. One reason for this is natural variations in line length enhance the readability of your document by making a distinction between one line and the next. If a line of text is extraordinarily short, you can use hyphenation on the first word of the next line to ease this.

To turn automatic hyphenation on:

1. Choose Format->Paragraph from the Writer menu.
2. Click on the Text Flow tab.
3. Click on the checkbox to set hyphenation automatically.



Paragraph Formatting

As discussed earlier, an effective paragraph organizes a sentence or group of sentences around a single main idea. There is no ideal paragraph length, although a paragraph that is overly long can be harder to read.

Too many one-sentence paragraphs in a document is also distracting. Please sue one-sentence paragraphs only when really necessary – to emphasize a specific point.

Make sure your paragraphs have one main idea. If there is more than one main idea, split the

paragraph up.

Creating and merging paragraph

When you create a new document in Open Office Writer, you are automatically places at the beginning of your first paragraph. Type the sentences you want for your paragraph and when you are finished, press the Enter or Return key on your keyboard to end the paragraph and begin a new one

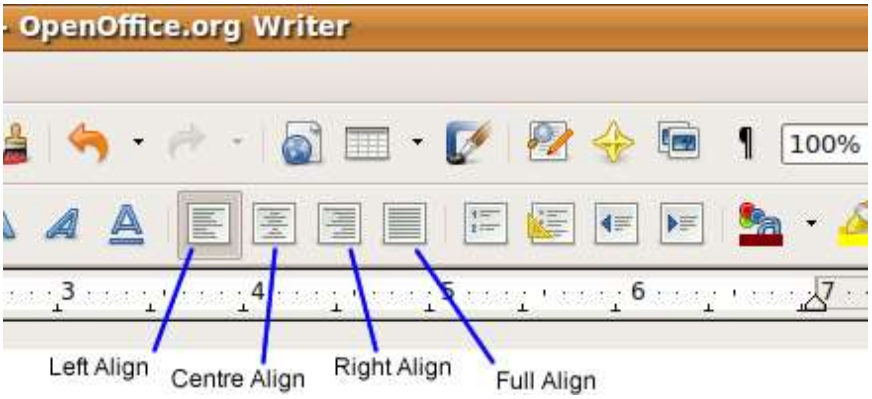
Any formatting that you applied to your first paragraph is automatically carried over to the next paragraph.

Two paragraphs can be merged by placing your cursor at the beginning of the second paragraph and pressing the **Backspace key** or placing your cursor at the end of the first paragraph and pressing the **Delete key**.

Text alignment

There are four forms of alignment for text in your document:

1. **Left alignment:** Text is aligned so as to be even along the left side of a paragraph. The lines are uneven along the right side of the paragraph.
2. **Right alignment:** Text is aligned so as to be even along the right side of a paragraph. The lines are uneven along the left side of the paragraph.
3. **Centre alignment:** Text is aligned so as to be centered in the document. The lines are uneven along both the left and right side of the paragraph.
4. **Full alignment:** Text is aligned so as to be even along both the left and right sides of a paragraph. This is accomplished by adjusting the spacing between words where necessary.



Generally you should use left alignment in your documents because it enhances readability. Use the other forms of alignment for special effect when necessary.

To set the alignment of your documents:

1. Select the paragraph you want to apply the alignment to.

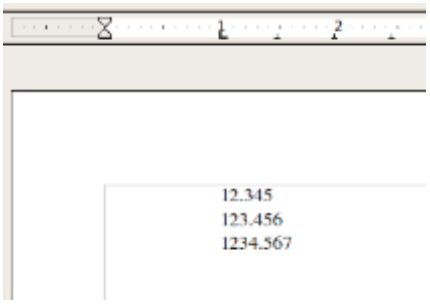
2. On the formatting toolbar, click on the button for the alignment you want applied.

Using tabs

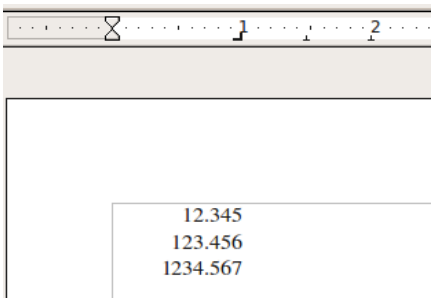
Tabs are used to position text horizontally within a document. By default, tab stops are placed every half inch if your measurements are set in inches or every 1.25 centimeters if your measurements are set in metric units.

There are 4 types of tabs you can set in Writer:

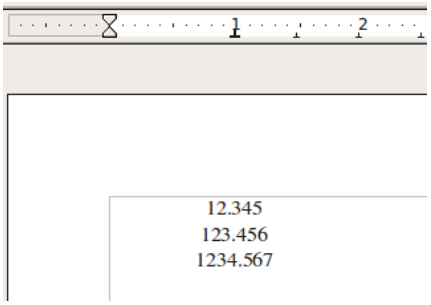
- **Left tab:** the text starts at the tab position.



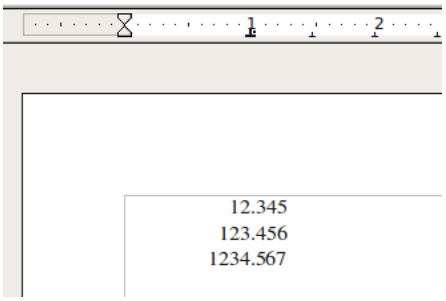
- **Right tab:** the text stops at the tab position.



- **Centre tab:** the text is centred at the tab position.



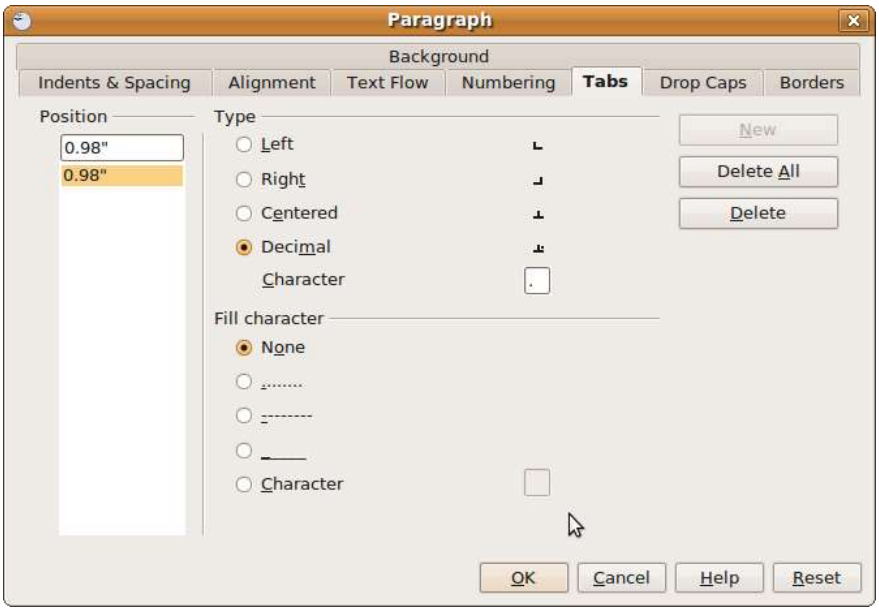
- **Decimal tab:** used for positioning a series of numbers. The decimal points line up over the tab position.



There are two steps to using tabs:

1. Setting tab positions (or tab stops).
2. Placing text at the tab positions from within the document.
3. Setting tab positions

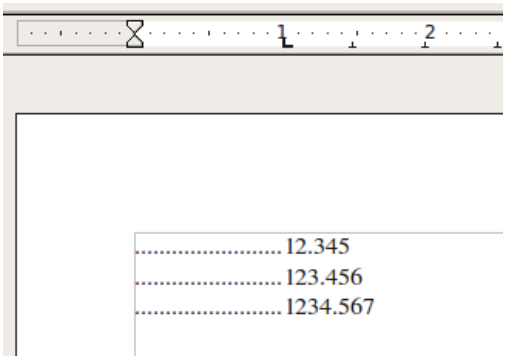
Tab positions can be set on the ruler or using the tab format options. To set a tab on the ruler, simply click on the ruler at the position you want the tab. You can reposition the tab by clicking and dragging it to the left or right. By default, tabs that you set this way are Left tabs. You can change the tab type by double-clicking on the tab and setting the tab type from the dialogue box.



To set tabs using the tab format options:

1. Place your cursor at the point in the text you wish to position with a tab.
2. Choose **Format->Paragraph** from the Writer menu

3. Click on the **Tabs tab**.
4. Choose the position you want the tab, the type of tab and the fill or leader you want.



Placing text at the tab position

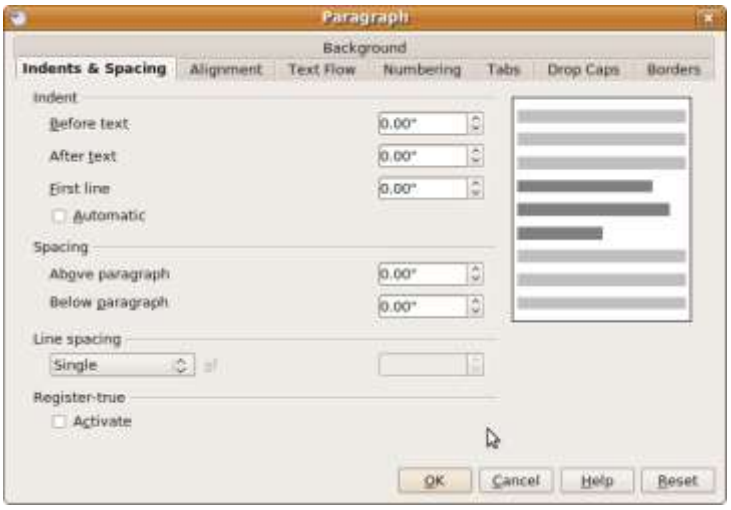
Once you have your tabs set, you can position your text by placing your cursor at the start of the text you want to position and then pressing on the Tab key on your keyboard.

Paragraph spacing

Paragraph spacing can be used to make your paragraphs more readable and visually presentable by making paragraphs stand out from each other. You can set spacing between paragraphs or on each side of a paragraph (indentation).

Spacing between paragraphs and indentation should be done using the paragraph formatting options rather than typing an extra paragraph marker by pressing the return key twice. This way you can control the paragraph spacing throughout your entire document.

1. Select the paragraphs you want to space or indent.
2. Select **Format->Paragraph** from the Writer menu.
3. Click on the **Indents & Spacing** tab.



4. Set the amount of left and right indentation. You can also set additional indentation for the first line of paragraphs.
5. Set the amount of spacing above and below each paragraph.
6. Click the **OK** button when you are finished.

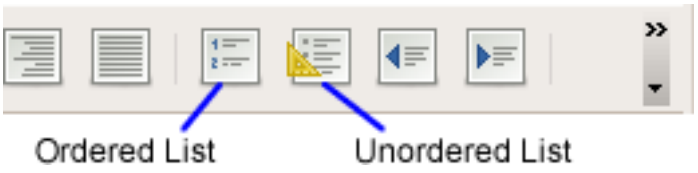
Working with Lists

Lists enhance the readability of your document by organizing parallel ideas or ideas that need to be presented in a sequence. Lists should form logical groups and should be written using parallel structure.

Unordered lists

Unordered lists are used to organize ideas when the order of the ideas is not important to their presentation. Each list element in an unordered list is started with a bullet. To create an unordered list:

1. Type your list elements, creating a new paragraph with each element.
2. Select all of the list elements.
3. On the formatting toolbar click on the **unordered list icon**.



Shopping list:

- bread
- eggs
- chicken
- potatoes
- carrots
- apples
- oranges

Ordered lists

Ordered lists are used when the order of the list elements are important, such as a set of instructions or a list of priorities. Each list element in an ordered list is started with a number of letter. To create an ordered list:

1. Type your list elements, creating a new paragraph with each element.
2. Select all of the list elements.
3. On the formatting toolbar click on the **ordered list icon**.

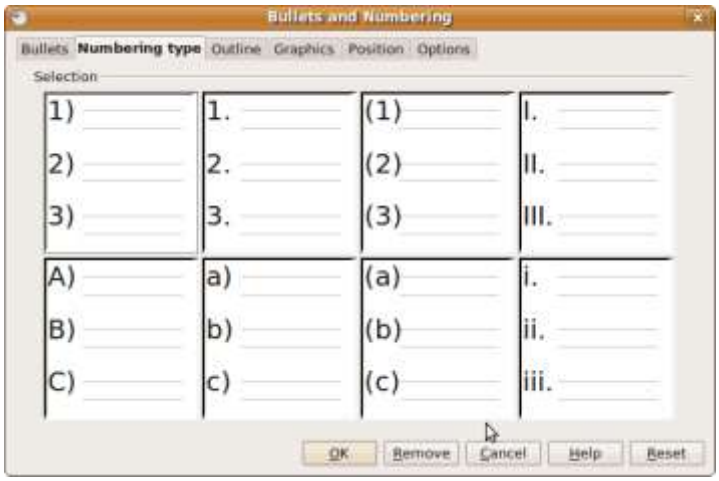
Setting up and starting your computer:

1. Connect the monitor, mouse, and keyboard to your computer.
2. Connect the power cord to your computer and plug it into a power outlet.
3. Press the power button on the front of your computer.
4. When prompted, type your user name.
5. When prompted, type your password.

Modifying list format

You can modify your lists by changing the list type (ordered or unordered), changing the bullet style for unordered lists or changing the number or letter style for ordered lists. To change the list format:

1. Select the list elements you want to change.
2. To change the list type, click on the appropriate button from the format toolbar.
3. To change list style options, click on **Format->Bullets and Numbering** from the Writer menu.
4. Choose the type of numbering or bullets you want to use for your list.



From the **Bullets and Numbering dialogue** you can also format your list to create outlines or use graphics as bullets. As with other elements of word processed documents, keeping the style simple is usually preferable.

Paragraph borders and shading

Borders and shading can also make a paragraph stand out from the other paragraphs and content in a document. A border is a rectangular area surrounding a paragraph. Shading refers to the color or image behind a paragraph or block of text.

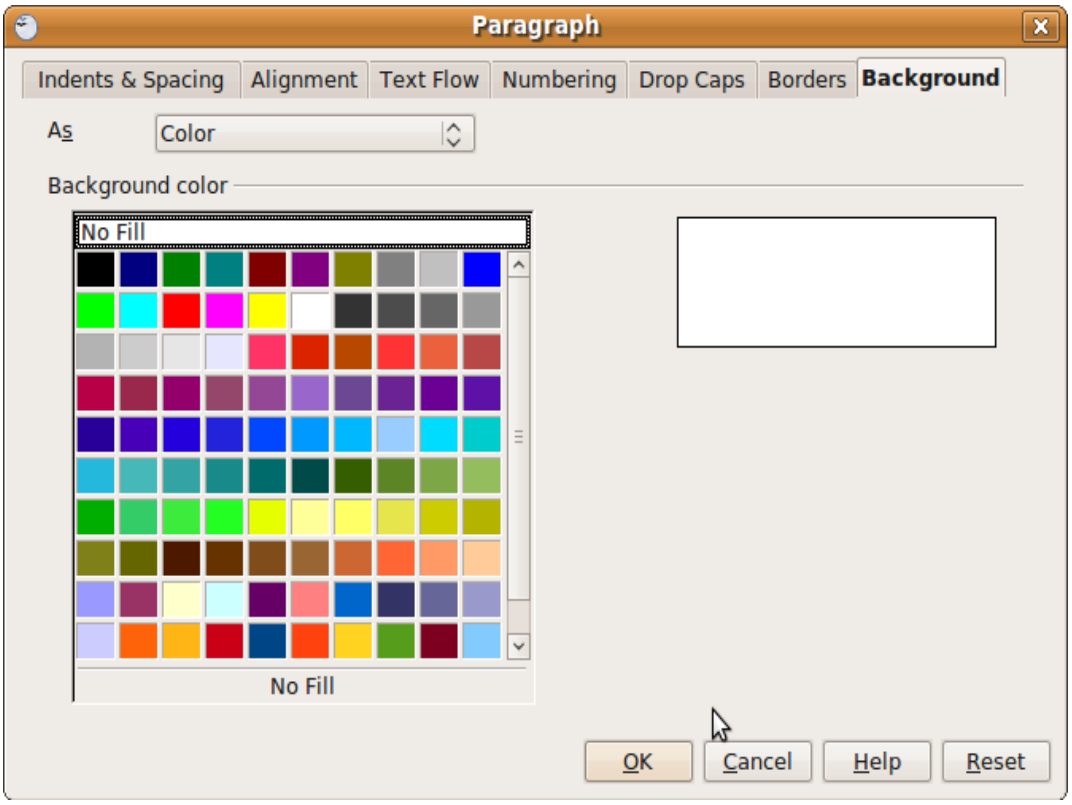
Setting borders

You can choose to display and set features of borders:

1. Select the paragraph you would like the formatting applied to.
2. Choose Paragraph->Borders from the Writer menu.
3. From the Borders dialogue, choose the border features you want, such as line arrangement, border colour and thickness, spacing and shadow.

Setting shading

1. Choose Paragraph->Shading from the Writer menu.
2. Click on the Background tab.



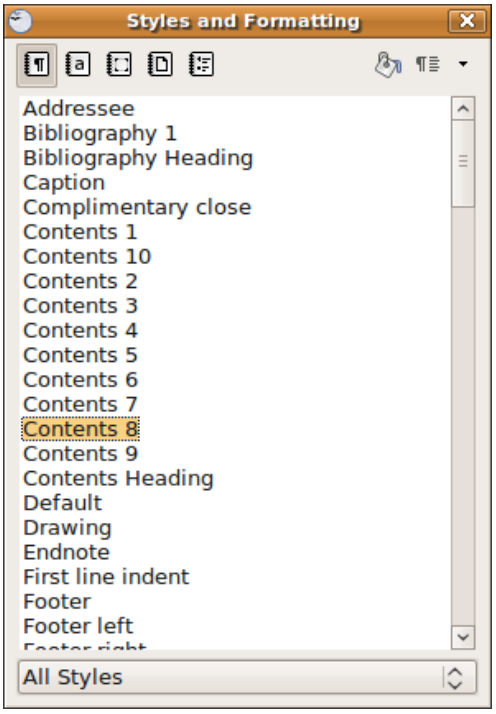
3. Set the backgrou**nd color or image from the dialogue window.**

Creating and Applying Styles

Styles allow you to save formatting options for the content in your document and to easily apply this formatting to other content in the document. Writer has many pre-defined styles built in to the program. You can use these styles as they are, edit them or create new styles

To apply a style:

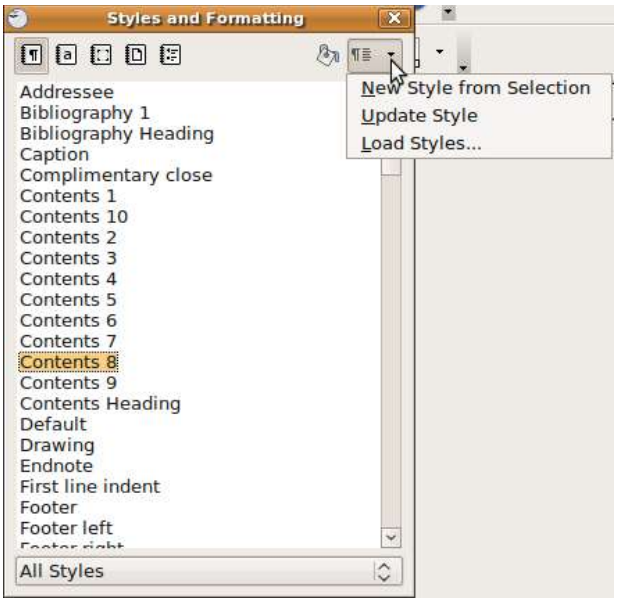
1. Select (highlight) the content you want to apply the style to.
2. Choose **Format->Styles and Formatting** from the Writer menu.



3. Apply the style you want to use by double-clicking on the style. You can choose styles for paragraphs, characters, frames, pages or lists by clicking on the icons at the top of the style dialogue.

You may want to create a new style specifically for your document. To create a new style:

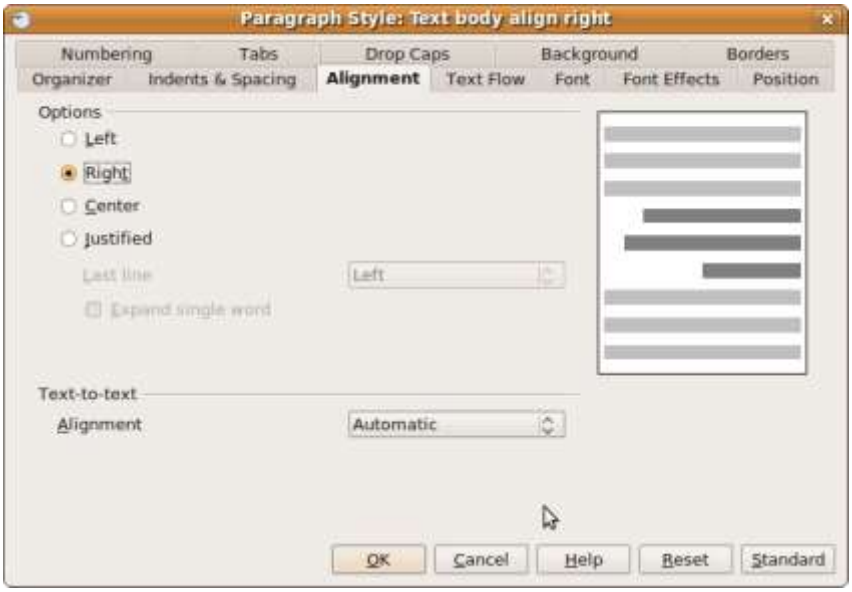
1. Choose **Format->Styles and Formatting** from the Writer menu.
2. Choose a style from the list to base your new style on.
3. Click on the **New Style from Selection** button and choose **New Style from Selection**.



4. Type a name for your new style and click OK. You now have created a new style.

To modify a style:

1. Right-click on the style and choose **Modify** from the context menu.
2. From the style window that opens, select the features you would like in your new style.



2.4.4 Spell check

It offers the ability to check the spelling of the words in your document. Although this is a great tool, it shouldn't replace careful spelling and proofreading. Just because a word is spelled correctly doesn't mean that it is used correctly, as in this sentence:

Also, some words may appear as incorrect in your document, when they are indeed correct. For example, the British spelling of “colour” appears as incorrect in may spell check programs. Thankfully, writer also gives you the ability to add to its internal dictionary.

Grammar check is a useful tool to pick up grammatical errors, but like spell check, it's not a replacement for careful editing and proofreading.

You can perform a spell check on your document at any time, but Writer monitors your spelling for you as you are typing and indicates a misspelled word with a wavy line underneath.

To spell check your document:

1. Choose **Tools->Spelling and Grammar** from the Writer menu.
2. The spell check program will scan your document for errors and when it finds one it will offer suggestions to correct the error.

3. You can then choose to ignore the suggestion, add the word to the dictionary or correct the spelling based on the suggestions.

2.4.5 Autocorrect

AutoCorrect is a software feature commonly found in word processing programs, such as Microsoft Word. As the name implies, this feature automatically corrects misspellings and common typos in a document.

The AutoCorrect feature automatically corrects common typographical errors when you make them.

Step 1 − Click the **File tab**, click **Options**, and then click the **Proofing** option available in the left most column, it will display the **Word Options** dialog box.

Step 2 − Click the **AutoCorrect Options** button which will display the **AutoCorrect** dialog box and then click the **AutoCorrect** tab. Now you have to make sure all the options are enabled, especially the **Replace Text as you type** option. It is also recommended to be careful when you turn off an option.

Step 4 − Click **OK** to close the **AutoCorrect** Options dialog box and again click **OK** to close the **Word Options** dialog box. Now try to type **Marketing** and as soon as you type this word, Microsoft Word autocorrects it with the correct word **Marketing** word.

2.4.6 Auto text

AutoText is a common type of building block that stores text and graphics. You can use the **Building Blocks** Organizer to find or edit a building block.

To use predefined AutoText, select the **Insert** tab. In the **Text** group, select **Quick Parts** > **AutoText**. Choose a predefined AutoText entry.

2.4.7 Bullets and Numbering

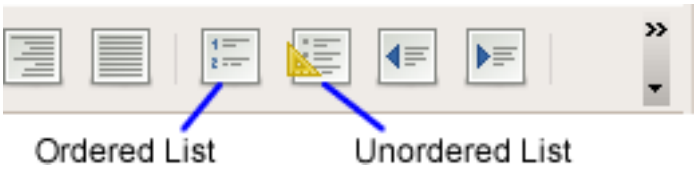
Lists enhance the readability of your document by organizing parallel ideas or ideas that need

to be presented in a sequence. Lists should form logical groups and should be written using parallel structure.

Unordered lists

Unordered lists are used to organize ideas when the order of the ideas is not important to their presentation. Each list element in an unordered list is started with a bullet. To create an unordered list:

- Type your list elements, creating a new paragraph with each element.
- Select all of the list elements.
- On the formatting toolbar click on the **unordered list icon**.



Shopping list:

- bread
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Ordered lists

Ordered lists are used when the order of the list elements are important, such as a set of instructions or a list of priorities. Each list element in an ordered list is started with a number of letter. To create an ordered list:

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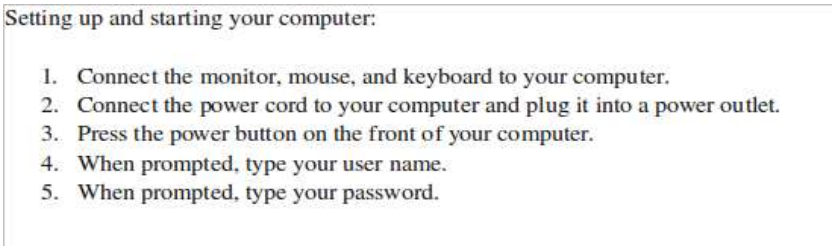
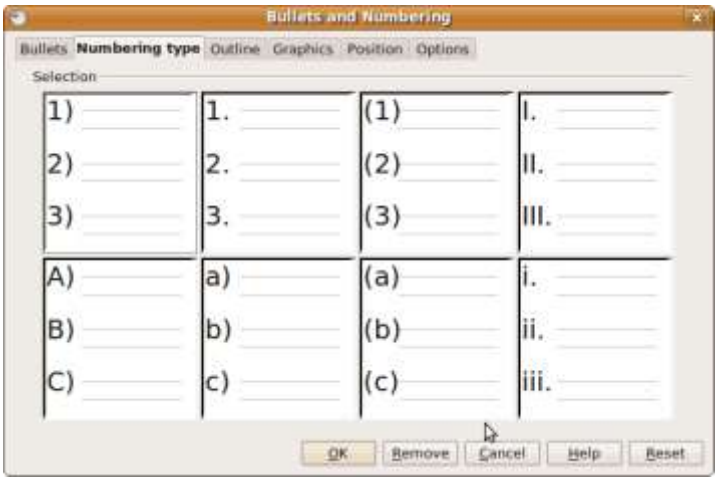
- Select all of the list elements.
- On the formatting toolbar click on the **ordered list icon**.



Modifying list format

You can modify your lists by changing the list type (ordered or unordered), changing the bullet style for unordered lists or changing the number or letter style for ordered lists. To change the list format:

- Select the list elements you want to change.
- To change the list type, click on the appropriate button from the format toolbar.
- To change list style options, click on **Format->Bullets and Numbering** from the Writer menu.
- Choose the type of numbering or bullets you want to use for your list.



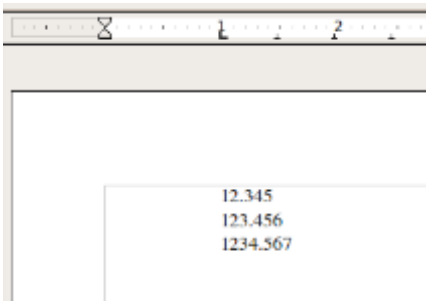
From the **Bullets and Numbering dialogue** you can also format your list to create outlines or use graphics as bullets. As with other elements of word processed documents, keeping the style simple is usually preferable.

2.4.8 Tabs

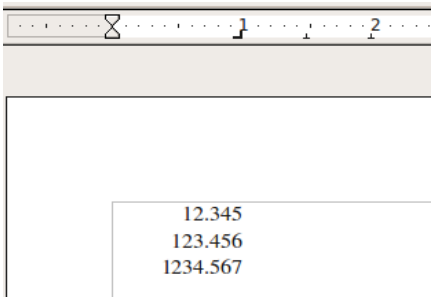
Tabs are used to position text horizontally within a document. By default, tab stops are placed every half inch if your measurements are set in inches or every 1.25 centimeters if your measurements are set in metric units.

There are 4 types of tabs you can set in Writer:

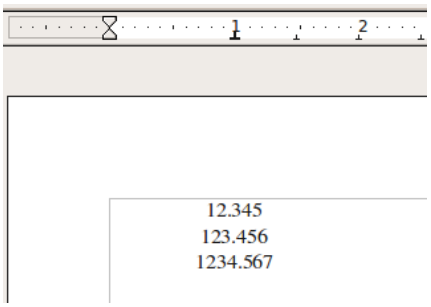
- **Left tab:** the text starts at the tab position.



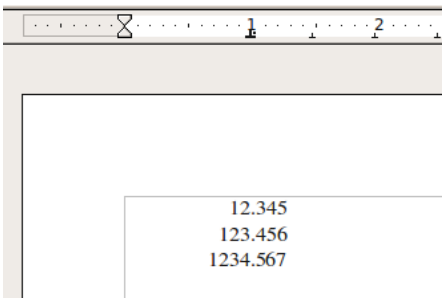
- **Right tab:** the text stops at the tab position.



- **Centre tab:** the text is centred at the tab position.



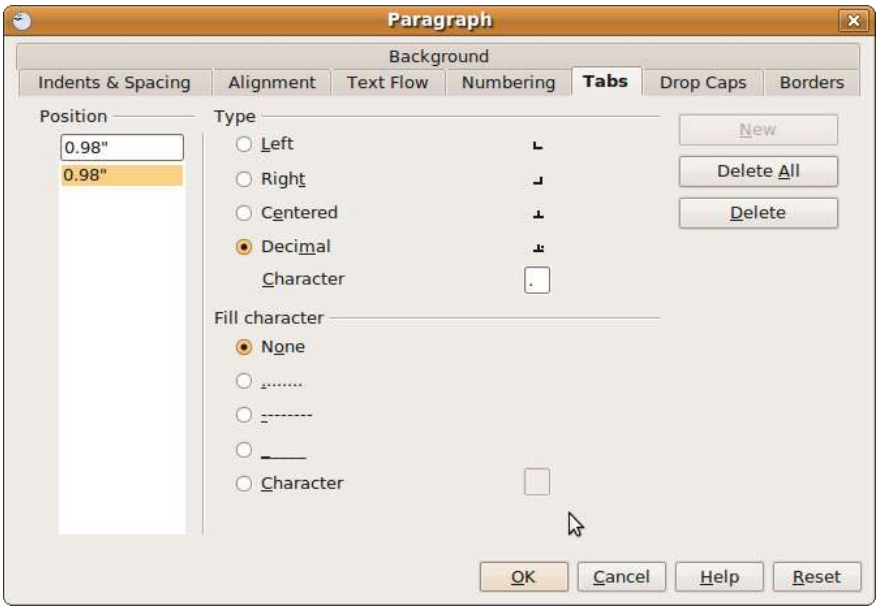
- **Decimal tab:** used for positioning a series of numbers. The decimal points line up over the tab position.



There are two steps to using tabs:

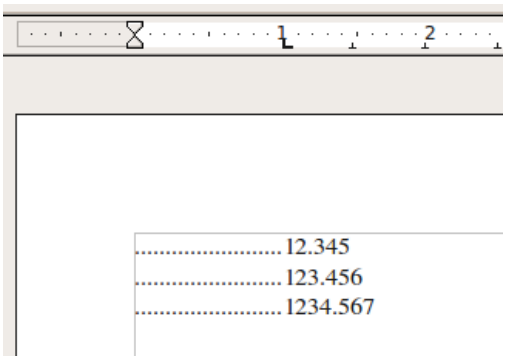
- Setting tab positions (or tab stops).
- Placing text at the tab positions from within the document.
- Setting tab positions

Tab positions can be set on the ruler or using the tab format options. To set a tab on the ruler, simply click on the ruler at the position you want the tab. You can reposition the tab by clicking and dragging it to the left or right. By default, tabs that you set this way are Left tabs. You can change the tab type by double-clicking on the tab and setting the tab type from the dialogue box.



To set tabs using the tab format options:

5. Place your cursor at the point in the text you wish to position with a tab.
6. Choose **Format->Paragraph** from the Writer menu
7. Click on the **Tabs tab**.
8. Choose the position you want the tab, the type of tab and the fill or leader you want.



Placing text at the tab position

Once you have your tabs set, you can position your text by placing your cursor at the start of the text you want to position and then pressing on the Tab key on your keyboard.

2.5 Introduction to Presentation

What is a good presentation?

The main purpose of creating a presentation is to:

- show a message in key points
- enhance the message with multimedia, i.e. text, graphics, animations and sound

A presentation has the advantages of:

- increasing the understanding of a message and reducingconfusion
- increasing audience involvement
- drawing the audience attention to key points
- making a presentation more interesting
- guiding the presenter through a presentation, assist him/her to keep to the time allocated for a presentation and giving him/her afeeling of confidence and control

The disadvantages of using a presentation are:

- too many or using the wrong animations
- sound, colour and graphics create confusion and pull the attention away from the main message
- multimedia entertains without enhancing the message
- the presenter focuses on the screen, reads long parts from thescreen and loses contact with the audience
- it gives too much information
- **Design principles**

Depending on the purpose and audience of the presentation, there are afew considerations in the design of presentations:

- All slides should be well designed to fit the specific purpose and audience
- using excessive animations is distracting; unless it fits the purpose avoid them
- Do not use sounds in the transition of slides, unless you want to create a specific effect. Avoid sound effects in formal presentations.

- graphical images explain more than words alone; use them whenyou can
- where there are generally accepted abbreviations and acronyms use them to minimise text usage
- Ensure that your choices of colours are legible from a distance. Light fonts on dark backgrounds are good for textual material, but scientific graphs often work better on a light background. Keep the background colour simple.
- Use the right type-faces and fonts, emphasising with bold-face or different colours. It is advisable though to keep the colours on your screen to a maximum of four.
- Use descriptive headings. Don't let your audience guess or experience difficulties in deciphering the meaning or purpose of a slide. Use of descriptive headings not only asserts the reader withthe slide, but also leads to fewer slides.
- use short, concise phrases
- Make use of bullet points. Golden rule is no more than five bullets per slide, then it becomes too much.
- Make use of numbered lists. The same rule for bullets applies for numbers – less is more. Do not use more than five numbers per slide.

The Design Process

To create and convey a successful presentation you need to:

- plan carefully:
    - What do you want the audience to know once you have finished the presentation?
    - What do you want the audience to believe once you have finished the presentation?
- do your research
- know your audience
- time your presentation
- practice your presentation
- speak comfortably and clearly

Purpose of the Presentation

Presentations are an effective way to communicate or sell an idea to a large crowd of people at the same time. However, it is not just about communicating information or selling ideas. Determining the purpose ofyour presentation involves finding answers to the following questions among others:

- Why do you want to make a presentation?
- What do you want to communicate?
- What do you aim at achieving with the communication?
- Do you really need to use a presentation to achieve this?

2.6 Structure of the Presentation

A hierarchical structure organizes information from more-general to more specific dimensions, so that information at the top of the hierarchy is more general than information at the bottom. And it is advisable to usesuch a structure when creating your presentations.

A hierarchical structure is used:

1. to comprehend information – the more marked the hierarchical structure, the easier it is for us to understand
2. to commit information to memory and later retrieve it
3. to decide about the importance of information – we assume information at the top of the hierarchy is more important than lower information, so we pay more attention to it and learn it better

Also remember to add an introduction and conclusion to your presentation. The introduction is key to an effective presentation.

Introductions should have the following components:

- background and motivation
- objective (of the briefing or the research in general)
- an overview or outline of the rest of the briefing

The conclusion at the end will give an overview of findings, recommendations and implications. Typically in the conclusion will be a way forward. The conclusion can be more than one slide.

Type Style

There are significant differences in the choice of typefaces between printed information and a presentation. While a serif typeface like Garamond might look presentable on paper, on a presentation it can be difficult to read. Sans serif fonts generally look better on computer displays and presentations than serif fonts (serifs are the little hooks onthe ends of letters).

Serif (Garamond 36 point)	Sans Serif (Verdana 28 point)

Also depending on the audience and the purpose of the presentation, some fonts might be more suitable than others. For example, for formal or official presentations, Arial would be suitable while Comic Sans mightbe suitable for a very informal presentation.

Type Size

Depending on the audience and the presentation room, some font sizes might be more legible than others. It is always important to consider theroom where the presentation will take place when choosing the size. In large rooms, with the audience seated a distance from the projection screen, large font sizes will be better than small ones.

Upper or Lower Case

Although upper case letters might be good to emphasize a point, their useshould be sparing or avoided. Upper case letters occupy more space on the slide and are slow to read. For some audiences, the use of all upper case characters might be perceived as "SCREAMING".

Formatting Types (bold, italics, underline)

Bold face makes letters more readable and appears clearer whenprojected on a screen.

Italics are slow to read especially from a distance and should be avoidedor used sparingly.

Underlining is not very effective in a presentation and must be avoided. Use other means such as size, color, bold to emphasize your main points.

Colour Considerations

Colour can have a great impact on the effectiveness of a presentation, andso colour choice deserves some thought. Improper use of colour can affect readability, recognition, retention and communication. Some colours are perceived to have meanings in different cultures and thereforetheir use should be in accordance to those cultures. Colour has also been used to evoke moods or states of mind. Some people also believe that colour enhances their learning.

While it is important to choose a colour theme that is line with yourorganization's colours, it is important to consider these other issues:

- colour contrast
- background effects
- colour blind people

Colour Contrast

Highly contrasting colours improve the readability of the slides. Care, however, should be taken not to use very sharp colours as they are tiringto the eyes.

Background Effects

Bright backgrounds can also be tiring to the eyes when a presentation is displayed using an overhead projector, since the bright light used by theseprojectors is reflected back to the audience.

Graphics and illustrations

It is important to include visual elements to break the monotony and to illustrate important points. Graphics and illustrations are visual representations of the discussion and can greatly improve understandingand retention. Charts and graphs can help illustrate technical data or trends, and can be easily incorporated into your presentations.

Consider the following when using graphics or illustrations:

- choose images that help support the content rather than justdecorate the page
- use text to augment the graphic, not dominate it
- Graphics should be easily viewable and not too complex. For complex illustrations, show the illustration in its entirety, then zoom in to see the key features, or simplify the graphic by cuttingout nonessential elements
- charts and graphs are excellent ways to display numerical information or trend data (for example, changes over time)

- limit graphics to one or two per page
- Try to avoid using too much movement in transition of graphs andcharts. When using photos or drawings, animation might be effective
- Avoid using sound effects unless it is effective and needed.

Most Common Mistakes in Presentations

Avoid these common mistakes:

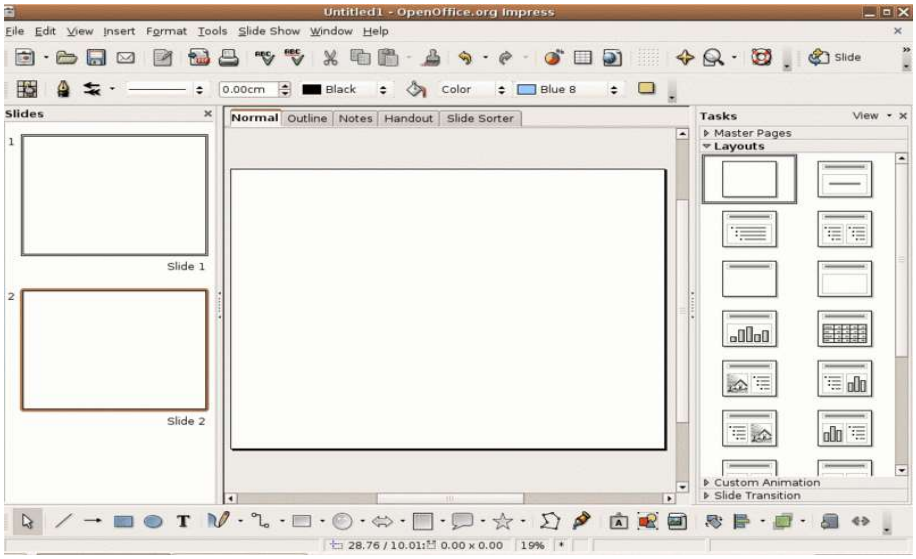
- Illegible content – Slides that contain information that is not easilyreadable force the audience to try and guess what is written. Audiences tend to lose interest in the presentation if they cannot see what is being presented.
- Poor organisation – Slides that are poorly organised make it difficult for your audience to understand the message of your presentation. Information that is poorly ordered is disruptive for thepresenter and intimidating for the audience.
- Information overload on a slide – Too many details on a slide is intimidating and detracts from comprehension and retention of theinformation in the slide.
- Typographical and spelling errors – "typos" and spelling errors undermine your audience's confidence in you and detract from themessage of your presentation.
- Irrelevant colour, sounds, graphics and animation. Avoid what iscalled "bells and whistles".

2.7 Working with Presentation

Impress Window Layout

When you launch Impress, a new, blank document, or default window, opens. Shown below is the OpenOffice Impress default window.

It shows the three main working areas of the Impress window, viz. Slidespane, Workspace and Task pane as well as different ribbons and toolbarsacross the window.



Here is a brief explanation of the Impress window.

Title Bar

The title bar is the upper most band on your Open Office Impress window.

The Title bar displays both the name of the presentation and the name ofthe application.

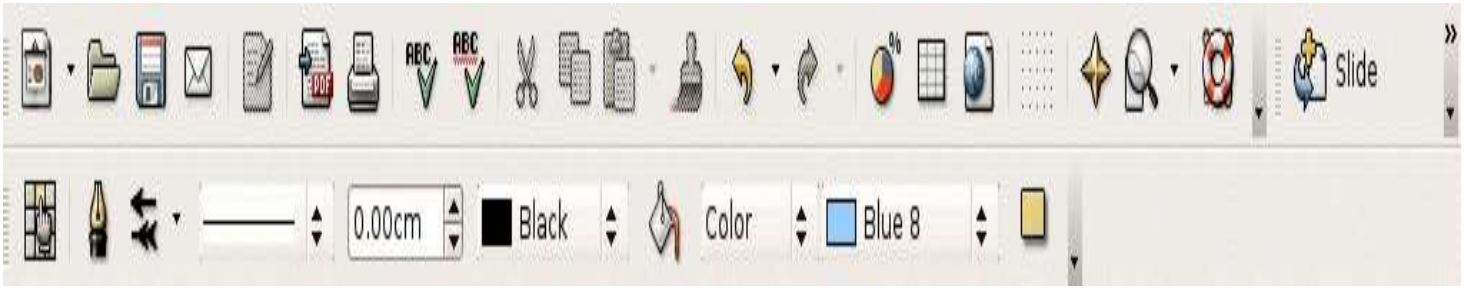
- The name of the presentation is Proposal to Funders.odp (hence the“Proposal to Funders” in the title).
- The name of the application is Open Office Impress (hence thename OpenOffice.org Impress).

Menu bar

The Menu bar is made of text menus displayed below. The Menu bar displays all the tools that are available in Impress. Each button displays atext menu (dropdown menu) when clicking on it.

Other Toolbars

A Toolbar contains commands that have pictures or icons associated withthem. These pictures may also appear as shortcuts in the Menu Bar:



Changing toolbars

There are several toolbars built into Impress. These are:

You can:

- display toolbars by ticking them off on the dropdown menu
- hide toolbars by un-ticking them on the dropdown menu

- move toolbars around by grabbing the toolbar handle on the leftside of the toolbar and dragging it. You can dock them somewhere else or leave them floating in the Workspace.
-  close toolbars by dragging them into the workspace and press theon the toolbar

Task Pane

The Task pane, which by default appears on the right hand side of Open Office Impress, provides you with cascading menu options for:

- Master Pages (choice of 28 slide masters)
- Layouts (choice of 20 layouts)
- Table Design (choice of 11 standard tables)
- Custom Animations (a variety are listed and can be changed orremoved later)
- Slide Transitions (56 transitions are available, you can change thespeed or to do it manually/automatically and timing of automatic transition)

Any one of the menu options can be maximized by clicking on the .The menu with the displays the full menu.

To close the task pane, click on the or unstick on **View Task Pane.** Torestore the task pane, tick Task pane on **View Task Pane.**

Slides Pane

The Slides pane contains thumbnail pictures of the slides in your presentation; in the order they will be shown. Clicking on a slide in theSlides pane selects it and places it in the Workspace. While it is there, you can apply any changes desired to that particular slide.

Several operations can be performed on one or more slides in the Slidespane:

- add new slides at any place within the presentation after the firstslide
- mark a slide as hidden so that it will not be shown as part of theslide show
- delete a slide from the presentation if it is no longer needed
- move slides around

To close the slides pane click on the or untick on **View Slide Pane.**

To restore the task pane, tick Task pane on **View Slide Pane.**

Page View Buttons

The Workspace has five tabs: **Normal, Outline, Notes, Handout, andSlide Sorter**. These five tabs are called Page View Buttons. You can access these by clicking on the tab in the Workspace or by choosing **View** and the appropriate view.

Each button reveals a view that is designed to make completing certaintasks easier. In summary:

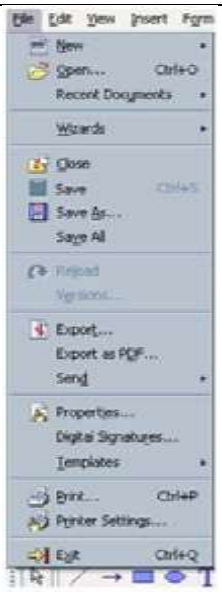
- **Normal view** is the main view for creating individual slides. Use thisview to format and design slides and to add text, graphics, and animation effects.
- **Outline view** shows topic titles, bulleted lists, and numbered lists foreach slide in outline format. Use this view to rearrange the order of slides, edit titles and headings, rearrange the order of items in a list, and add new slides.

- **Notes view** lets you add notes to each slide that are not seen when thepresentation is shown. This is typically used for speaking notes that accompany each slide.
- **Slide Sorter view** shows a thumbnail of each slide in order. Use this view to rearrange the order of slides, produce a timed slide show, or add transitions between selected slides.
- **Handout view** lets you print your slides for a handout. You can choose one, two, three, four, or six slides per page from the Taskspane.

Open, Save and Close a Presentation and Exit the Impress Program

You will make use of the file menu in opening, saving and closing presentations and exiting the programme as you have done in other applications. The file menu in Impress is similar to the one you used inthe other Open Office applications. If you haven't used any of the other applications, you will need to learn how to use the file menu for basic navigation.

As seen in the illustration below, when you click on **File**, you have a selection of actions to choose from. We start off by discussing the basicterms.



New

Used to create a new presentation.

Open

Used to open an existing file from a floppy disk or hard drive of yourcomputer.

Close

Used to close a presentation.

Save

Used to save a file that you have changed. If you close the presentation without saving it, the changes you made will be lost.**Save As**

Used to save a new file for the first time or save the existing file witha different name.

Print

Used to print the presentation.

Exit

Used to exit Impress or any other application in the OpenOffice.orgsoftware suite.

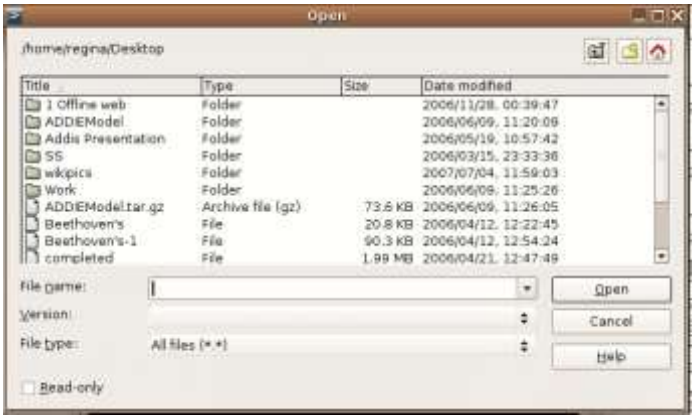
Opening an Existing Presentation Using the File Menu

You can open any presentation that has been named and previously savedfrom the File Menu or with the Wizard

To open an existing presentation:

1. Click the Open existing presentation button.

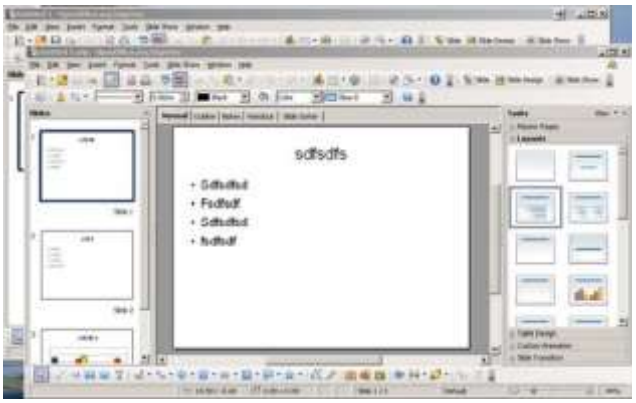
   The Open dialogue box opens.
2. In the Look-in list, click the drive, folder, or Internet address wherethe file that you want to open is located.
3. In the folder list, open the folder that contains the file, and thenclick in the file you want to open.



4. Click the **Open** button. The presentation will open.

Opening more than one Presentation

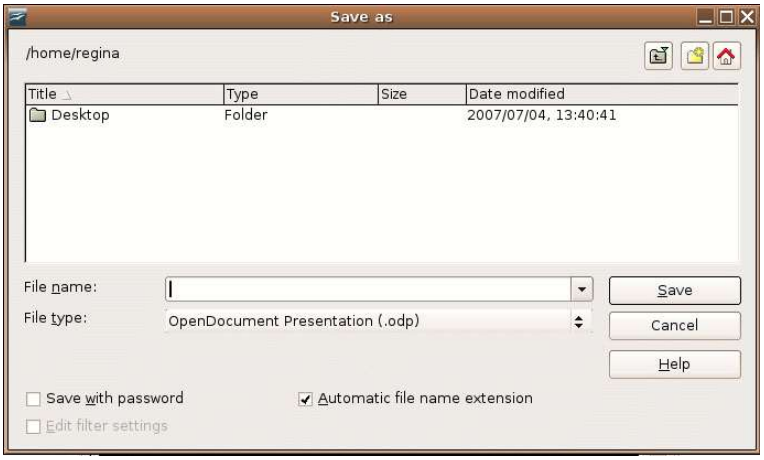
- You can open more than one presentation. Without closing one, just follow the same instructions and open another presentation. You now have two presentations on your desktop, the one on top of the other one.
- You can switch between the two open presentations:



- If your presentations are not maximised (you can see part of the second presentation), you can click on the one that you want to work on. It will move to the front and you can work on it. If you want to work on the one behind, just click anywhere on the presentation and it will move to the front. The active one's title bar will be in the default colour and the other one will be grey.
- If the presentations are maximised, you can work on one, minimise it, and work on the back one. To maximise it again, pick it up from the bottom of your screen.

Saving a Presentation

- You must assign a distinguishable name to every presentation that you create in Impress. If you don't name the file, you won't be able to open and update it in the future.
- The first time you save a presentation, Impress will prompt you to assign a name through the Save As operation. You must then identify the location (folder and sub-folder) on the drive (A:, C:, D: etc) you want to save it to.
- You can make additional changes to a file – add a slide, change text, add a picture, etc. – and then only use the **Save** option. The presentation will be saved to the original location and file name, thus overwriting the previous saved version.
- To save a new Impress presentation:
    1. Choose **File** □ **Save As** from the menu bar.
    2. The Save As dialog box appears.



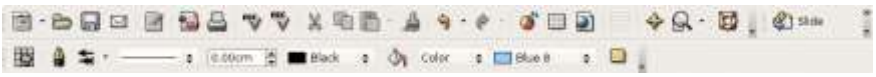
Click on the **Save In**: drop-down menu and locate where you wantto save the file.

Choose:

- 3 ½ Floppy (A:) to save the file to a floppy disk;
- Local Disk (C:) to save the file to your hard disk; or
- D: onwards means any other device you have installed tosave in. It can be a network, flash memory stick or an external hard drive. Check the description.

3. Type a name for your file in the **File name**: box.
4. Click the **Save** button.

To save changes that you've made to an existing presentation:

1. Choose **File** **Save** from the menu bar, or
2. 

Click the Save button on the Standard toolbar (third button from lefton top row).

To save changes that you've made to another presentation/under adifferent name:

1. Choose **File** **Save As** from the menu bar.
2. You can now do one of the following:
    a. Choose an existing presentation that you want to overwrite. Click on the presentation name and hit **Save.**
    b. Type in a new file name to save the current presentationwith the changes to a new name and hit **Save.**
    c. Change the folder of the file, by copying the existing presentation to a new folder under the same or differentname and hit **Save.**
    d. **Saving a Presentation in Different Formats**

If you look at the **File** **Save As** dropdown menu, you will see that thereare several formats that you can save a presentation in. These are:

- ODF Presentation (.odp) – a normal presentation that you canedit in Impress
- ODF Presentation Template (.otp) that you can save as anotherfile, edit and reuse
- various other versions of OpenOffice – both as presentations andtemplates
- various other versions of office applications such as MS Word,StarDraw – both as presentations and templates
- drawing object (image file format) – (odg)

Check the options that are given in the **Save as** type dropdown menu.

Export a Presentation in Different Formats (.pdf and .swf)

If you want to save the file in another format than what is available in thedropdown menu, you

have to export the file to another format.

To execute choose **File Export.** You have several choices, but the following two are useful to save as:

- Portable Document Format (.pdf) gives you the ability to print and send a file in its final form.
- Macromedia Flash file (.swf) gives you the ability to view the presentation as a Flash show. Just remember you have to download the Adobe Flash Reader for reading this file.

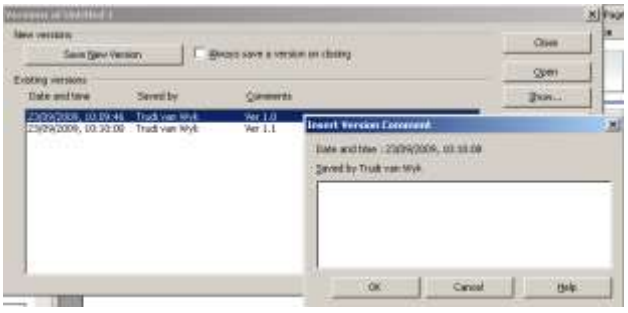
Saving a Presentation in Rich Text Format

To save as Rich Text Format, you must copy and paste the content of your slides from the **Outline View** into Writer and use the **Save As** function in Writer to save as Rich Text Format.

Rich Text formatted files are often called RTF files. RTF files can be opened and used with any word processor, including Open Office, WordPad, Note Pad, Word, and Star Office. An Open Office file can besaved in RTF through Writer. The RTF format can be a good way for Open Office to exchange text files with users of other operating systems such as Microsoft Word.

Saving a Presentation in Different Versions

To save a file as another version, press **File Versions**. Click on the **Save New Version** button. You will be given the option to insert a version comment e.g. Ver1.0. Press **OK**. The versions already saved willbe reflected in the look-in list. Press **Close**.



If you have saved several versions and you want to access them, you can press **File Versions.** In the look-in list, highlight the version you want to open and press **Open**.

Through the same procedure you can also deletea version by pressing **Delete.** After you have completed the action, you press **Close.**

Closing an Impress Presentation

To close an existing presentation chooses **File** □**Close** from the menubar. The presentation in the Impress window closes.

Alternatively – just click on the **Close** button to close the program. Impress prompts you to save your work if you have made any changes tothe presentation between the last save and the time the file is closed.

Exiting Impress

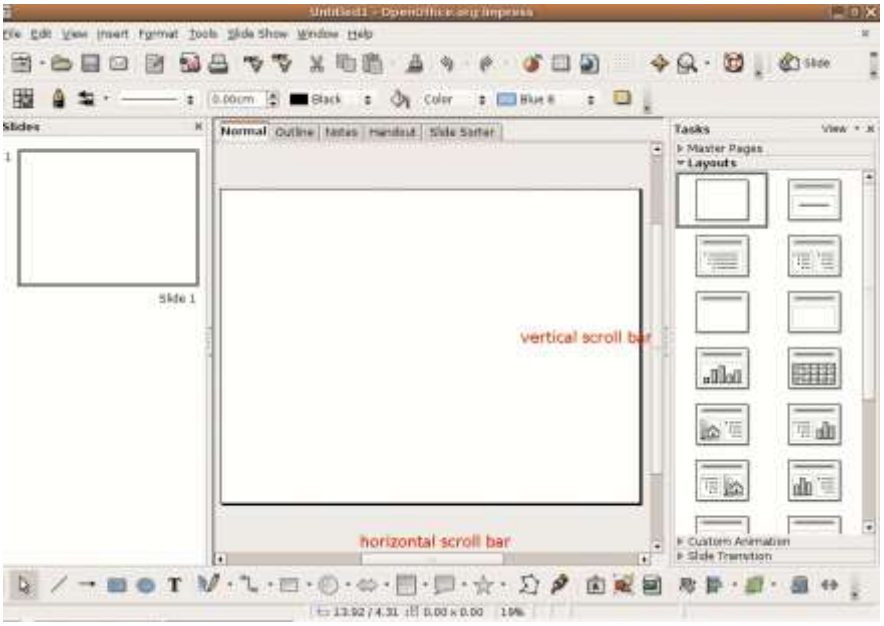
To exit Impress choose **File** □**Exit** from the menu bar.

Slide Navigation – Moving Around the Presentation

You can move around the presentation in several different ways. You willneed to know how to do this in order for you to navigate through your slides and presentation.

Scroll Through a Slide Using Scroll Bars

To move up and down in a presentation slide in the Workspace, particularly when working with magnification, use the vertical scroll barlocated along the right edge of the Workspace. To move left or right, usethe horizontal scroll bar, located at the bottom of the Workspace.



2.8 Creating a New Presentation

Practice makes perfect is the only way to master a presentation. Thefollowing sections will enable you to perform the tasks.

Using Pre-defined Presentation Templates

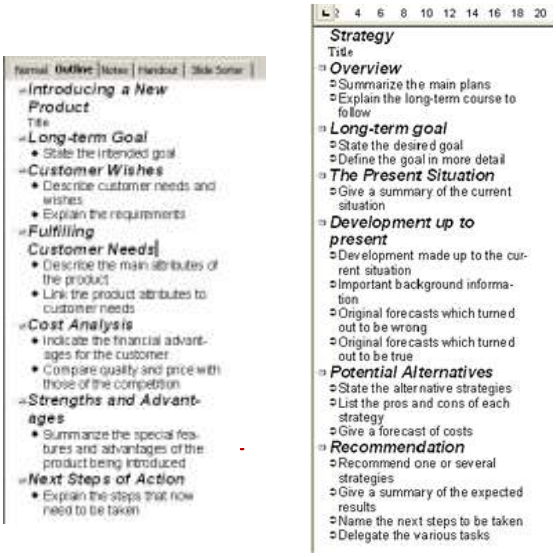
Using Pre-defined Presentation Templates in Your Presentation

Impress comes with two pre-defined presentations that you can copy anduse for your own presentation. Each presentation is formatted and contains pre-written content.

You can select the presentation templates whenever you create a new presentation from a template using the Wizard. You have two options:

- “Introducing a New Product”; or
- “Recommendation of a Strategy”.

Compare the content below:



Remember that you can also change your presentation from the designand content of the template.

Impress is also equipped with different presentation backgrounds that youcan use in your presentation. You can select these presentation backgrounds whenever you create a new empty presentation using the Wizard. Once you make a selection, Impress then displays the available templates for the selected option. If you select one, you will create a similar presentation to the one you see in the thumbnail on the right hand side of your screen.

Creating a Full Presentation from a Template

You are now going to use the Wizard to create a new presentation basedon the full existing presentation template of

"Recommendation of a Strategy".

To create a new presentation based on the pre-designed template:

1. Choose **File** □**New**□ **Presentation** from the menu bar.
2. On the Wizard Presentation dialogue box, click on the **FromTemplate** button.
3. Choose **Presentations.**
4. Choose Recommendation of a Strategy.

5. Click the **Next>>** button to display the second screen of the Wizard.

In this screen you can select the slide design.

1. Select the presentation background to be used in your presentation(check the design in the thumbnail on the right).

2. Click the **Next>>** button to display the third screen of the wizard.

In the third screen you can select a slide transition of your slides:

- Effect – How one slide will change to the following one; and
- Speed – The speed between the transitions (slow/medium/fast).

You can also select the presentation type:

- Default – You can present your slides by clicking the mouse orpress the **Page Down** or →/↓ arrows; or
- Automatic – Your presentation runs automatically and you can set the time you can view a slide and the time to move over to anext slide.

You can also decide if you want to show the logo on each page bymarking the appropriate block.

In order to make these choices:

1. Under **Select a Slide Transition**, click in the drop-down area to select any of the 57 available effect transitions. The right hand areaof the screen provides an example of each effect as you scroll through the available choices.
2. Under **Select a Slide Transition**, click in the drop-down area toselect the Speed of the slide transition (Slow, Medium, or Fast).
3. Under **Select the presentation typ**e, select either Default or Automatic to define whether the presenter will manually advanceslides in the presentation (default), or whether the slides will automatically advance based on Duration of page and Duration ofpause timing definitions.
4. Click the **Next>>** button to display the fourth screen of the wizard.

In the fourth screen you will provide basic information on thepresentation you are developing.

Type information in each of the three questions displayed on the screen:

Click the **Next**>> button to display the fifth screen of the wizard.In the fifth screen, you have to choose your topics or pages.

The presentation comes with seven pre-written slides. Remember, on page 26 we explained that the template has pre-written content under seven headings. These slides/pages are the same as the content displayedon page 26. Please check carefully that you understand where this is coming from.

Here you have the choice to remove/include the content displayed in thetemplate. All slides that contain a checkmark in the **Choose your pages**area will be included in the new presentation. Uncheck any slides that you do not want to include in the presentation.

Click the **Create** button to create the presentation and display the firstslide.

It is advised that at this stage you save your document under a new name.Please be careful in deciding in which folder you save your document.
You must be able to retrieve your document again.

You are now ready to popularize your presentation using the template.You can enter text in all the slides.

Creating a Presentation from Scratch

It is not always convenient to use a template if you have to make too many changes. It is sometimes better to create a presentation from scratch. If you want to create a presentation from scratch, you start thesame way as on page 27.

When you want to do this, first plan your presentation. Write on a piece of paper what you want to put on each slide. Use the information from thefirst section of this module. If you are satisfied with your plan, you can start.

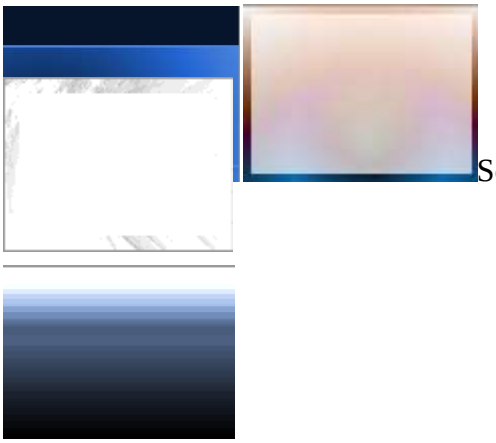
1. Choose **File** □**New** □ **Presentation** from the menu bar.
2. On the Wizard Presentation dialogue box, click on the **Emptypresentation** radio button.

Go through the rest of the screens 2 – 5 as above. On screen 5 you willsee that you cannot choose **Next>>**, choose **Create.**

You will be able to start your presentation from scratch now.

Slide Backgrounds

In the first section you have been introduced to the importance of choosing the right colour and design for a background. Impress hasseveral backgrounds that you can choose from.

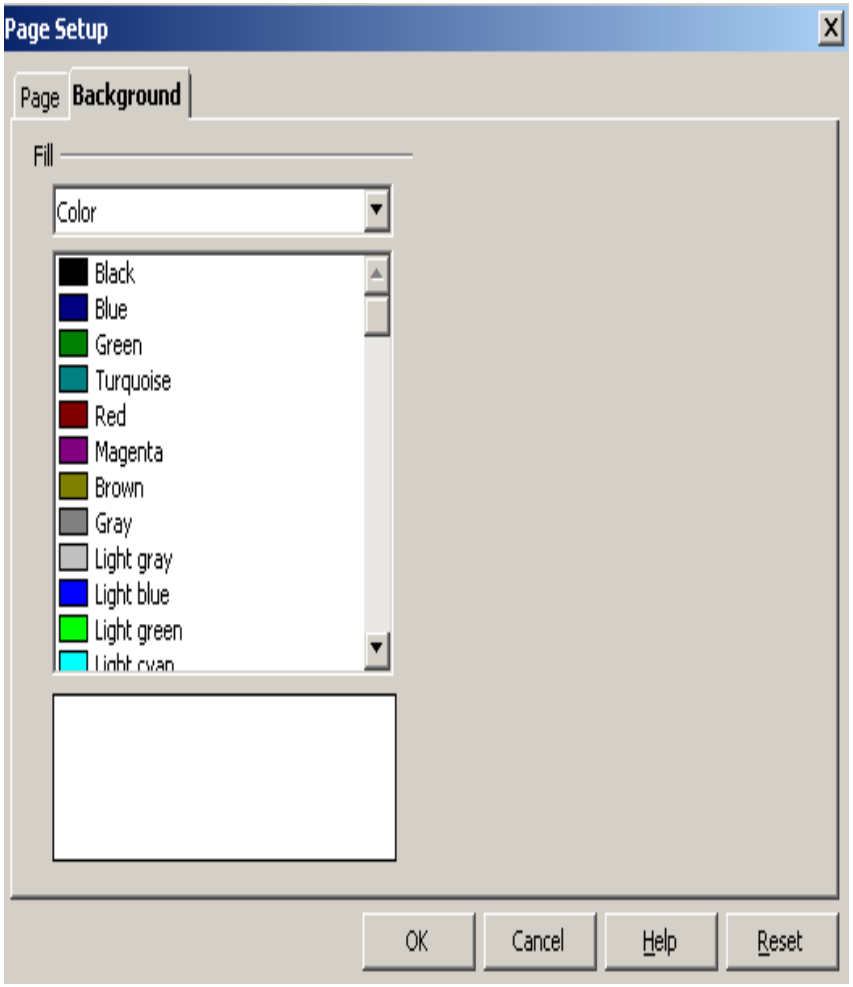
 Some examples are:

Play around with different backgrounds and see for yourself what effectdifferent backgrounds have on a presentation.

You can also just choose a background colour without any design foryour presentations.

On any slide of the presentation, choose **Format Page.**

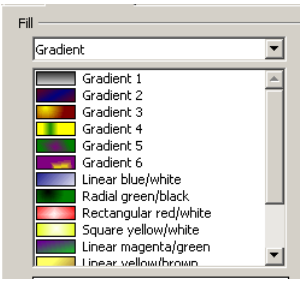
Click on the **Background tab** to access the drop-down menu. Choose

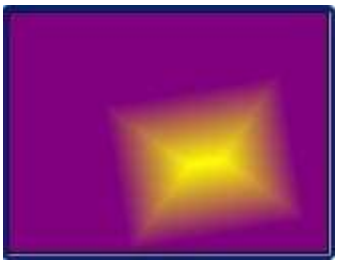


color, and make your choice of colour.

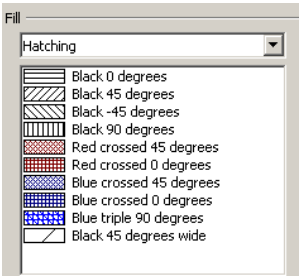
You will be asked:

If you select **yes**, all the slides will have the chosen colour background. If you select **no**, onlythe one slide that you are working on will have the background colour.





By doing the same you can change the background colour to havedifferent appearances e.g.

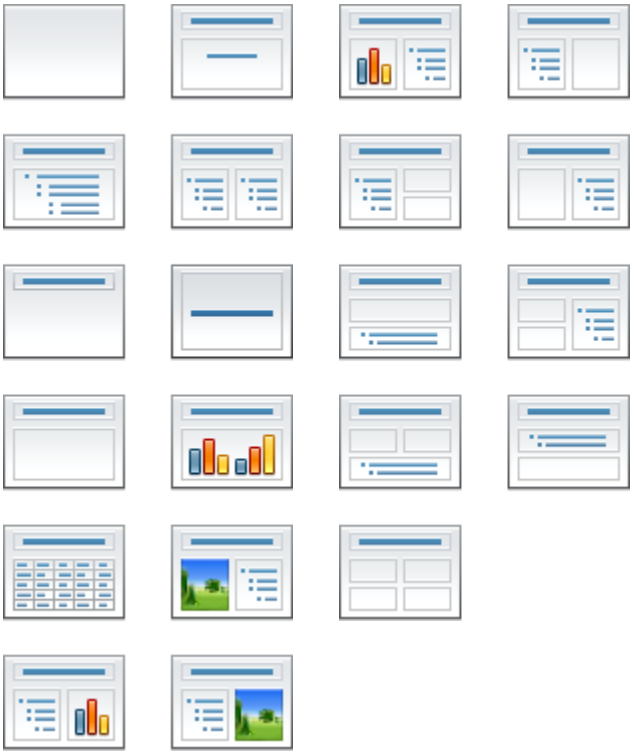


To summarize, if you want to use a bitmap, hatchingpattern for the slide background:

1. Start a new presentation or open an existing one.
2. Click **Format** □ **Page** on the menu bar.
3. Click on the **Background** tab on the Page Setup dialogue box.
4. In the **Fill area**, do one of the following:
    a. Select **Color**, and then click a colour in the list.
    b. Select **Gradient**, and then click a gradient style in thelist.
    c. Select **Hatching**, and then click a hatching style in thelist.
    d. Select **Bitmap**, and then click a bitmap style in the list.

5. Click the **OK** button.
6. Click either the **Yes** or **No** buttons in the Page Settings dialogue box to answer the question to change the "Background settings forall pages"
7. **Slide Layouts**

Impress allows you to select from many different Layout slide templatesto use in your presentation. Impress prompts you to assign a layout eachtime you add a new slide. You can change the layout assigned to any slide in the presentation at any time.



The type of slide layout you should use depends on what you want to include into your presentation, whether it is to add only text or add text,graphics and charts.

To apply a layout to an existing slide:

1. Click on an existing slide without text in the slide pane to

activate itin the Workspace.

2. Ensure that the Layout menu is active on the right-hand side of thescreen by either clicking on the Layouts bar or choosing **Format □ Slide Layout** from the menu bar. On the right a variety of thumbnail layout slides will appear.
3. Click on the appropriate layout slide (thumbnail) to apply thatlayout to your slide.

Once you have clicked on the thumbnail it will apply that layout to yourcurrent slide.

2.9 Adding, Copying and Deleting Slides

Inserting Slides

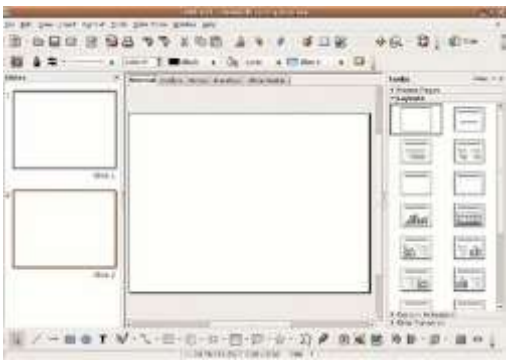
Each Impress presentation that you create will begin with a single slide.After you change the opening slide, you'll want to add more slides to your presentation. The number of slides that you add to the presentationis dependent on the length of your presentation.

To insert a new slide in a presentation you can do one of four actions:

1. Choose **Insert □ Slide** from the menu bar. A new slide will be added after the active slide on your Workspace. The slide will havethe same layout as the slide on your workspace.

2. You can also hit the Slide button on the tool bar. A new slide will be added after the active slide on your Workspace. The slidewill have the same layout as the slide on your workspace.
3. Another way to insert a slide is to go to the slide pane, click on a slide to activate it in your workspace, right-click and select **Slide □ New Slide** from the menu. A new slide will be added after the one that you have first clicked on. The slide will have the samelayout as that slide on your Workspace.
4. You can also go to the position for the new slide on the slide pane (between two slides), right click and hit **new slide**. The new slide will have the same format as the previous one.

After you have inserted the slide, you can change the layout by clicking on any of the 20 different Layout thumbnail images in the Task pane toapply that design to the new slide.



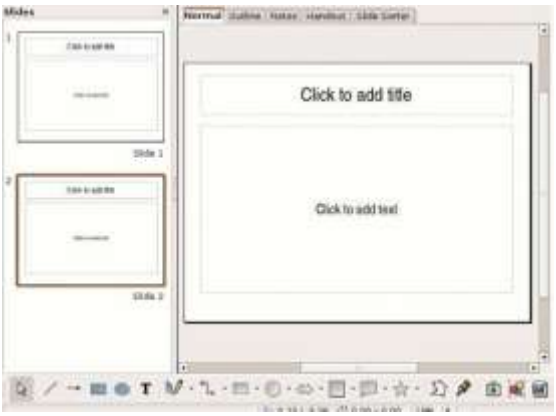
Duplicating Slides

Duplicating or copying a slide is another technique that you may use asyou work on your slide presentation. For example, you may want to repeat a slide later in the presentation or copy a slide and make small changes to it to make a different point. When you duplicate a slide, youmake an exact copy of it.

To duplicate a slide in the presentation:

1. Navigate to the slide that you would like to duplicate, either by paging through the presentation in the Workspace or by selectingthe slide on the Slide Pane.
2. Choose **Insert** □ **Duplicate Slide** from the menu bar.

3. A new slide, an exact duplicate of the original slide, will appear at the bottom of the original slide and will be displayed on the screen.



You can now move the slide to another position by dragging it onthe slide bar.

To duplicate a slide in the presentation, you can also copy and paste it tothe position you want it to appear:

1. Navigate to the slide that you would like to duplicate, either by paging through the presentation in the Workspace or by selectingthe slide on the slide pane.
2. Click on the slide on the slide pane so that it is highlighted.
3. Do one of the following:
    - Choose **Edit** **Copy** from the menu bar
    - Right-click and choose **copy**
    - Press on the tool bar
    - Press **Ctrl+c**
4. Move to the desired location for the slide to appear on the slidepane and paste it by:
    - Choosing **Edit** **Paste** from the menu bar
    - Right-click and choose **paste**
    - Press on the tool bar
    - Press **Ctrl+v**

A new slide, an exact duplicate of the copied slide, will

appear atthe pasted location and will be displayed on the screen.

You can use the same procedure to copy slides from one openpresentation to another.

Follow the following steps:

1. Ensure that both presentations are open on your desktop.
2. Follow steps 1 – 3 on the presentation that you want to copyfrom.
3. Activate the second presentation (see page 16).
4. Follow step 4 above.

Deleting Slides

Sometimes you may want to take one or more slides out of your presentation. With Impress, you can delete any slide from a presentation,even if it has text or a picture on it.

To delete a slide from the presentation:

1. Navigate to the slide that you want to delete from the presentation,either by paging through the presentation or by selecting the slide on the slide pane.
2. Do one of the following:
    - Choose **Edit Delete Slide** from the menu bar
    - Press the **delete** key
    - Right click and choose **Delete Slide** from the shortcutmenu
    - Press **Ctrl+x**

If a dialog box appears (if the slide you are deleting contains informationon it and you have used the first option), click the **Yes** button to remove the slide and all the data on it.

2.10 Introduction of Spreadsheet

A spreadsheet is a table of rows and columns, creating a grid of cells in which numeric or text values are displayed. In most situations, spreadsheets are used for manipulating numeric data. The spreadsheet computer application is designed to enable you to model and observe the relationships among data in the respective rows and columns.

Spreadsheets can be useful in a variety of contexts, e.g., to analyze business data, to track personal finances, or to create charts for visualinterpretation of data.

The two features of a good spreadsheet are:

- Good data, and
- Good design. Good design makes it easier to enter data andretrieve valid results. Poor design can make a spreadsheet unusable despite having excellent data to work with.

2.11 Spreadsheet and its Business Applications

The spreadsheet has been instrumental in helping personal computers gain widespread acceptance in the business community. Called a "killer" application, spreadsheets made such an immediate impact on financial accounting that businesses couldn't afford to not take notice.

Spreadsheets, in their original paper form, have been used in financial accounting for hundreds of years. A spreadsheet is a large sheet of rows and columns that lays out information about a financial transaction, including things like costs, taxes, income, etc., so that a business person or manager can easily make decisions.

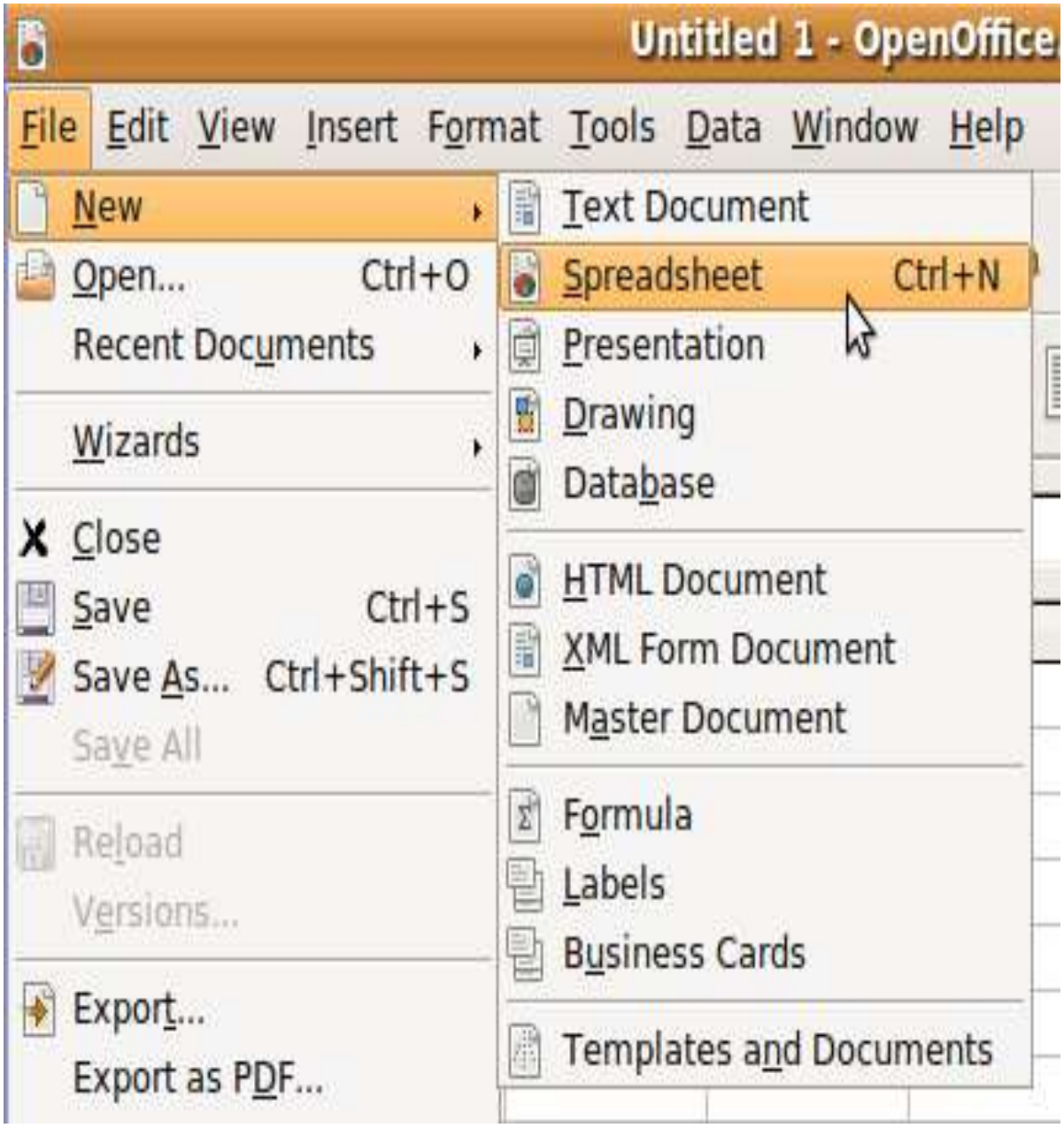
2.12 Managing worksheets

Creating a new spreadsheet

When you launch the Calc application, a blank spreadsheet is created foryou automatically. To create a new spreadsheet from

within the Calc application:

1. Click on **File** on the menu Bar.
2. Click on **New** on the drop down menu.
3. Click on **Spreadsheet**. This will display a blank spreadsheet.

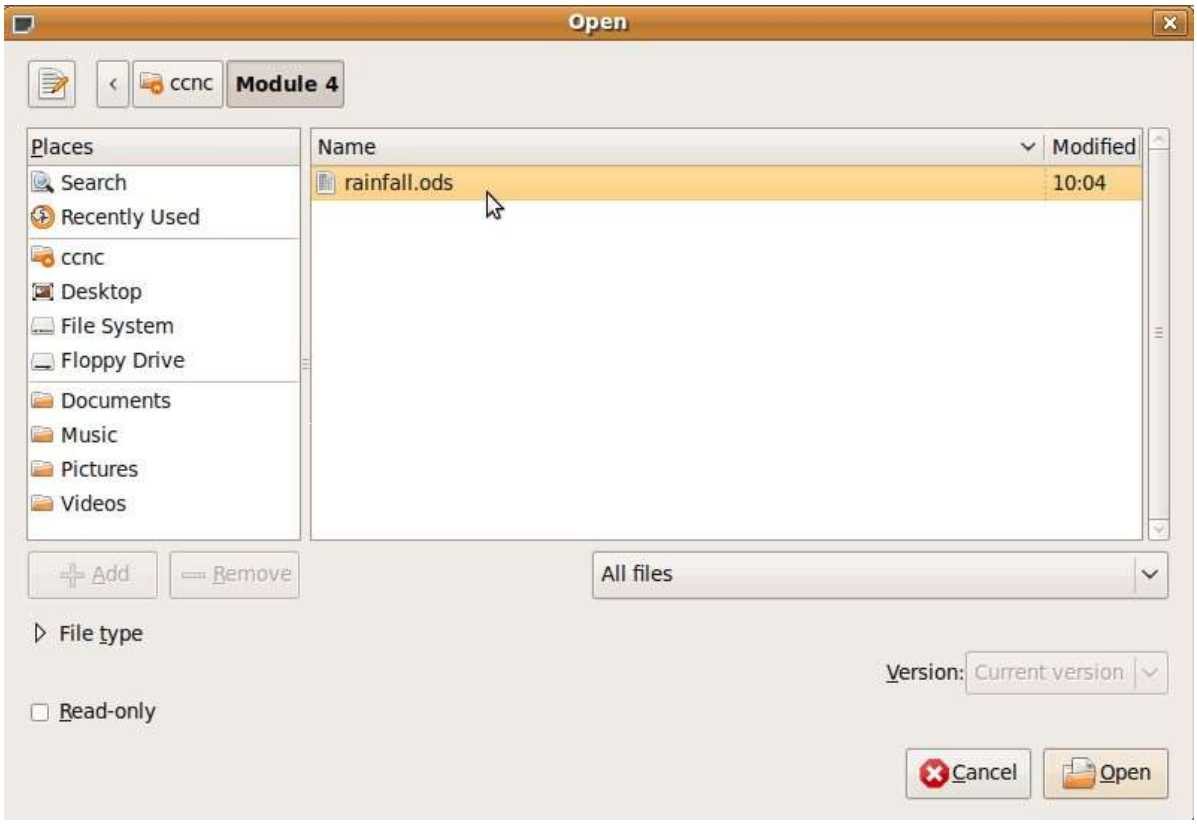


Your work area is one of the worksheets of the spreadsheet that you are working on. The tabs in the bottom left corner of the work area allow youto switch between worksheets. If the tab for Sheet 1 is highlighted, then itis the first worksheet that is being displayed. If you click on Sheet 3, thenthe third worksheet replaces the first on the screen. The spreadsheet consists of all these worksheets.

A spreadsheet consists of text, numbers and formulas that are entered intothe cells of its worksheets. Collectively, text, numbers and formulas are referred to as data. Spreadsheets that contain data are saved as files, just as in the case of word processed documents.

Opening an existing spreadsheet from within Calc

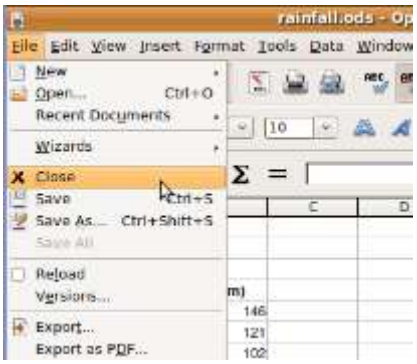
1. Click on **File** in the menu bar.
2. Click on **Open**. This brings up the **Open Dialogue** window. Thedialogue lists a series of directories and files.
3. Locate the directory in which the desired file is held.
4. Click on the directory to open it.
5. Highlight the file.
6. Click **Open**.



Closing a single spreadsheet

Before we perform this task, we need to be clear about the difference between the **'close'** and **'exit'** commands. **Close** closes the spreadsheet, but leaves the program **Calc** and other spreadsheets open. **Exit** closes the spreadsheet you are working on, any other spreadsheet that is open, as well as **Calc**.

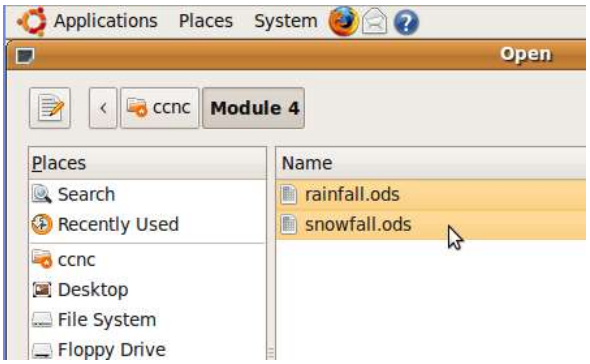
1. Click on **File** on the menu bar.
2. Click on **Close**. This command is in the top section of the dropdown menu. **Exit** is in the bottom section.



Working with multiple spreadsheets

If you need to work on more than one spreadsheet at the same time, you can open multiple spreadsheets and move between them. You may wantto do this if you need to copy data from one spreadsheet to another.

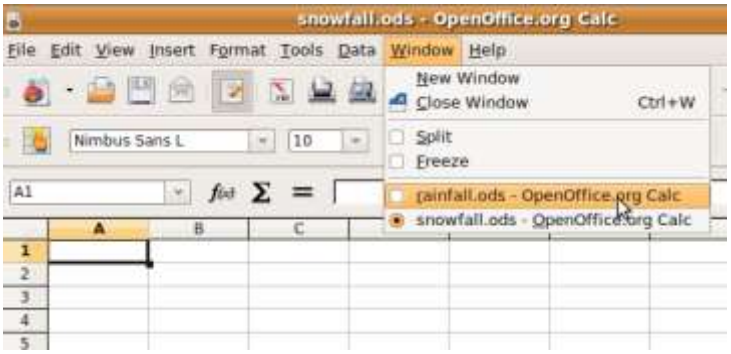
1. Click on **File** then **Open**.
2. Locate the directory containing the files you wish to open.
3. Click on the first file.
4. Hold down the **CTRL** key and click on each of the additionalfiles you wish to open.



5. Click **Open**. The last of the files loaded will appear in the window. This will be the active spreadsheet. The others are alsoloaded but are in the background.

You can make one of the other spreadsheets active as follows:

1. Click on **Window** to list the spreadsheets that are loaded.
2. Click on the spreadsheet that you wish to make active.



Close more than one spreadsheet

If you wish to close some but not all the spreadsheets you have loaded, then you will use the **Close** command for each separately. If you want toclose all spreadsheets as well as exit CALC, then you will use the **Exit** command.

Saving spreadsheets

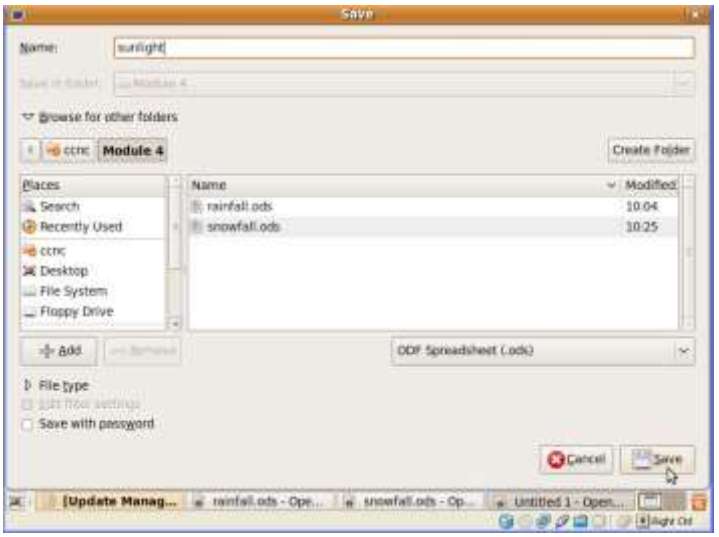
You will want to save your documents often so that you don't lose data ifyour computer crashes or if your application is inadvertently closed. If you exit the application without saving, Calc will prompt you to save your work.

Saving on the hard drive of your computer

1. Click on **File**, then click **Save As**. This will bring up the

Save Asdialogue.

2. Locate the drive and /or the directory in which you wish to save the file. You can save files to your hard drive, floppy drive, FlashMemory stick, or many other storage memory devices.
3. Enter the name of the file in the **File Name** window.
4. Click **Save.**



Save an existing file under another name

Sometimes we may want to have the same spreadsheet saved under a number of different names. Alternatively, we may want to save a spreadsheet before making changes. We would then have a copy of thenew version as well as the version before changes were made. Supposewe have a spreadsheet loaded as shown below. In this case the spreadsheet already has the name demo.sxc.

We can now save what is displayed on the screen in two ways:

- As the existing file: After loading demog.sxc from the hard disk,we made some changes to it. Those changes exist only

on the version on the screen and will not automatically be made to the file that is located on the hard disk. To replace the version on thehard disk with the contents as displayed on the screen.

Click on **File**, then **Save**. Under another name: Suppose we do not want to overwrite the contents on disk but would still like to save what is on the screen.

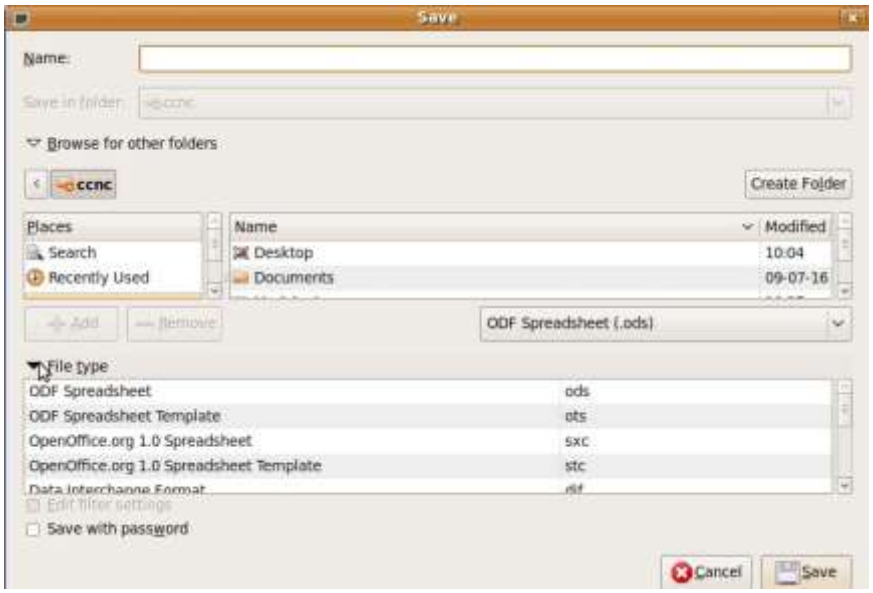
Click on **File**, then **Save as**.

This will bring up the **Save As dialogue**. You use this in exactly the same way as you would if you were saving a completely newfile.

Save in another file type

Sometimes it is useful to convert the spreadsheet format into another format, for example, a text file that can be manipulated using a word processor. Alternatively, you may wish to save the spreadsheet in a format used by another spreadsheet program such as Microsoft Excel. Tosave a spreadsheet in a different format:

1. Click on **File**, then **Save as**
2. Click on the **File Type** window. This will display a list of file types
3. Use the vertical scroll bar to view all the file formats.



The following table lists some of the main file formats and a briefexplanation of each.

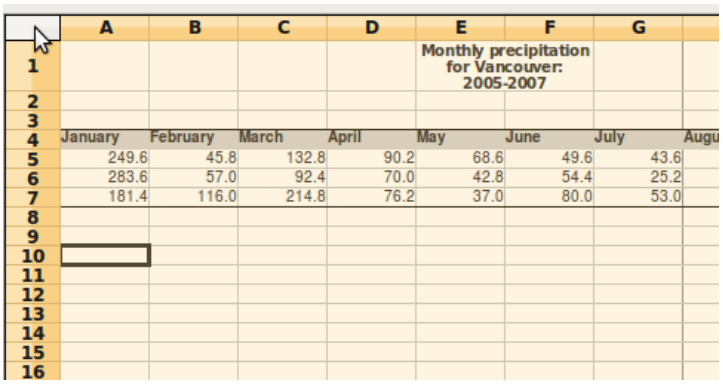
File type	**Extension**	**Explanation**
OpenOffice.org Calc Spreadsheet	sxc	This is the format of Calc itself
OpenOffice.org Spreadsheet template	stc	A template is an outline for new templates. This may include text, values and formulas that are automatically inserted when a new template is created using template. It could also include formatting of cells such as font type and colour.
dBase	dbf	This would save the spreadsheet in a format used by some database programs. These

2.13 Formatting

Selecting cells and cell ranges

In Calc you select cells with your mouse:

1. If you want to select a group of cells in a single row, click on the left-most cell, hold the left mouse button down, and drag your mouse to the right (alternatively, click on the right most cell, holdthe left mouse button down and drag left).
2. If you want to select a group of cells in a column, click on the topmost cell and drag down, or click on the bottom most cell and drag up.
3. If you want to select a group of cells spanning a number of columns and rows, click on one of the corner cells in the range
4. you want, and drag left or right and up or down until the rangeyou want is selected.
5. To select a whole row, click on the row heading (the numberalong the left side of the worksheet).
6. To select a whole column, click on the column heading (the letterat the top of the worksheet).
7. If you want to select the whole worksheet, click on the top leftcorner of the worksheet (to the left of column heading **A** and above row heading **1**).



	A	B	C	D	E	F	G
1					Monthly precipitation for Vancouver: 2005-2007		
2							
3							
4	January	February	March	April	May	June	July
5	249.6	45.8	132.8	90.2	68.6	49.6	43.6
6	283.6	57.0	92.4	70.0	42.8	54.4	25.2
7	181.4	116.0	214.8	76.2	37.0	80.0	53.0
8							
9							
10							
11							
12							
13							
14							
15							
16							

Formatting cells

You've already learned how to format cells for the type of data they contain (numerical, date, or text). You can also apply many of the formatting options that are available in other applications such as Writer.

As in other applications, the objective of adding formatting is to enhancethe visual appearance of your documents in order to make them more readable and better understood.

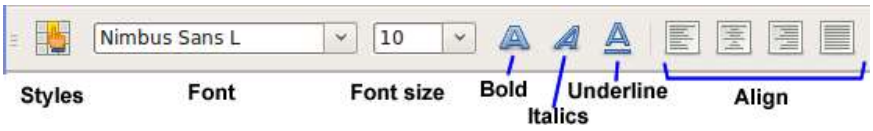
Formatting appearance

You can format the appearance of cell contents by applying font choices,borders and shading, and alignment.

Font appearance

1. Select the cells you want to format.
2. From the formatting toolbar, apply the font formatting optionsyou want.

   For your precipitation spreadsheet, bold the column headings(months).

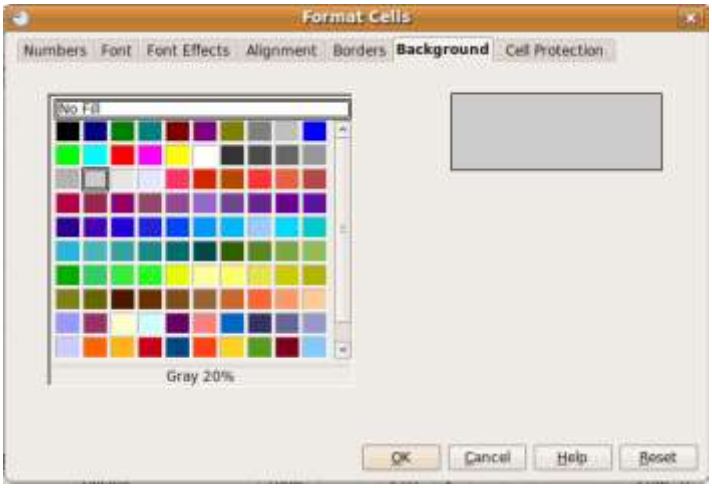


Borders and shading

Borders and shading can help make your worksheets more readable byproviding emphasis to some of your worksheet cells. For example, row and column headings can be shades to set them off from the rest of the data. Cells that form a table can be enhanced by placing a border aroundthem.

To apply shading:

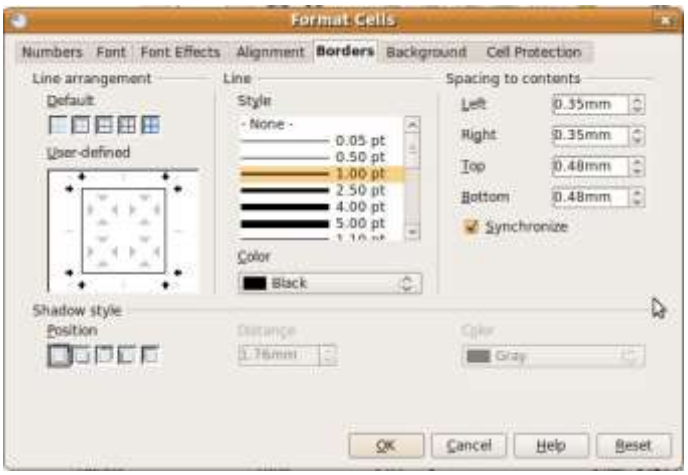
1. Select the cells you want to shade.
2. Choose **Format->Cells** from the Calc menu.
3. Click on the **Background tab**.



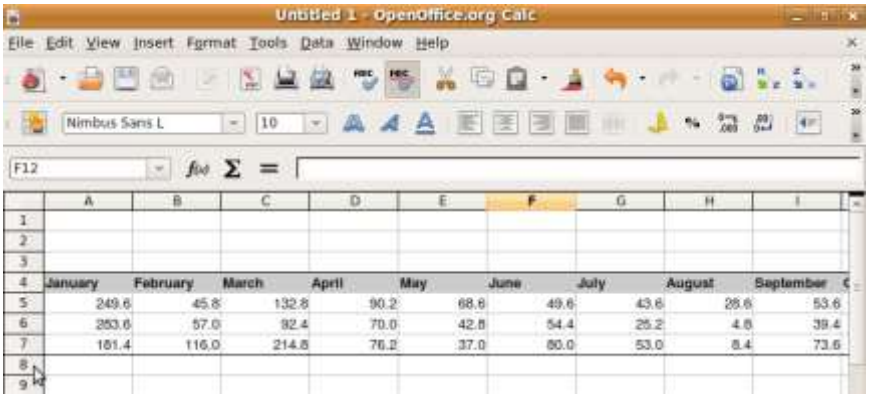
4. Choose a background colour for your cells.

To apply borders:

1. Select the cells you want to apply a border to.
2. Choose **Format->Cells** from the Calc menu.
3. Click on the **Borders tab**.
4. Choose the line arrangement for borders. The default settings areno border, outside border, outside border with horizontal inside border, or outside and inside borders. Further, you can set you own borders by using the user-defined option.
5. Choose the line style and colour.
6. Choose the border spacing.
7. If you like, include a shadow for your bordered section.



Here is what our precipitation worksheet looks like with bold, shading,and borders applied:

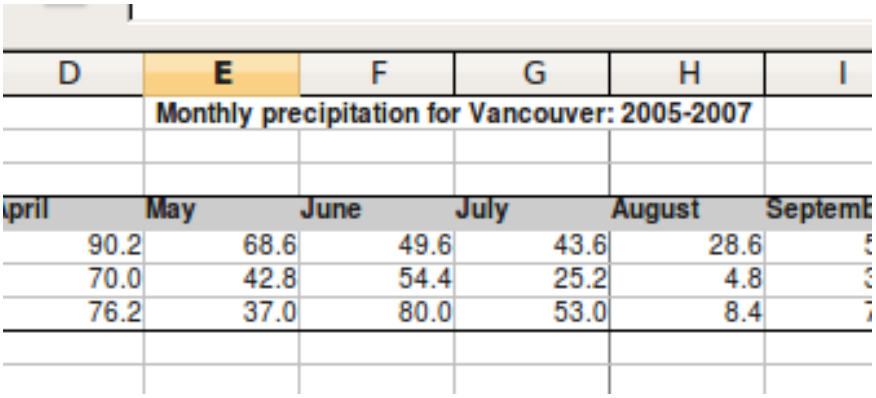


Merging cells

You may find that you want to create an area for information that is larger than a single cell. Calc gives you the option of merging cells to make a larger area. (Please do not confuse it with Mail Merge in Writer)The merged cell acts as one cell.

To merge adjacent cells:

1. Select the cells you want to merge.
2. Choose **Format->Merge Cells** from the Calc menu.



3. Place your content into the merged cell.

Copying and Moving cells

To copy cells:

1. Select the cells you want to copy.
2. Choose **Edit->Copy** from the Calc menu.
3. Click where you want the cells to be placed.
4. Choose **Edit->Paste** from the Calc menu.

To move cells:

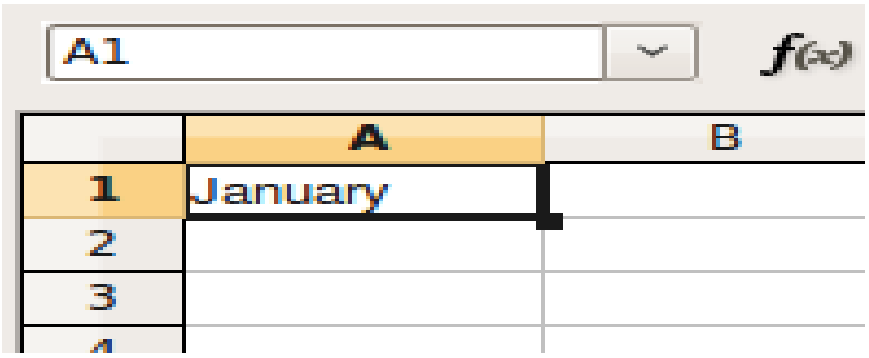
1. Select the cells you want to copy.
2. Choose **Edit->Cut** from the Calc menu.
3. Click where you want the cells to be placed.
4. Choose **Edit->Paste** from the Calc menu.

Using Autofill

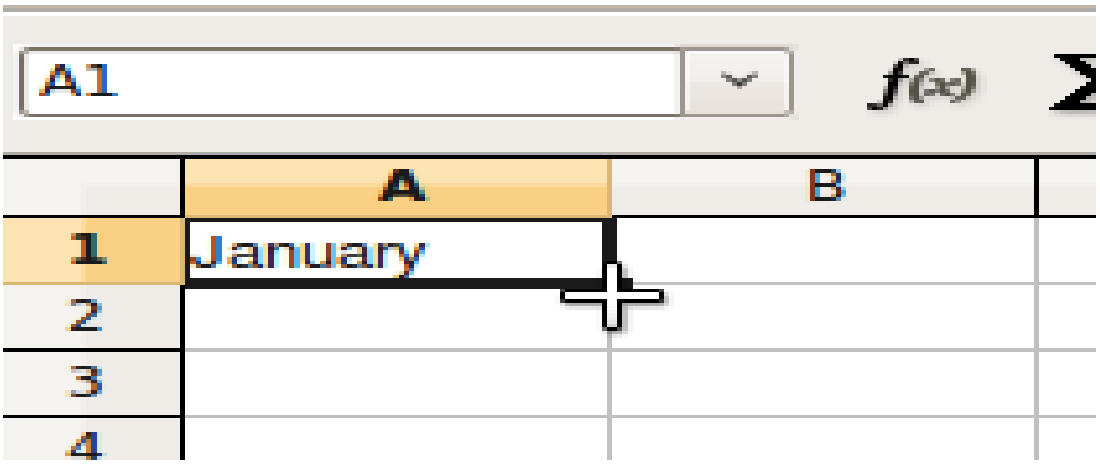
Auto fill is useful if you are placing the same content in the cells of a column, or when you are placing incremental content (e.g. the months ofthe year) in the cells of a column.

To use Auto fill with incremental content:

1. Type the first entry into a cell (for example, **January**)



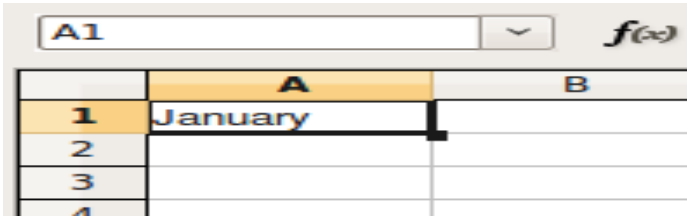
2. Click somewhere else on the worksheet (click out of the cell). Then move your mouse to the bottom-right corner of the cell withthe data in it, until your cursor turns to a crosshair.



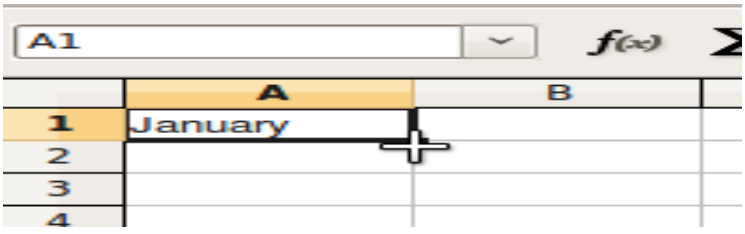
3. Hold the mouse button down, and drag down the column tocomplete the Auto fill.

To use Autofill with repeating content:

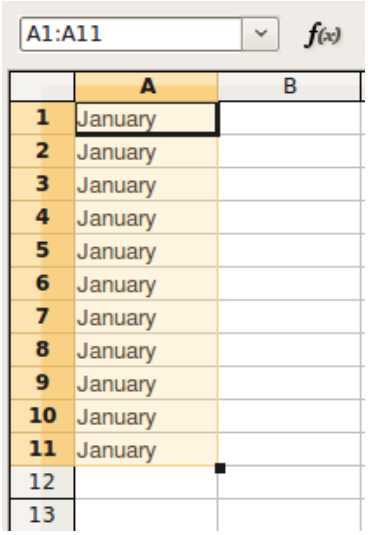
1. Type the first entry into a cell (for example, **January**)



2. Click somewhere else on the worksheet (click out of the cell). Then move your mouse to the bottom-right corner of the cell withthe data in it, until your cursor turns to a crosshair.



3. While pressing the <Ctrl> key, hold the mouse button down, anddrag down the column to complete the Autofill.



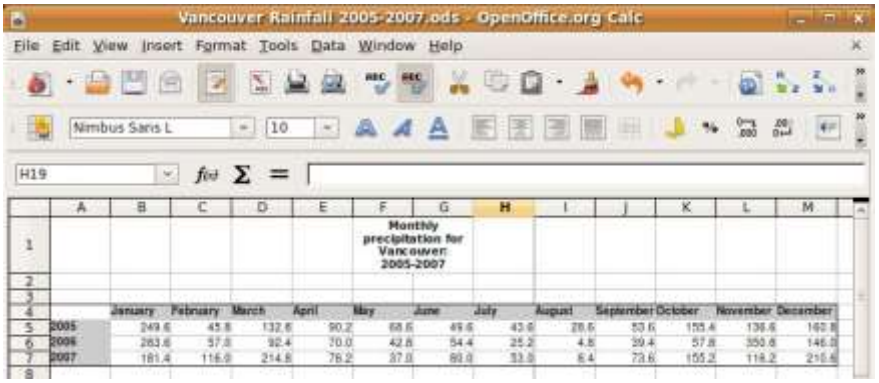
Working with rows and columns

Earlier you learned how to select a whole row or column by clicking on the row headings and column headings. When you select rows or columns, any of the formatting options you apply are applied to the wholerow or column. You can also set the row height and column width to fit your data, and insert or delete columns or rows as needed.

Inserting and deleting rows and columns

To insert a row or column:

1. For rows, click on the row heading where you want the new rowto be created.
2. Choose **Insert->Row** from the Calc menu.
3. The new row is inserted above the row you selected.
4. For columns the process is the same, using the column heading.



Delete a row or column

1. For rows, select the row or rows you want to delete.
2. Choose **Edit->Delete cells** from the Calc menu.
3. For columns the process is the same.

Formatting rows and columns

Row height

You can set the height of a row manually by dragging on the bottom ofthe row header, or by using the menu options. The menu options give much greater control over the row height:

1. Select the row or rows you want to format.
2. Choose **Format->Row->Height** from the menu.
3. Type in the height you want to set the rows. All of the rows youhave selected will change to that height.

Column width

1. Select the column or columns you want to format.
2. Choose **Format->Column->Width** from the menu.

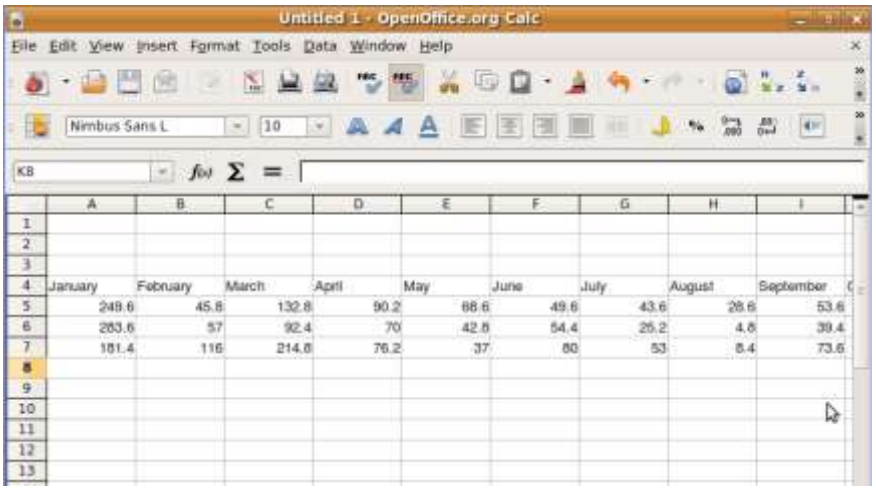
3. Type in the width you want to set the column. All of the columnsyou have selected will change to that width.

2.14 Entering data

Entering data in cells

We enter data into cells by clicking on a cell and typing in our data using the keyboard. Remember that it's good practice to leave a few blank rowsat the top of a worksheet for totals, headings, etc.

1. Enter the months of the year in Row 4 of your spreadsheet. Theseare our column headings.
2. To move vertically or horizontally in a spreadsheet, either useyour mouse to click on the next cell, or use the arrow keys onyour keyboard.
3. To enter a list of data, enter the data for the first cell and then type the **<Enter>** key to go to the cell directly below. Keep doingthis for each column until the list is finished.
4. Enter the precipitation measurement for each month in the three rows beneath the column headings. Your spreadsheet should nowlook like this:



Editing data

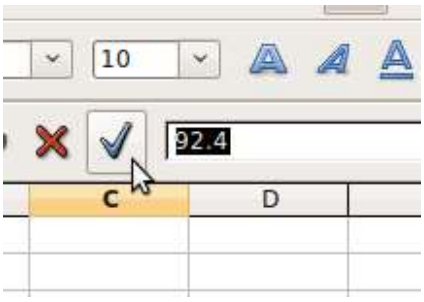
If you make a mistake entering data into cells, you can correct it easily byclicking on the cell and typing the new data. You can do this either in the cell itself or in the input line in the spreadsheet:

To edit data in the cell:

1. Double-click in a cell, and then highlight the data you want toreplace.
2. Type in the new data.

To edit data using the input line:

1. Click inside the cell.
2. In the input line, highlight the data you want to replace.
3. Click on the Checkmark to accept the new data.



Using Undo/Redo

If you make a mistake when you are inputting data, applying formatting, or just about an other action in Calc, you can usethe Undo button to go back one step.

The Redo button will take an action you have just finished and repeat it. This is handy if you need to repeat the same action ona number of cells.

Numerical data

Calc tries to interpret whether the data in our spreadsheet is numerical ortext. By default, text data is aligned to the left of a cell, and numerical data is aligned to the right.

Numerical data can be formatted a number of ways, depending on the nature of the data. For example, our precipitation data is an integer withone digit after the decimal point.

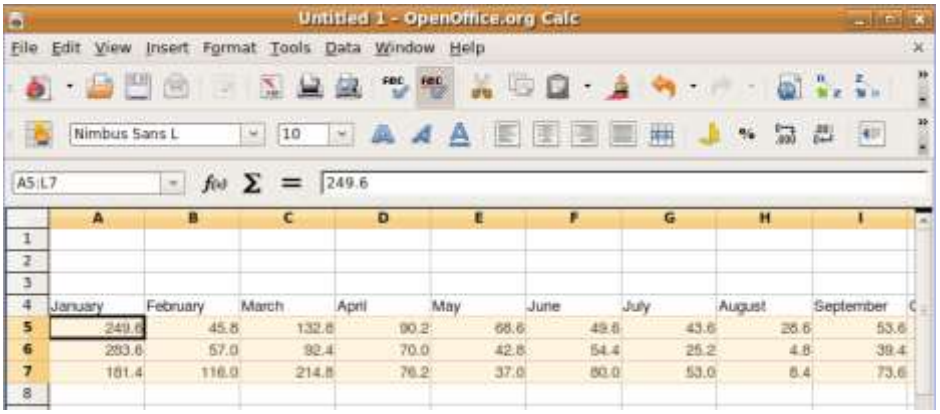
To set the type of numerical data in a spreadsheet:

1. Select the cells you want to format
2. Choose **Format->Cells** from the Calc menu.
3. Choose the category:
    - Number: for general numerical data
    - Percent: display numerical data as a percent
    - Currency: for currency data. Negative values aregenerally displayed in red type.
    - Date: To display data as a date, in a variety of formats.
    - Time: To display data as a time, in a variety of formats.
    - Scientific: for exponent data.
    - Fraction: to display numbers as fractions.
    - Boolean value: displays **True** or **False**.
    - Text
4. Choose the format. For numerical data, your choice is with or without a comma separating the hundreds, thousands, millions,etc.

5. Choose the number of places after the decimal point.

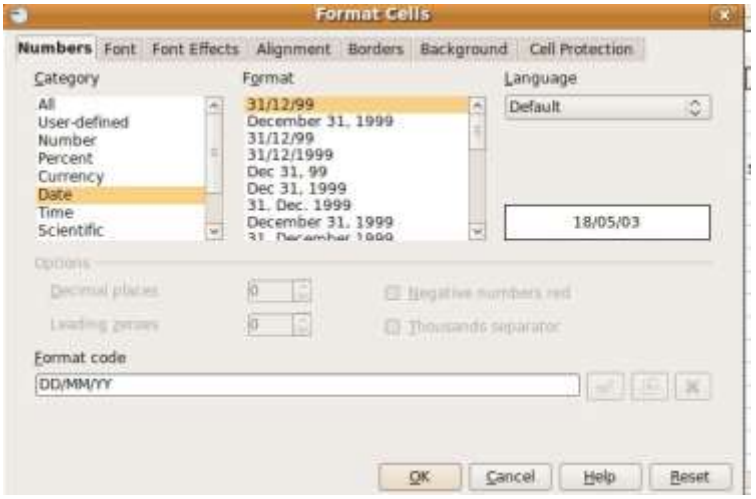
We can see from the data in our spreadsheet that if the digit after the decimal point was zero, it was automatically dropped. Change the dataformat for all of our cells to include 1 digit after the decimal point.

Your worksheet should now look like this:



Date format of data

You can format a cell that contains date data a number of different ways:



- **Long text:** December 31, 1999
- **Abbreviated text:** Dec. 31, 1999
- **Numerical format:** 31/12/1999
- **Abbreviated numerical format:** 31/12/99

Replacing text or data

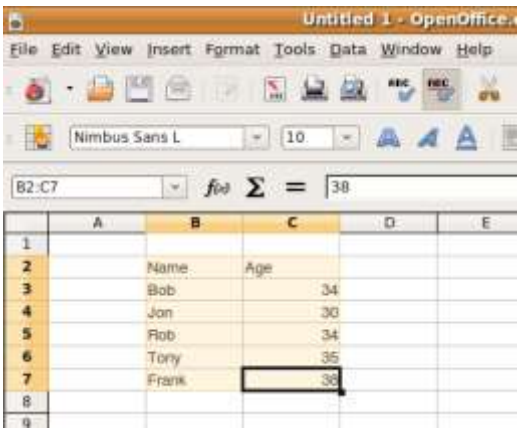
1. Choose **Edit->Find & Replace** from the Calc menu.
2. In the **Search for** box type the text or data you want to searchfor.
3. In the **Replace with** box, type in the text or data you would liketo replace the search term with.
4. You can either replace instances of the search term all at once, orone at a time.

Sorting data

As much as possible, it is helpful to sort the data you are working with ina way that makes sense. For example, you may want to sort rainfall data from largest to smallest amount. You may want to sort birth date data chronologically. Or you may want to sort name data alphabetically.

To sort data in a Calc worksheet:

1. Highlight the cells that you want to sort.

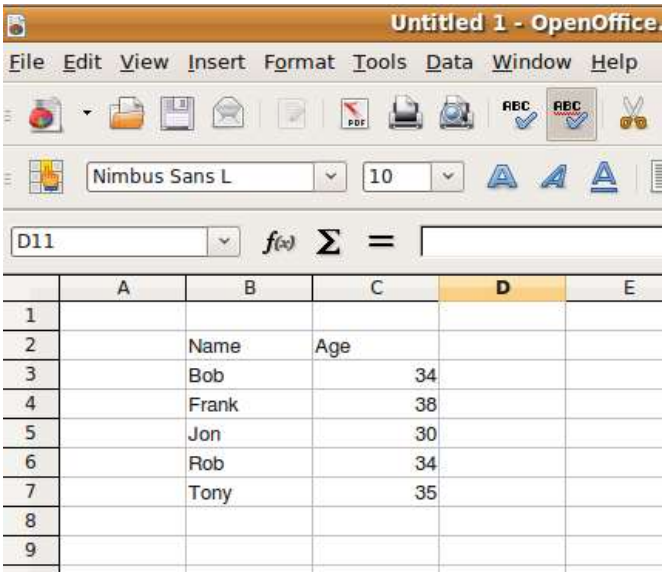


2. Choose **Data->Sort** from the Calc menu.
3. Select the sort criteria you want to use first, and then

choose tosort either in ascending or descending order. If you like, set further sort criteria. These will be applied in order (e.g. first byname, in ascending order alphabetically, then by age, in ascending order).

4.

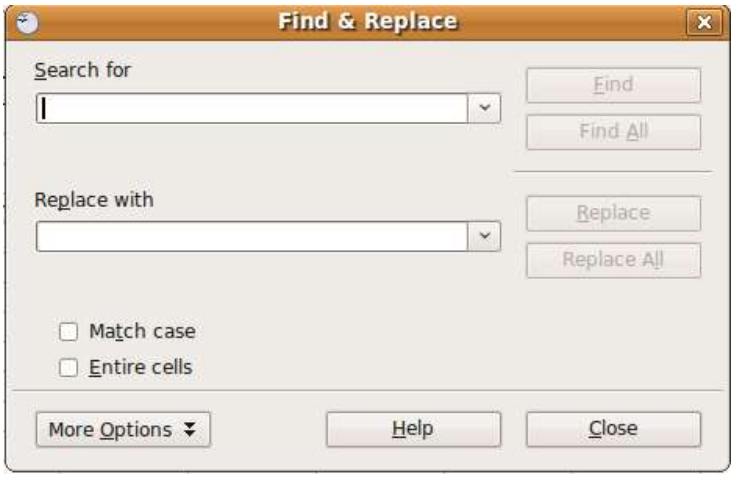
5. View the results.



Using Find and Replace

Find and replace in Calc functions much like in Open Office Writer.Finding text or data:

1. Choose **Edit->Find & Replace** from the Calc menu.



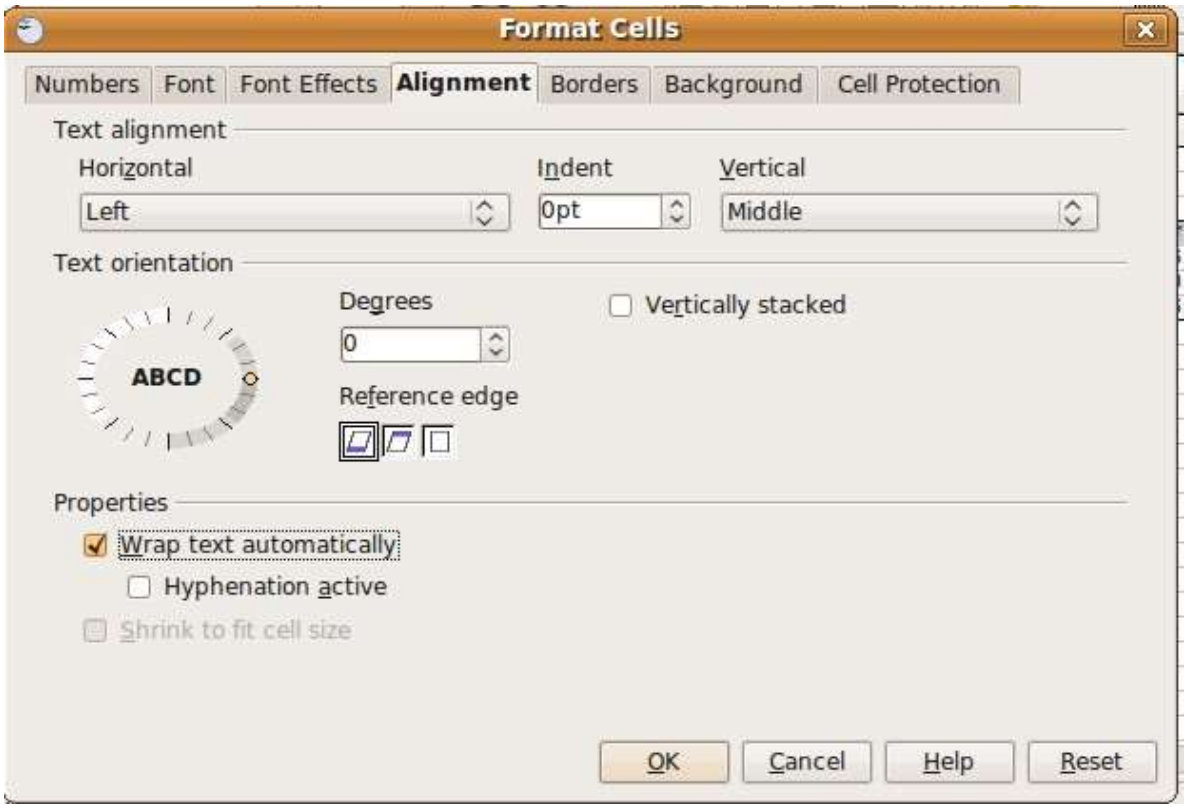
2. In the **Search for** box type the text or data you want to searchfor.
3. Click on the **Find** button to find the first instance of your searchterm.
4. Clicking again on the **Find** button will search through thedocument to find further instances of your search term.

Text wrapping

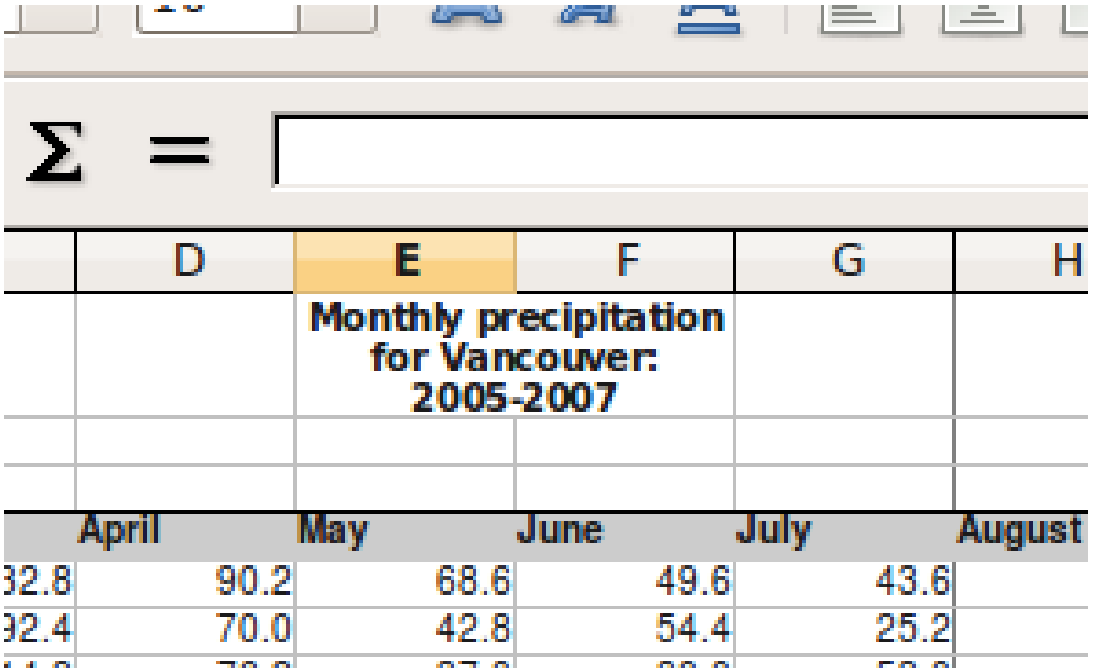
If the content you want to place in a cell is too long for the cell, you canchoose to wrap the text so that it will go on to a second line once it reaches the full width of the cell.

To wrap text in a cell:

1. Select all the cells that you want the text to break at the rightborder.
2. Choose **Format->Cells** from the Calc menu.
3. Click on the **Alignment tab**.
4. Check the box for Wrap text automatically.



It will look like this:



2.15 Editing a worksheet

We now move from working with cells, rows, and columns to working with worksheets. You can think of a worksheet as the basic functional unit of your spreadsheet – it can contain the data from cells, the functionsthat are used to modify the data, and graphs and charts to interpret the data. The worksheet can stand on its own as a document.

Rename a worksheet

The default names of worksheets are Sheet1, Sheet2, and Sheet3. Youcan change the name of a worksheet as follows:

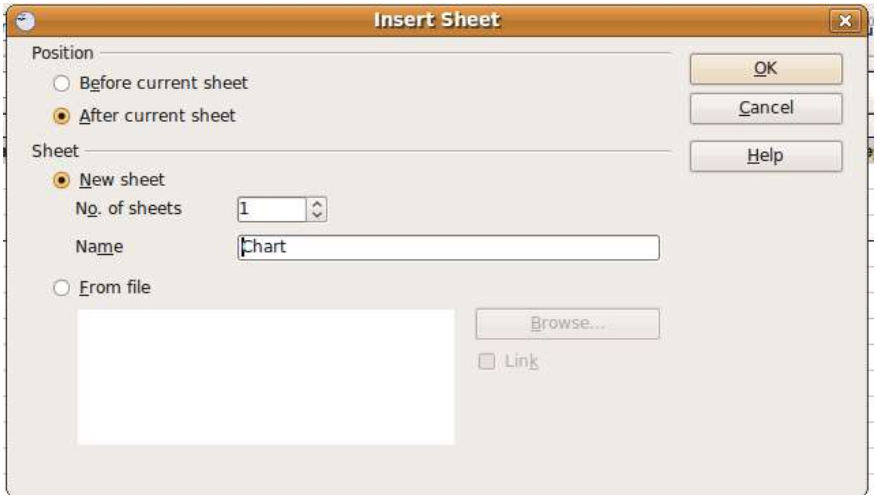
1. Select the worksheet you wish to rename by clicking on the tab forthat worksheet.
2. Choose **Format->Sheet->Rename** from the Calc menu..
3. Enter the new name in the dialogue.
4. Click **OK**.

Switch between worksheets

To switch between the different worksheets, you simply click on the tabof the worksheet you wish displayed.

Insert a new worksheet

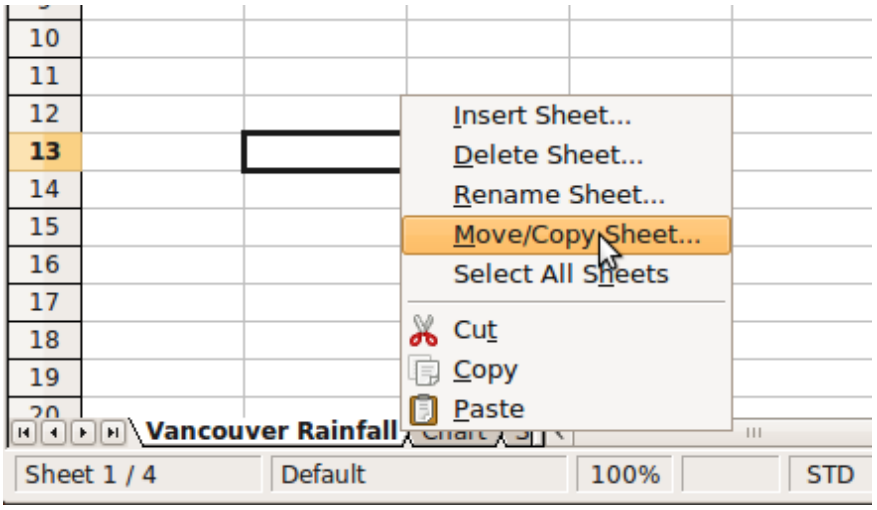
1. Click on the tab next to the location where you wish to insert thenew worksheet.
2. Click **Insert->Sheet**. This displays the **Insert worksheet dialogue**.



3. Choose the position before or after the selected sheet.
4. Choose the number of worksheets you wish to insert. If you chooseonly one sheet, you have the option to enter the name of that sheet in the **Name** window.
5. Click **OK**
6. Duplicate a worksheet

You may duplicate a worksheet either within the same spreadsheet or between spreadsheets. The other spreadsheet may be one that is alreadyopen or a new one to be created. In all cases, you will use the **Copy** command to carry out this task.

1. Right-click on the worksheet you wish to duplicate.
2. Choose **Edit->Move/Copy Sheet** from the context menu.



The **Move/Copy Sheet** dialogue box appears.

3. If you want to copy the worksheet to a new location, check the Copy checkbox. If you want to move the worksheet without makinga copy, leave it unchecked.
4. Select the document you want to move/copy the worksheet to. Thecurrent document is the default choice.
5. Select the position for the worksheet in the **Insert before** window.
6. Click **OK**.
7. Rename the duplicate worksheet if you wish

Delete a worksheet

1. Right click on the tab of the worksheet you wish to delete.
2. Select **Delete** in the menu that appears. A dialogue will appear asking you to confirm that you wish to permanently delete theworksheet and its contents.
3. Click **Yes** to confirm that you wish to delete the worksheet or **Cancel** if you do not wish to.

2.16 Printing a worksheet

Worksheet orientation

Worksheet orientation is a style that applies to the whole document. By default, when you create a new spreadsheet it is oriented in portrait mode.

You can edit the orientation of your document as follows:

1. Choose **Format->Page** from the Calc menu.
2. Click on the **Page tab**.

3. Select the size of paper you will be printing on. If you choose oneof the standard formats from the Format list, the paper size will be set automatically. You can also create a custom paper size by inputting values for the paper height and width.
4. Choose Portrait or Landscape for your document's orientation.
5. Set the margins to the desired width

Printing worksheets

The steps you have gone through prior to printing your document help toensure that your document is as polished and as correct as possible.

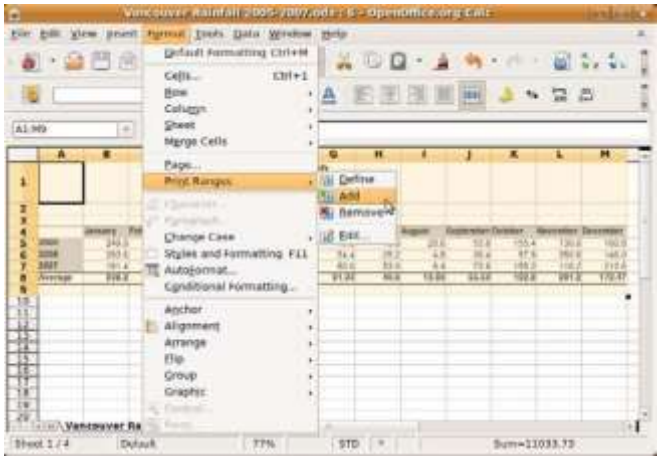
You are now almost ready to send your document to print. As a final step,you should preview what your document will look like when it's printed to make sure that pagination, margins, and formatting appear correctly.

To preview your document:

1. Choose **File->Page Preview** from the Calc menu.
2. Scroll through your document to view the pages as they will lookwhen printed.

Setting the print area

1. With your mouse, select the area of the worksheet you wantprinted.

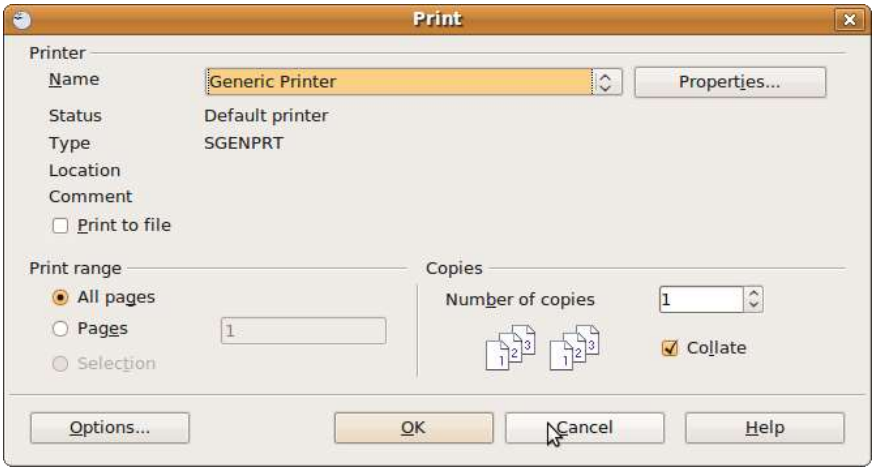


2. Choose **Format->Print Ranges->Add** to add your selection tothe print area.

Printing

To print your document:

1. Choose **File->Print** from the Calc menu.
3. Choose your printer and adjust the printer properties if necessary.Some printer properties are specific depending on the type of printer you are using. For example, you may need to set properties for your printer if you are printing in high quality colour.
4. Choose the pages you would like printed (by default the completedocument is printed).
5. Choose the number of copies you want to print (by default onecopy is printed).
6. Click on the **OK button** to print your document.


Print
Printer
Name
Generic Printer
Properties...
Status
Default printer
Type
SGENPRT
Location
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Print to file
Print range
All pages
Pages
1
Selection
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Number of copies
1
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OK
Cancel
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SEMESTER II

Course: Computer Applications in Accounting

UNIT 3: Computer and Computerised Accounting System

3.1 Introduction

As its terminology suggests, "computerized accounting" is accounting done with the help of a computer. It tends to includecommitted accounting software and digital spreadsheets to keep track of a business or client's financial transactions.

• Computerized accounting is advantageous inpresent advance technologies. Not onlyithas replacedthe old-style paper methods of accounting, but it has also produced new types of accounting applications for business. Businesses now makecomplete accounting information structures that incorporate all business operations, including external suppliers and vendors in the value chain.

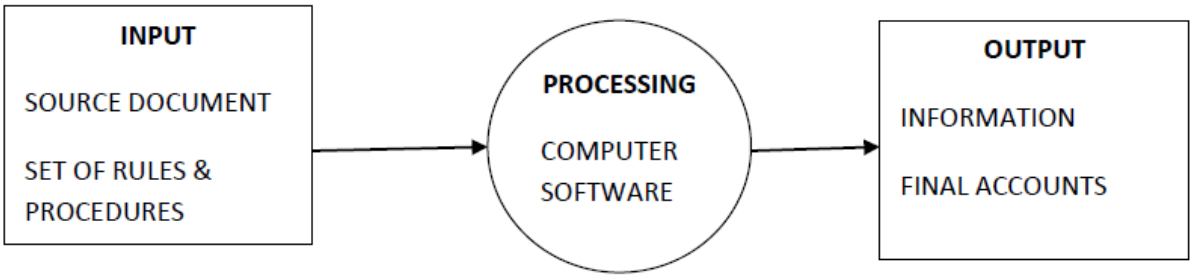
• Computerized accounting systems (or software) have provided a substitute against manual based accounting in almost all businesses and organizations, providing accountants, managers, employees and stakeholders access to fundamental accounting information at the

stroke of a button. Computerized accounting systems has mechanized the accounting process--improving efficiency and has help in reducing cost.

•Computerized accounting has number of benefits over traditional paper based accounting system. Computerized accounting tends to be more seamless, is faster to use, and is less prone to errors than the manual accounting system.

3.2 Setof Rules& Procedures

i. Input: The input source to computerized accounting system is the accounting data and vouchers, which is obtained from details of each transaction. Data is stem from source document and this is created as a result of occurrence of a transaction. This is kept as an evidence of transaction. Source document includes invoice, cheques received, expenses



vouchers and sales order forms etc. Inbuilt software e.g. sale invoice software is used for billing that becomes source documents and data is automatically entered and updated in to the system for further processing.

Another input to accounting system is set of accounting rules and processes which are coded in accounting software and that are run by inbuilt processes of computers, when transactions are processed by systems.

ii. Processing: The computerized accounting systems are designed in a manner that provide benefits of fast processing as the capability of modern day computers and soft wares are very robust. At this phase the accounting data is processed according to the basic accounting rules of double entry system of book keeping. The main feature here is that unlike manual accounting system the computerized accounting system are very fast and error free.

iii. Output: After the processing, the basic output of the computerized system is trading account, profit and loss account, and balance sheet. Now a day, the software is so advanced that produces additional reports like aging analysis of sundry debtors to manage these

account to check the status of the payments. Further reports like fund flow, cash flow statement and GST reports etc. can be generated in automation basis for legal compliances. Computerized accounting system generates these reports automatically and on user's request. These reports can be created as often as needed which is not available in manual accounting system method. The computerized accounting system is so versatile that they transfer output of one component of computerized accounting to another system as input. It facilitates data sharing in this accounting system with other interfaces.

3.3 Importance

Accounting system is the most important procedure of creating accounting information as the survival of the business depends on this. Computerized accounting system is the technique of generating accounting information for decision making at every level of management. This is possible due to robust computer systems along with the support of accounting packages (software). This system is very important and helpful to businesses.

a. **Automatic document production**: Number of reports can be generated promptly and with reliability. Reports like receipts, invoices, credit notes, sales order, purchase order, payroll documents, statement of comprehensive income and statement of financial position are generated spontaneously and processed automatically.
b. **Availability of information**: Financial information is promptly accessible to the users of accounting information for decision making at any time.
c. **Storage:** Storage of information is bound to happen in business for later on retrieval of the same. Computerized accounting system facilitates for storage of information. Information protected can also be repossessed whenever needs arise. It is very essential to take back up of your data and store it at some other place. The backup could be done by the use of flash drive, external back up and any other storage devices.
d. **Compatibility:** It makes easy for planning of merger and acquisition, where the companies involved use the same accounting software as the data synchronisation is possible without any hassles. Manual accounting system could be too difficult for the provision of accounting for merger and acquisition.

3.4 Advantages

Followings are the various advantages of computer based accounting**.**

a. Automation: As all the calculations are controlled by the accounting software, computerized accounting eliminates many of the routine and onerous processes associated with manual accounting. For instance, once issued, invoices are processed automatically making accounting less time-consuming.

b. Accuracy: The accounting system is designed in such a manner that it provides accuracies to the smallest detail. Once the dataflow into the system, all the calculations, including additions and subtractions, are done through inbuilt process automatically by the software. There is less space for error because only one account entry is needed for each transaction unlike repeated posting of the same accounting data in manual system.

c. Data Access: Through accounting software, it becomes much easier for different persons to access accounting data outside of the office, securely through internet. Further, data can be secured by application controls. This is predominantly true, if an online accounting solution is being used.

d. Reliability: As the calculations and controls are so accurate, the financial statements generated through computers are highly reliable. Computer systems are invulnerable to monotony, tiredness or fatigue. Hence, these can do repetitive jobs effectively and are extremely reliable as compared to human beings.

e. Scalable: When the size of the business grows, the data handling of accounting not only increases but develops more complexities. With the help of computerized accounting, the whole thing is kept easy because filtering via data using software is stress-free rather than examining through a bunch of papers.

f. Speed: By means of accounting software, the entire process of organizing accounts becomes faster. Furthermore, statements and reports can be prepared instantly at the hit off of a button. Administrators do not have to wait for long, as the reports can be generated on time for fast decisions. Computers need far less time as compared to the human beings in performance of a specific task. Consequently, accounting data is dealt within quicker mode using a computerized accounting system.

g. Security: The up-to-date data can be protected and stored at offsite sites, so it is safe not only from natural and man-made disasters like earthquakes, fires, floods, arson and terrorist attacks but from unauthorised access. In case of adversities, the computing system can be

swiftly restored on other computers by accessing to proxy servers. This protection is required by every organisation for solving the issues of denial of service.

h. Cost-effective: As using of computerized accounting is more effective than paper-based accounting, then obviously, processing of accounting information will be done faster and time will be saved. As the cost of accounting packages has been reduced considerably due to availability of number of accounting packages. The data can be stored in online mode in through cloud computing with less cost.

i. Visuals: The data processed through computerised accounting system will facilitate in generation of reports in different formats like graphics and in report form with relations. You can observe data in tables and using various types of charts. Computerized Accounting characterizes a technological development in the area of business accounting.

j. Up-to-date information: The accounting records are automatically updated and so every account balances (e.g. customer accounts) will always be up-to-date.

k. Availability of information: The processed accounting data is instantly accessible and can be made available to different end users at diverse places at the same time. This is called data sharing.

l. MIS Reports: MIS reports can be generated and that will help management to monitor and control the business affairs, for instance the aging analysis of debtors will depict the position of old debtors for noticing those customer accounts whose balance are overdue. Periodic reports for trial balance, trading and profit and loss account and balance sheet will help in finding the efficiency of the organisation. It is easier to monitor and control the business using the real time management information reports generated by the computerized information systems.

m. GST Returns: With the introduction of GST the necessities of the computerised accounting has been increased manifolds as number reports are required for e-filing of the returns at GST portal. The accounting data are so large which requires the supports of computerised system.

n. Efficiency: Computerised system based accounting improves the overall efficiency of the organisation as the financial data is updated in real time basis and supports earlier corrective

measures. The computer based accounting system confirms better use of time and human resources.

o. Staff motivation: The computerised accounting system will require workforce to be trained to use new skills, which can make them feel more motivated. As computing is a specialised skill which can be outsourced to outside agencies, which will motivate the staff as additional skills can be learnt that further enhances the operational skills of the staff.

3.5 Limitations

There are some limitations for buying the computerised accounting system.

i. Heavy Cost of Installation: Initial cost of installing computer hardware and software is quite large. Further staff needs training which is an additional cost. After installing new system, it needs replacement and updatation of software with updated one from time to time with the newer versions.

ii. Cost of Training: To ensure effective and efficient use of computerized system of accounting, the businesses are required to use newer versions of hardware and software. This needs specific training and cost is incurred to train the staff personnel as specialists. Sometime training is required from specialised persons having good experience in their respective fields which requires budget for the same.

iii. Unemployment: With the introduction of the computerised accounting system there is a chance of excess staff being laid off from their current positions. The staff worries about dismissal of their jobs and show less interest in computers.

iv. Disruption in Work: When computerized system is introduced, there might be interruption in current work due to data migration from manual system. There are also changes in work time and working environment.

v. System Failure: The danger of a system crashing due to any malfunction in hardware can lead to subsequent loss of work. This happens when no back-up is retained.

vi. Time Consuming: In order to prevent loss of work at the time of system failure, there is a need for keeping backup arrangements which is a time consuming process.

vii. Unanticipated Errors Not Known: Unlike human beings, computers do not have the competence to assess or find unexpected errors in the system.

viii. Breaches of Security: The risk of viruses and hacking into the system from outside intruders creates a robust need for security of system. Likewise, the person who has made the specific software package can easily take advantage of by tampering with the original records.

ix. Health Dangers: Extensive use of computers may lead to many health crises such as eyestrain, muscular complaints, backache etc. This will reduce the working efficiency as well as increase medical expenditure.

3.6 Differences between Manual and Computerized Accounting

a. Provision of financial statements: In manual accounting, the accountants require trial balance to prepare the periodical financial statement. First arithmetical accuracy of the trial balance is checked in manual system for proceeding further. But for computerized accounting soft ware these are done automatically and financial statements are effortlessly created by the software system itself.

b. Recording of the financial statements: Recording process needs calculating numerical functions by hand and putting them down in cash book or journals as well as posting them on ledger or books of original entry. But in computerized accounting software does the mathematical functions through internal data computation process as long as the right data information was punched into the software.

c. Rate of accounting computation: Computing the transactions in manual accounting is slower as it needs a stage by stage computation by use of human mind and hand. Computerized software accounting is much faster in processing the transactions as the software by design processes the data once it is fed.

d. Backup retrieval: For manual accounting recovering financial records might be tiring job and as it might include observing various paper documents for reference .Computerized software accounting effortlessly recovers the backup information as the accountants or business owners only have to restore the saved financial records to get the ones they need.

e. Ease of classifying accounting statements: For manual accounting, prior to ledger accounts posting and preparations, the transactions have to be recorded in the books of original entries like cashbook journal etc. However, in computerized accounting system, the accounting software categorizes the different transactions as per the accounting nature

defined in the software and financial statements are prepared automatically. The business owners or accountants can just consolidate financial statements as they require at any point of time.

f. Accuracy of Financial Records: For manual accounting records to be precise, the accountants and business owners have to be very cautious and extremely proficient to compile the financial reports accurately. Bur with the computerized accounting, as long as accurate data are punched then rest of the tasks are done by the software programs. In this way accurate and reliable financial statements will be prepared.

g. Review of the records: Manual accounting financial records can be used effortlessly for review. The rectifications and modifications can also be easily made. However, in computerized software accounting, the review of financial statements is also fast, but the knowledge of its working out can be achieved by cautiously examining the financial formula.

h. Speed: Computerized accounting produces information extremely quicker than manual accounting. Accounting software packages, such as Tally, Busy win and QuickBooks come with built-in databases that allow users to input data.

i. Financial Statements: In a manual accounting system, one has to make company's income statement, balance sheet and statement of owner's equity manually. Figures from the journal entries helps in formulating the company's financial statements. But the computerized accounting systems let financial statements to be produced from information stored in the database.

j. Cost: The budget of computerized accounting systems can vary from few thousands of rupees to lakhs of rupees for large businesses. A computerized accounting system may save on man hours with the robust speeds in compiling financial records and reports. For this object, many small and mid-sized businesses are using computerized accounting software.

k. Reports: Accounts are created in an appropriate way when using a computerized accounting system. Reports produced from electronic accounting software permit managers to run the business in a more efficient and effective manner. Generating reports in a manual accounting system may lead to more time, staff frustration due to manual operations and this will result in having to work with outdated information.

l. Safety: Accounting records kept on the manual system can be lost or spoiled easily. On the other hand, records kept in a computer are expected to be safer as accounting backup is available for any unforeseen events. If anyone has lost the pages in a paper pad, then that person may have to reconstruct the transactions by doing investigation and writing them in again. In a computerized system, one can simply restore the latest backup file and add a few transactions that were not saved. In this space, accounting software is excellent to manual systems.

m. Properly Organized: Data processed via accounting software is organized and easy to find. That's not possible with manual systems, where one has to analysis several pages to find what is needed. For example, if the report in regard to the old stock is needed then same can be found with a click of a button by going to inventory management section in the accounting software. If the same process is done on a manual system, one has to go through several pages and which is a time consuming job.

n. Significance: Information technology plays a vital role in accounting processes because it improves financial reporting techniques and generate errors free financial statements.

o. Time Frame: Computerized accounting activities assist an accountant to do month-end close procedures to judge the operational; efficiency. These actions also help business to report profit information over a period, such as a month or quarter

3.7 Features of accounting packages

i. **Reporting and analysis**: Data is strength in today's demanding business atmosphere. Therefore, any accounting package one selects for evaluation must have robust reporting and analysis competences. Also managers get insight into critical financial events, reporting and analysis functions that help businesses to follow the rules and regulations framed by the government and industry.

ii. **Graphics:** Accounting is mainly a numbers driven activity. Yet graphics, in the form of diagrams and other descriptive presentations, is a great tool that can be used to exhibit trends for studying past performances and doing forecasting. This will depict the numbers and other concepts in easiest way that numbers alone can't express.

iii. **Automation:** For lots of companies, provision for simple accounting transactions and basic financial management tasks are not adequate. Many businesses need the complete

computerization of worker expenses, payrolls and time sheets; company and departmental budgets; purchase requisitions and other complicated financial activities.

iv. **Automatic updates**: Taxation laws, rules and financial practices vary over time, so it's important to use accounting software that can be updated on time with necessary changes.

v. **Customization**: There are possibilities that no accounting software will precisely correspond to the business's needs. In that case the businesses should explore for a software packages that allows the easy customization to become user friendly.

vi. **Internet connectivity**: As entire world is moving to the Internet, it's only rational that accounting software should go along with the masses. Therefore, it is necessary that accounting software which has the capability to send and receive digital records and handle electronic fund transfers should be considered.

vii. Inter-operability: The information entered into the accounting software package can be effectively utilised by various business applications like in HR, sales, shipping and other key business segments. Accounting programs should be selected keeping in view the ability to interoperate with other software's before deciding on whether to purchase it.

viii**. Scalability**: When the business is in the growth phase in the years to come. Accounting software should be able to keep the pace with the growth .Companies should look for a accounting software that adapts, or can be effortlessly updated to accommodate the fast growth. The system should be supportive to a progressively larger number of users and increasing amount of financial data and transactions. Comprehensive discussions with the vendors should be done for scalability of the product in the growth phase.

ix. **Security:** Business mainly depends on the vital information generated through its accounting software for its very survival and decision making. If data is lost, compromised or manipulated the management will make wrong decisions which stand to lose time, money, business secrets (such as sales or profit data). Data security is of great importance, hence, software should be tested beforehand and it’s synchronisations with the current accounting system should be ensured. All the built in security controls should be tested as claimed by the vendors and necessary changes should be done.

x. **Reporting**: Moreover, apart from the range of diverse attributes that are accessible in accounting software, the quality and quantity of reports the system can create differs

extensively. Various systems present a huge variety of reporting alternatives, with almost unlimited classifications and reporting options. Others just offer the basic reports: money in and money out. Here are some of the better options like Standard reports, Customizable reports, Graph summaries, Cost predictions

xi. **Inventory**: An accounting system with stock and inventory in built controls can really make more efficient business reporting and controls, helping to identify current stock position like slow moving stocks and obsolete stock. This will help in taking appropriate remedial measures to liquidate the stock which cannot be sold. Some of the reports are like Track inventory status, set inventory levels, specify stock locations, Include item images.

3.8 Points to be considered before sourcing of accounting software

Accounting software is an essential part of the computerised accounting system. An imperative aspect to be deliberated before purchasing accounting software is the accounting proficiency of persons in charge in organisation for accounting function. Individuals, not PCs, are responsible for accounting. The necessity for accounting software arises in two conditions:

(a) when the computerised accounting system is put into operation to replace the manual system or

(b) when the existing computerised system needs to be interchanged with a new one in view of changing needs.

3.9 Types of Accounting Packages

Every Computerised Accounting System is put into action for performing accounting activities (recording and storing of accounting data) and produce reports as per the requirements of the different users.

From this perspective. The accounting packages are categorized into the following classes:

(a) Ready to use

(b) Customised

(c) Tailored

Each of these classes offers distinctive characteristics. However, the choice of the accounting software would depend upon the suitability to the organisation especially in terms of accounting needs.

a. **Ready-to-Use** accounting software is appropriate for the businesses running small/conventional business, where the occurrence or size of accounting transactions is very low. This is because the cost of installation is normally low and number of

users is limited. Ready-to-use software is comparatively simpler to learn and people (accountant) adaptability is very high. This also indicates that intensity of secrecy is comparatively low and the software is susceptible to data frauds. The training requirements are minimal and sometimes the vendor (supplier of software)offers the training on the software free. However, this types of software presents little scope of networking to other information systems and often require replacements with other accounting soft wares when the volume of transactions is increased.

b. Customised

Accounting software may be customised to meet the specific requirement of the user. Standardised accounting software or packaged accounting software available in the market may not match or live up to the user requirements. For instance, standardised accounting software may comprise of the sales voucher and stock status as distinct options. However, when the financial data is so large which requires that inventory status to be updated instantly upon entry of sales voucher and report be printed, the software needs to be customised. Customised software is suitable for large and medium scale business enterprises and can be used as interface to the other information systems. The cost of setting up the software and maintenance is relatively high because the high cost is to be paid to the vendor for customisation. The customisation contains adaptation and addition to the software contents, provision for the specified number of users and their authentication, etc. Confidentiality of data and software can be better maintained in customised software by application controls and limiting user access. As there is a need to train the employees for using the software, the training costs are consequently high.

c. Tailored

Tailored made accounting software is normally used in large business organisations with multi users and geographically scattered locations. These software necessitates specialised training to the users. Software like ERP solutions used in the MNC are fit in this type of category. Software used by the FMCG companies are quite different from the software used by the Banking Companies for accounting applications. The tailored software is designed to meet the specific requirements of the users and work as back bone of the organisation's accounting applications and generating MIS reports. The confidentiality and authenticity checks are tough in such soft wares and they offer high flexibility in terms of number of users. These software work on the concept of need to know need to do basis.

3.10 General consideration before sourcing accounting software

The under mentioned factors are usually taken into considerations before sourcingan accounting software.

i. **Flexibility:** An essential contemplation before purchasing an accounting software is flexibility, viz. ease of data entry, processing and the availability of different reports as expected from it. Also, it should offer some flexibility between the users of the software, the switch over between the accountants (users), operating systems and the hardware. The user should be able to run the software on variety of platforms and machines, e.g. Windows 98/2000, Linux, etc.

ii. **Cost of Installation and Maintenance:** The selection of the accounting software apparently requires the willingness of organisation to invest huge amount in buying the hardware and software. A clear-cut standard to take such a decision is the cost benefit analysis of the available options vis a vis the financial and operational gains from the desired software to be installed. Sometimes, a number of software which looks cheap to buy, entail heavy maintenance and modification costs, e.g. cost of addition of modules, training of staff, updating of versions, data failure/restoring costs and annual maintenance charges. On the other hand, the accounting soft ware which appear primarily expensive to the buyers initially, may require minimum maintenance and free upgrading and negligible alteration costs.

iii. **Size of Organisation:** The size of organisation and the volume of business transactions do affect the software selections. Small organisations, e.g. in non-profit organisations, small trading concerns, where the volume of accounting transactions is not so large, may select a simple, single user operated software. For instance, Tally accounting software is available with facility of single user and multiuser application feature. While, a big business concern may require high-level software to meet the multi-user requirements, geographicallyscattered and connected through complex networks.

iv. **Ease of adaptation and training needs**: A number of accounting software is user friendly demanding a simple training to the users. However, some other complex software packages connected to other information systems require rigorous training on a regular basis. The software must be capable of appealing users and, if its necessitates simple training, should be able to motivate its potential users.

v. **Utilities/MIS Reports**: The MIS reports and the extent to which they are used in the organisation also decide the procurement of software. For instance, software that necessitates merely generating the final accounts or cash flow/ratio analysis can have ready to-use software. On the other hand, the software, which is supposed to deliver cost records or other sophisticated reports for decision making needs to be customised as per user requirements.

vi. **Expected Level of Secrecy (Software and Data)**: Another attention before procurement of the accounting software is the inbuilt security features ,which check unauthorised peoples from retrieving and/or manipulating the vital data in the accounting system. In tailored software for large companies, the user privileges may be limited to purchase vouchers for the purchase departments, ales vouchers to the billing accountants and petty cash module access with the cashier. These are called application controls. The operating system also be of importance. Unix environment allows multi-users compared to Windows. In Unix, the user cannot access the computer system for doing the work unless the user clicks with a password, which is not a check in Windows.

vii. **Exporting/Importing Data Facility**: The transmission of data files to other systems or software is needed from time to time from the accounting software. Organisations may want to transport data directly from the ledger into spreadsheet software such as Lotus or Excel for more flexible reporting. The software should allow the import or export of the data in to excel sheets or spreadsheets without any data manipulations. Accounting software may be needed to be connected to MIS software in the organisation for reporting. In some ready to use accounting software's, the exporting, importing capability is available but is limited to MS Office modules only, e.g. MS Word, MS Excel, etc. However, tailored software's are configured in such a way that they can work together and share information with the numerous sub components of the organisational MIS.

viii. **Vendors Reputation and Capability**: Additional significant matter is the reputation and competence of the vendor. This is contingent upon how long the vendor has been in the business of software development. External reports about the vendor from the businesses using his software is of great importance. Evaluation of these reports of other users of the software and extent of the availability of after sale support is very much important for selection of the accounting software.

3.11 Let Sum Up

Computerized accounting" is accounting done with the help of a computer. It tends to include committed accounting software and digital spreadsheets to keep track of a business or client's financial transactions. Accounting information from the vouchers are used as input for processing and desired reports are generated. The importance of the computerized accounting system is manifold as this is the technique used for generating accounting information for decision making at every level of management. This system offers number of advantages like automation, accuracy, data access, reliability, speed, security, cost effective, MIS reports, efficiency etc**.** However, there are some limitations like heavy cost of installation, cost of training, unemployment, disruption in work, time consuming, breaches of security and health dangers. There are different advantages of using computerized accounting system over manual accounting system. The accounting packages are categorized into the classes like (a) Ready to use, (b) Customised and (c) Tailored. There is certain general consideration to be noted before sourcing an accounting software like Flexibility, Cost of Installation and Maintenance, Size of Organisation, Ease of adaptation and training needs, Utilities/MIS Reports, Expected Level of Secrecy (Software and Data), Exporting/Importing Data Facility and Vendors Reputation and Capability

3.12 Test your knowledge.

Questions

1. Define a computerised accounting system.
2. Distinguish between a manual and computerised accounting system.
3. What is computerized Accounting?
4. Discuss the limitations of computerized Accounting.
5. What are rules and procedures involved in computerised accounting?
6. What are the advantages of computerised accounting?
7. What are the features to be studied before selecting an accounting software?
8. Explain the different categories of the accounting packages available in the market.
9. What points to be considered before buying an accounting software.

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SEMESTER-II

COMPUTER APPLICATIONS IN ACCOUNTING

(MCMM21201T)

Unit 4 – Electronics Spread sheets: Excel

STRUCTURE

4.1.1 OBJECTIVES

After studying the Unit, students will be able to

- ✓ Understand the basic concepts of business storage data.
- ✓ Understand how to work with button on the tool bar.
- ✓ Entering the data in to the worksheet.
- ✓ Understand and apply Cut, Copy, Paste, text and formula.
- ✓ Understand the basic terminology used in Excel.

4.1.2 Introduction

MS-Excel is a full-featured window based spread sheet program developed by Microsoft Corporation is used by millions of people around the world. Excel includes all standard features of a spreadsheet package like automatic recalculation, graphs & functions. It includes several advanced utilities like facility to include other objects within a spreadsheet, table and form designing.

Microsoft Excel is developed on the GUI concept. A spreadsheet is a highly interactive computer program that consists of a collection of rows and columns that are displayed on the screen in a scrollable window. The intersection of each row and column is called a cell. A cell can hold a number, a text string or a formula that performs a calculation using one or other cells.

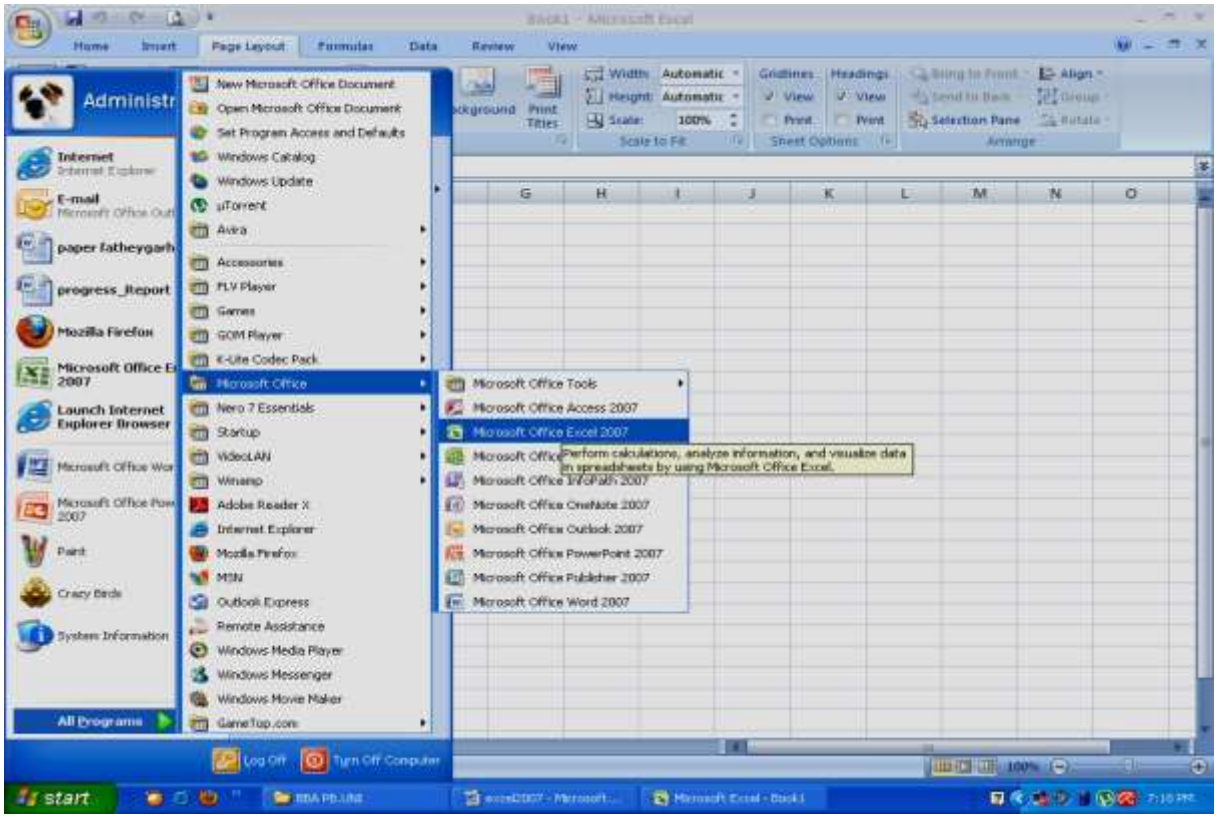
This chapter gives an introduction to spread sheets. It also highlights the new features of MS- Excel, the concept of a workbook and adding or deleting rows and columns.

The most important advantage of using an electronic spreadsheet is that formulas recalculate their results if changes are made to the contents of the related cells.

Excel is used for a variety of applications. It is commonly used to automatic financial statements, business forecasts, transition registers inventory control, accounts receivable and accounts payable. The package provides statistical, analytical and scientific functions. Therefore, Excel is used in many scientific and engineering environments to analyze numerical data and present findings. Excel comes across as a powerful and flexible graphical presentation tool. Excel is also able to access data stored in database formats. Excel may also used as a powerful application development tool.

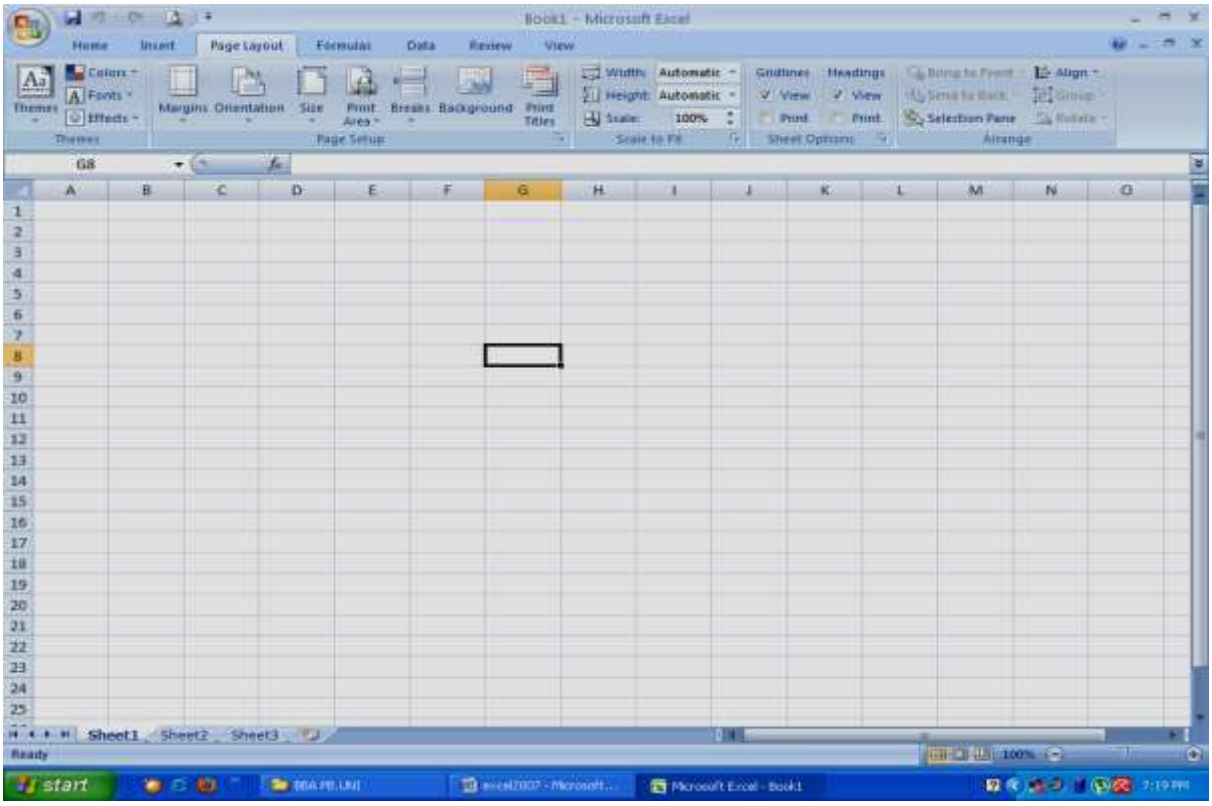
4.1.3 STARTING EXCEL

1. Click the start button on the task bar.
2. Point to program.



Fig

3. Click Microsoft Excel. A blank workbook opens, and the new workbook task pane opens on the right side of the screen.



4.1.4 EXCEL APPLICATION WINDOW

The excel application window includes the standard title bar and command bars. Below the command bars is a strip that contains the name box and the formula bar.

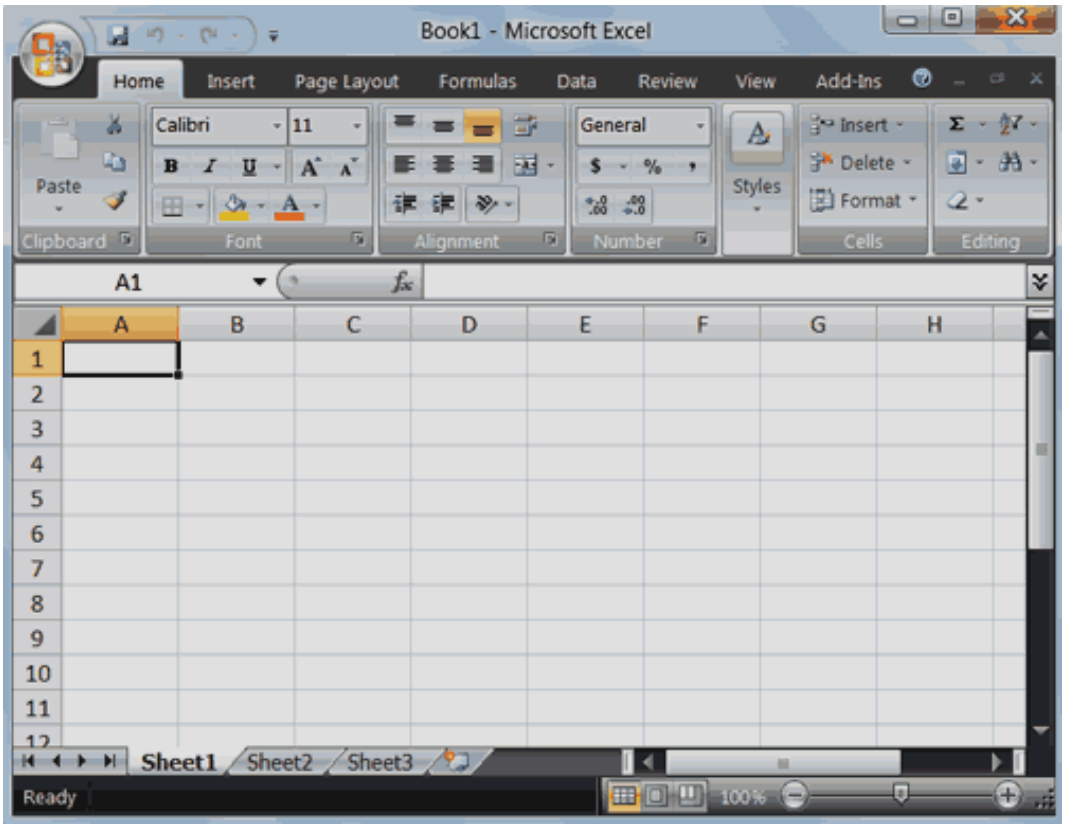
The excel status bar displays information about current selection, commands or operations. The right end of the status bar displays NUM if the keyboard's num lock is on.

MS-Excel uses personal tool bar, so the command bars may appear side by side or one above the other you can drag and drop command bars to rearrange them you if wish you can also click the tool bar and drag it to the left to along at its display and make more buttons visible.

4.1.4.1 Components of Excel Application Window

Microsoft Excel is an electronic spreadsheet. You can use it to organize your data into rows and columns. You can also use it to perform mathematical calculations quickly. Although knowledge of how to navigate in a Windows environment is helpful.

This chapter will introduce you to the Excel window. You use the window to interact with Excel. To begin this chapter, start Microsoft Excel 2007. The Microsoft Excel window appears and your screen looks similar to the one shown here.



Fig

Note: Your screen will probably not look exactly like the screen shown. In Excel 2007, how a window displays depends on the size of your window, the size of your monitor, and the resolution to which your monitor is set. Resolution determines how much information your computer monitor can display. If you use a low resolution, less information fits on your screen, but the size of your text and images are larger. If you use a high resolution, more information fits on your screen, but the size of the text and images are smaller. Also, settings in Excel 2007, Windows Vista, and Windows XP allow you to change the color and style of your windows.

4.1.5 Anatomy of Excel Worksheet

The structure of worksheet of MS-Excel from top to bottom with icons are as below

1.The Microsoft Office Button

Fig

In the upper-left corner of the Excel 2007 window is the Microsoft Office button. When you click the button, a menu appears. You can use the menu to

create a new file, open an existing file, save a file, and perform many other tasks.

2.The Quick Access Toolbar

Fig

Next to the Microsoft Office button is the Quick Access toolbar. The Quick Access toolbar gives you with access to commands you frequently use. By default, Save, Undo, and Redo appear on the Quick Access toolbar. You can use Save to save your file, Undo to roll back an action you have taken, and Redo to reapply an action you have rolled back.

3. The Title Bar

Fig

Next to the Quick Access toolbar is the Title bar. On the Title bar, Microsoft Excel displays the name of workbook you are currently using. At the top of the Excel window, you should see "Microsoft Excel - Book1" or a similar name.

4.The Ribbon

Fig

- You use commands to tell Microsoft Excel what to do. In Microsoft Excel 2007, you use the Ribbon to issue commands.
- The Ribbon is located near the top of the Excel window, below the Quick Access toolbar.
- At the top of the Ribbon are several tabs; clicking a tab displays several related command group Within each group are related command buttons.
- You click buttons to issue commands or to access menus and dialog boxes.

- You may also find a dialog box launcher in the bottom-right corner of a group.
- When you click the dialog box launcher, a dialog box makes additional commands available.

5. Formula Bar

Fig

Formula Bar

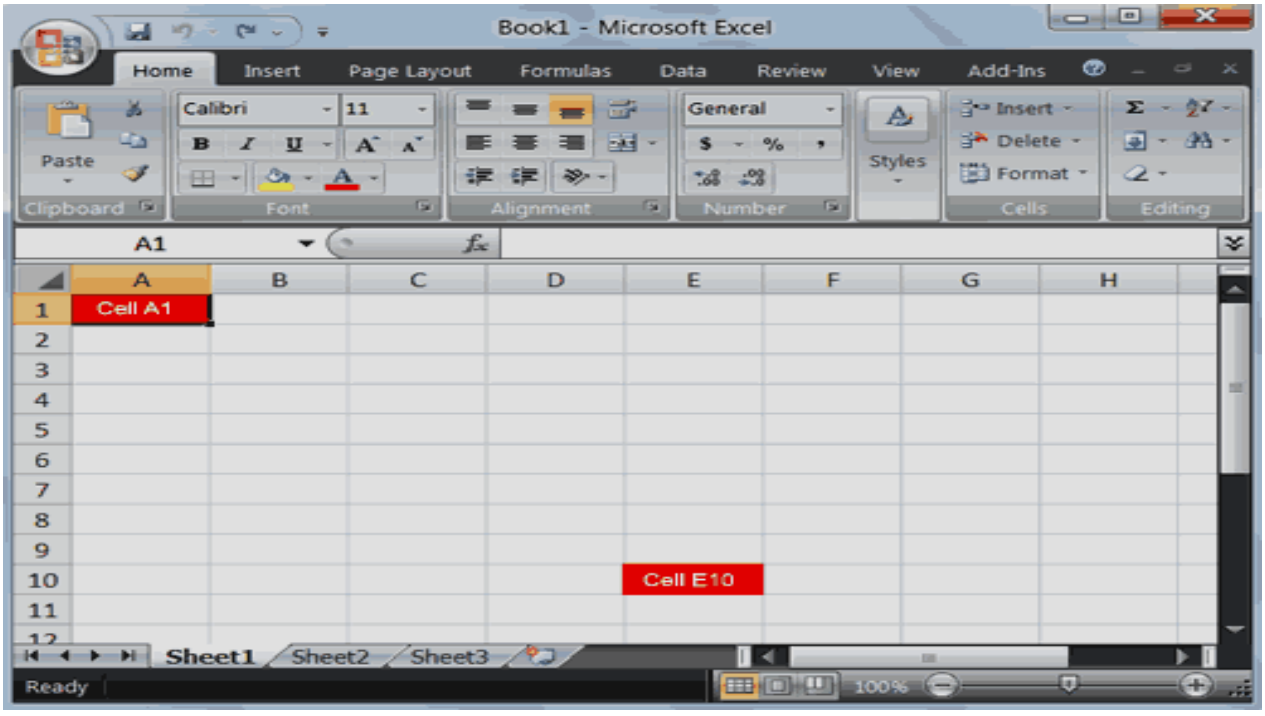
- If the Formula bar is turned on, the cell address of the cell you are in displays in the Name box which is located on the left side of the Formula bar.
- Cell entries display on the right side of the Formula bar.

If you do not see the Formula bar in your window, perform the following steps:

1. Choose the View tab.
2. Click Formula Bar in the Show/Hide group. The Formula bar appears.

Note: The current cell address displays on the left side of the Formula bar.

6. Worksheets

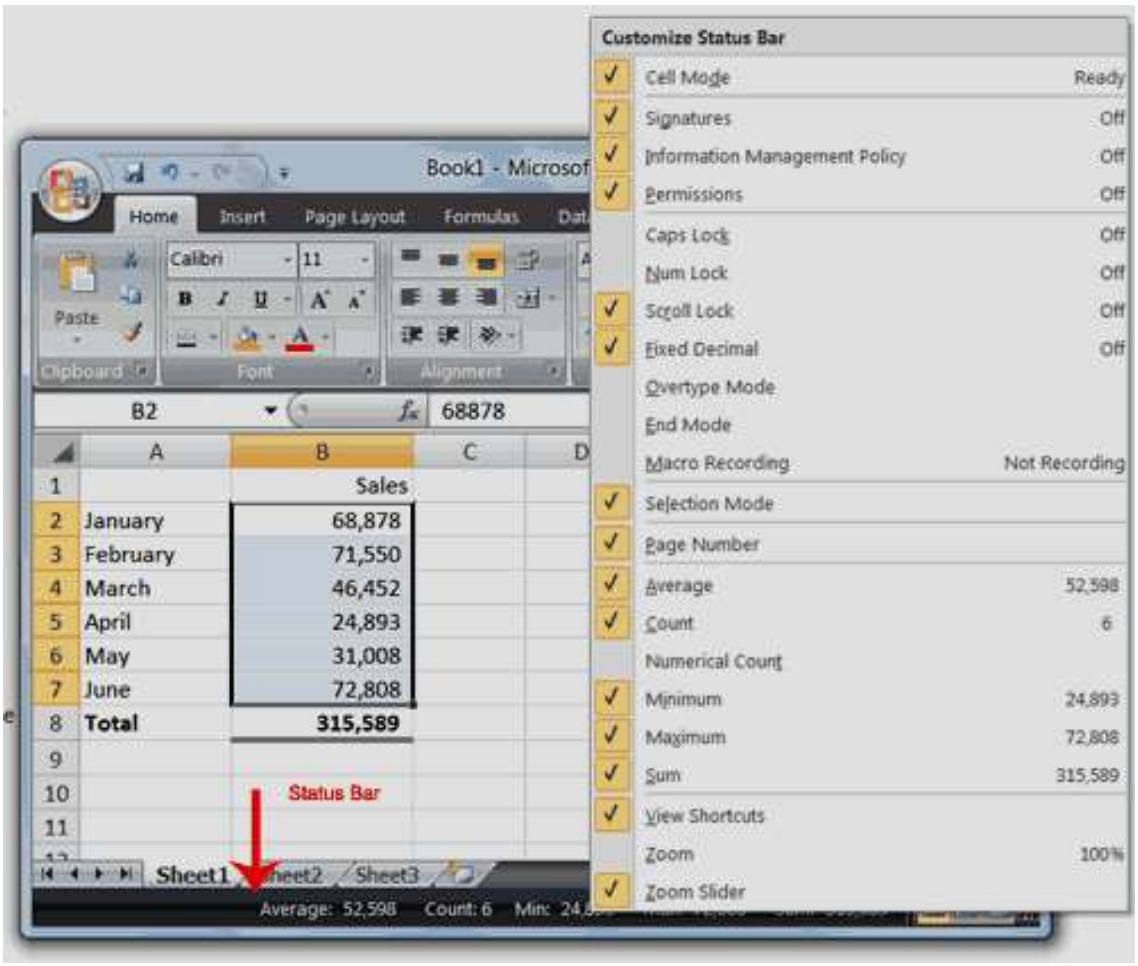


Fig

- Microsoft Excel consists of worksheets.
- Each worksheet contains columns and rows.

- The columns are lettered A to Z and then continuing with AA, AB, AC and so on;
- The rows are numbered 1 to 1,048,576.
- The number of columns and rows you can have in a worksheet is limited by your computer memory and your system resources.
- The combination of a column coordinate and a row coordinate make up a cell address.
- For example, the cell located in the upper-left corner of the worksheet is cell A1, meaning column A, row 1. Cell E10 is located under column E on row 10. You enter your data into the cells on the worksheet.

7. Status Bar



Fig

- The Status bar appears at the very bottom of the Excel window and provides such information as the sum, average, minimum, and maximum value of selected numbers.

- You can change what displays on the Status bar by right-clicking on the Status bar and selecting the options you want from the Customize Status Bar menu.
- You click a menu item to select it.
- You click it again to deselect it.
- A check mark next to an item means the item is selected.

8. Move around Worksheet

- By using the arrow keys, you can move around your worksheet.
- You can use the down arrow key to move downward one cell at a time.
- You can use the up arrow key to move upward one cell at a time.
- You can use the Tab key to move across the page to the right, one cell at a time. You can hold down the Shift key and then press the Tab key to move to the left, one cell at a time.
- You can use the right and left arrow keys to move right or left one cell at a time.
- The Page Up and Page Down keys move up and down one page at a time.
- If you hold down the Ctrl key and then press the Home key, you move to the beginning of the worksheet.

9. Working with Excel Worksheet

Move around the Worksheet

a. The Down Arrow Key

Press the down arrow key several times. Note that the cursor moves downward one cell at a time.

b. The Up Arrow Key

Press the up arrow key several times. Note that the cursor moves upward one cell at a time.

c. The Tab Key

1. Move to cell A1.
2. Press the Tab key several times. Note that the cursor moves to the right one cell at a time.

c. The Shift+Tab Keys

Hold down the Shift key and then press Tab. Note that the cursor moves to the left one cell at a time.

d. The Right and Left Arrow Keys

1. Press the right arrow key several times. Note that the cursor moves to the

right.

2. Press the left arrow key several times. Note that the cursor moves to the left.

e. Page Up and Page Down

1. Press the Page Down key. Note that the cursor moves down one page.
2. Press the Page Up key. Note that the cursor moves up one page.

f. *The Ctrl-Home Key*

1. Move the cursor to column J.
2. Stay in column J and move the cursor to row 20.
3. Hold down the Ctrl key while you press the Home key. Excel moves to cell A1.

10. Go To Cells Quickly

The following are shortcuts for moving quickly from one cell in a worksheet to a cell in a different part of the worksheet.

Go to -- F5

The F5 function key is the "Go To" key. If you press the F5 key, you are prompted for the cell to which you wish to go. Enter the cell address, and the cursor jumps to that cell.

1. Press F5. The Go To dialog box opens.
2. Type **J3** in the Reference field.
3. Press Enter. Excel moves to cell J3.

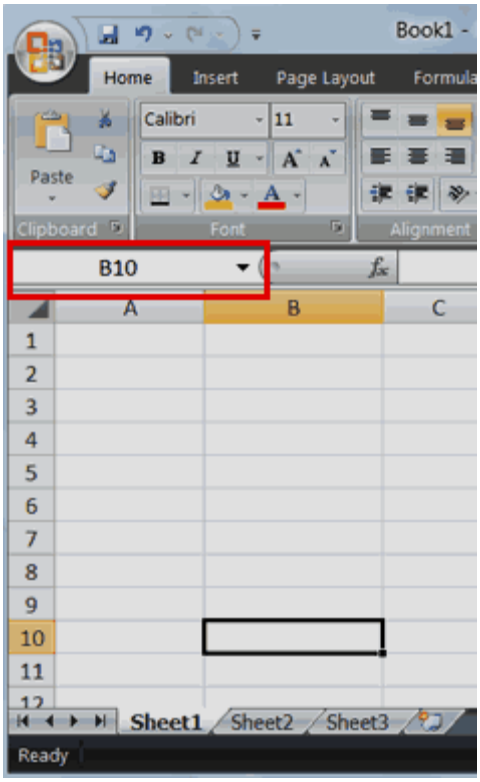
Go to -- Ctrl+G

You can also use Ctrl+G to go to a specific cell.

1. Hold down the Ctrl key while you press "g" (Ctrl+g). The Go To dialog box opens.
2. Type **C4** in the Reference field.
3. Press Enter. Excel moves to cell C4.

11. The Name Box

You can also use the Name box to go to a specific cell. Just type the cell you want to go to in the Name box and then press Enter.



Fig

1. Type **B10** in the Name box.
2. Press Enter. Excel moves to cell B10.

4.1.6 EXCEL FEATURES

Excel support a variety of features that are helpful for managing the spreadsheet data.

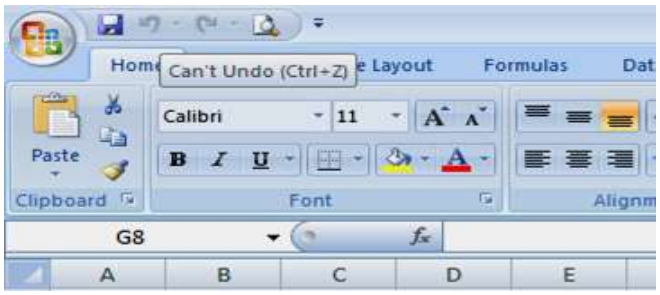
A few important features of excel are:

1. Excel has 1048576 rows and 16384 columns in it worksheet.
2. It support what if analysis to help predict the future values if there is a change in the cell content which is referred to in the formula.
3. Based on the data, graphs or charts can be created for quick assessment of a situation.
4. Excel provide facility of manipulation of string data.
5. Excel support date and time related function.
6. Huge amount of information stored.
7. Excel takes advantage of windows environment. The windows environment especially applies to DDE (Dynamic Data Exchange) and OLE (Object Linking and Embedding) concept within Excel and between Excel and other windows application.
8. Excel also has a drawing tool bar by using which you create your own graphs, charts and other pictures.

9. You can create shortcut keys for processing the task automatically by using the keyboard macros.
10. Excel allow you to define macros, which you can use to combine a series of actions to automate your work.
11. The new share workbook feature lets multiple users open a workbook on network and edit it simultaneously.
12. Solver add-in-enables you to calculate the values needed to reach a particular result by adjusting the values of one or more cells.

4.1.7 UNDO AND REDO

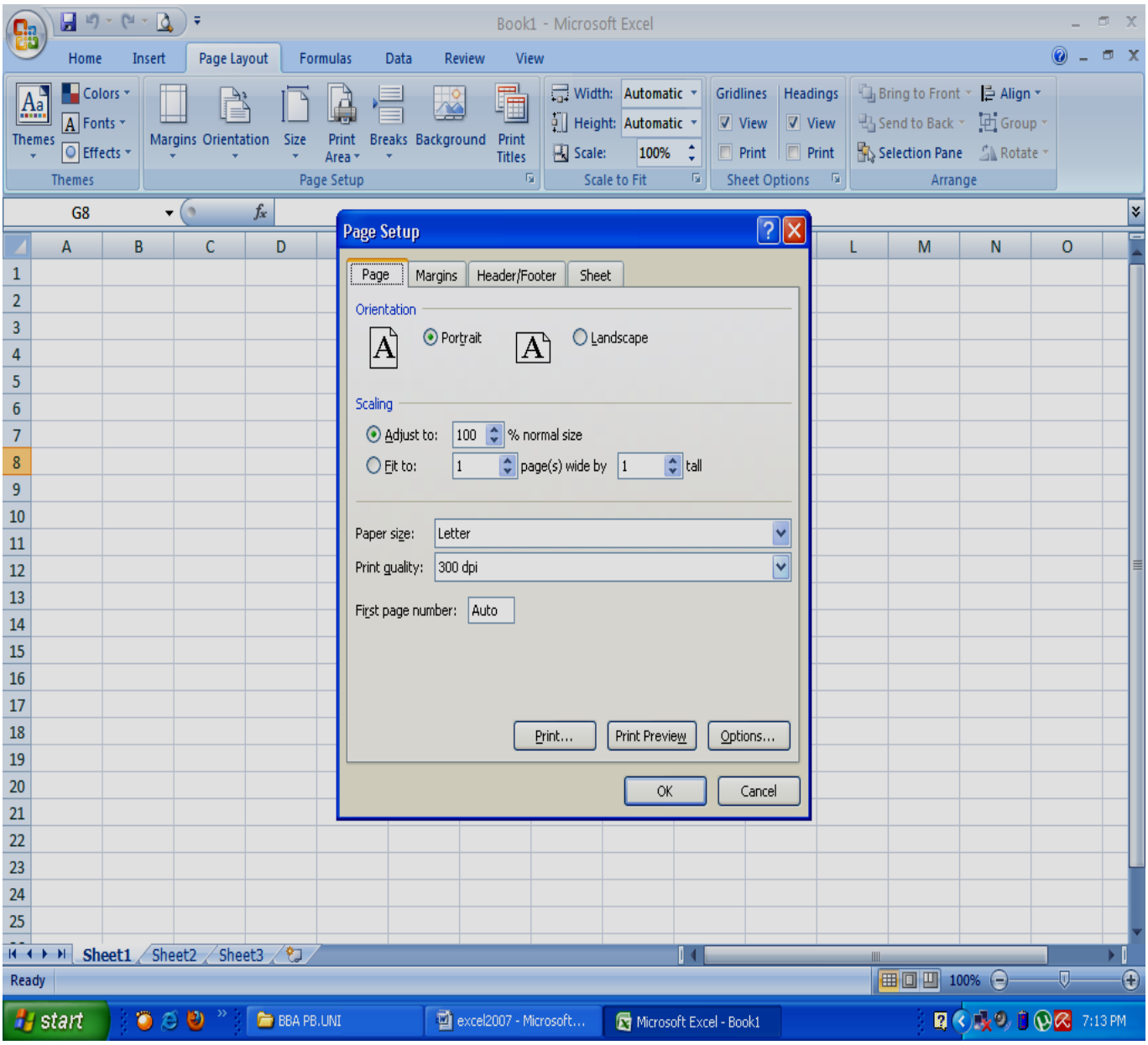
MS-Excel allows many commands or actions or operations to be reversed or roll back i.e. an action can be undone by selecting the undo option from Home Tab or by pressing the Ctrl+Z key combination from the keyboard. It can deselect or undo previous action or operations. The undo option can be selected by clicking the undo button having anti clockwise arrow on the standard toolbar. Excel also provides a command to repeat the last action by selecting redo option from the Home Tab or by pressing the Ctrl+Y key combination as shortcut key.



Fig

4.1.8 PRINTING

This section describe the printing process of MS-Excel. MS-Excel provides a number of option to improve the appearance of printouts of worksheets and charts. The Office button has four options related to printing. These are Page Setup, Print Area, Print Preview and Print. These are explained as under :

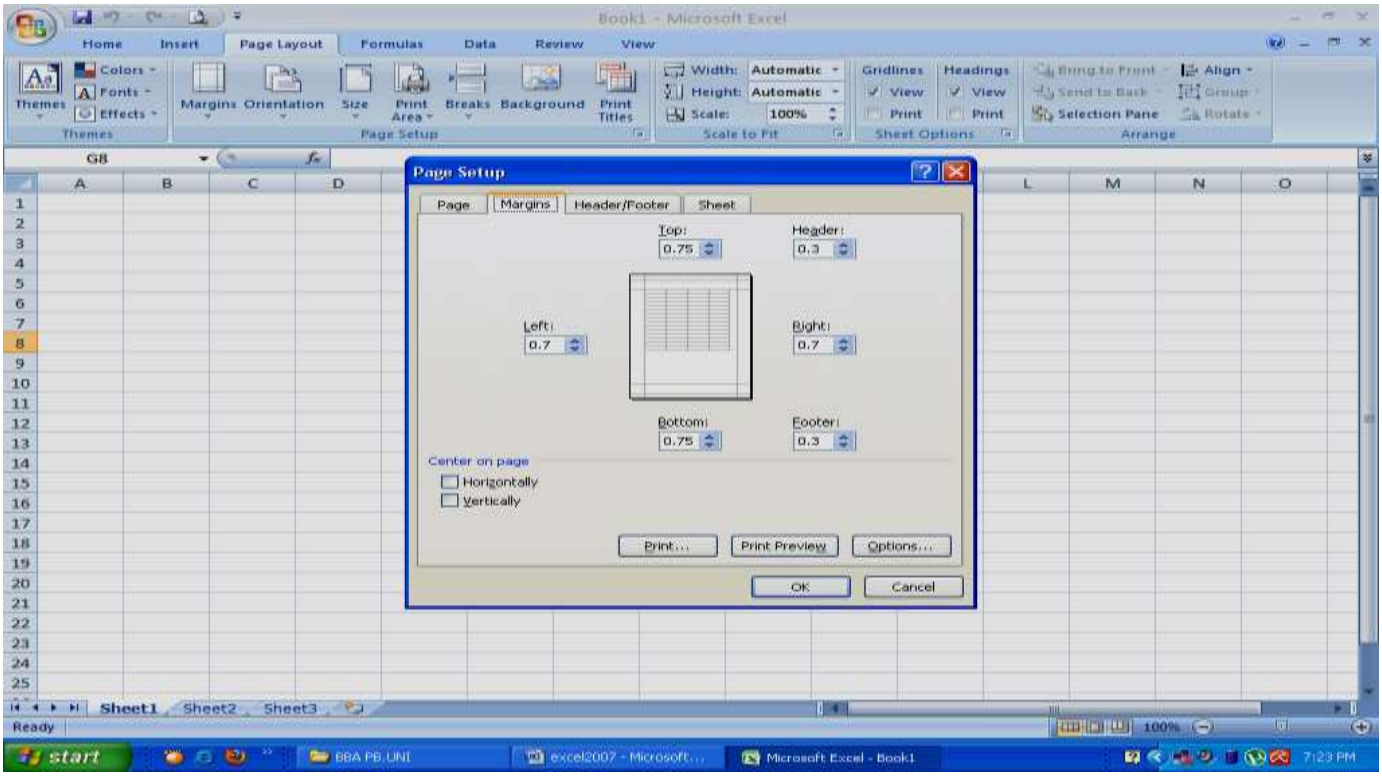


Fig

Page Set Up :- Page Setup displays a four-part dialog that is used to lay out your page. Click the appropriate tab to display the corresponding dialog.

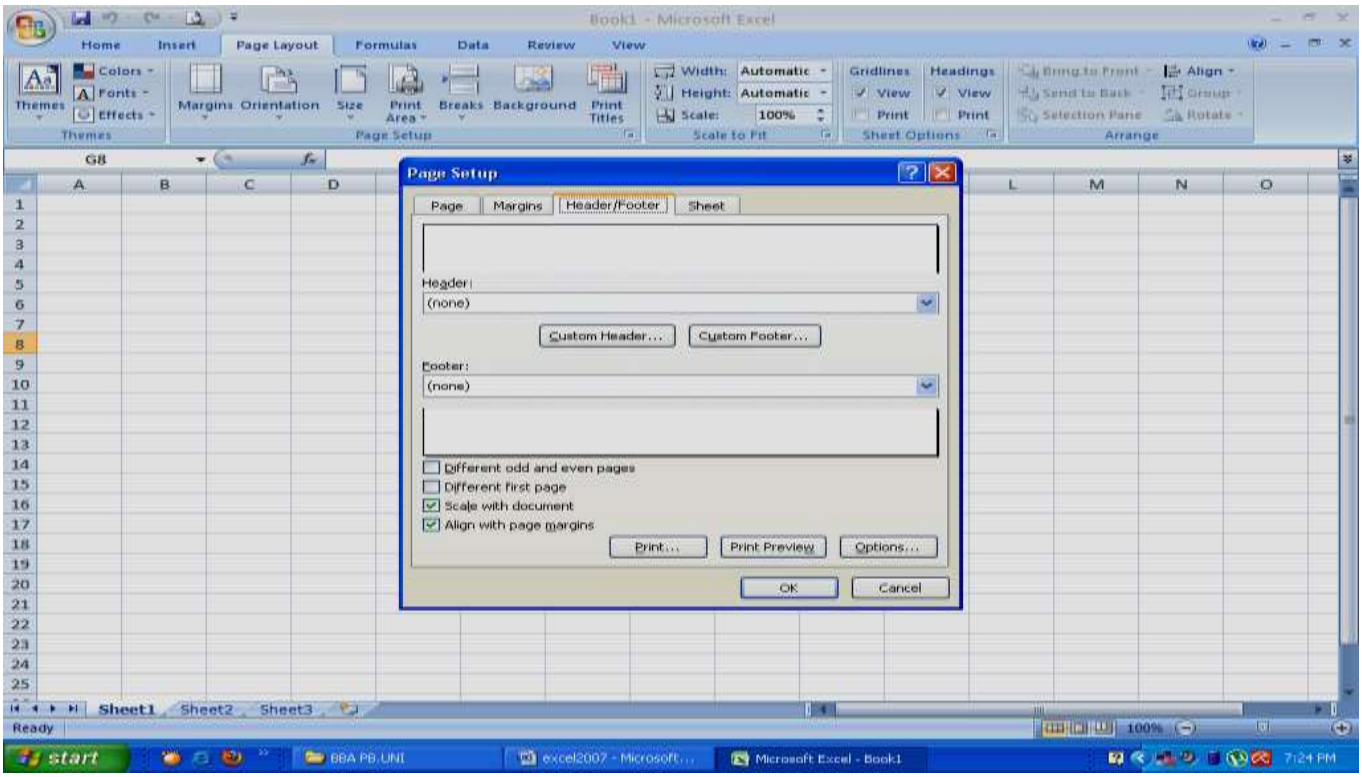
Page :- This dialog box is used to set page orientation, scaling, and paper size.

Margins :- This dialog box is used to set the left, right, top and bottom margins, the distance from the edge of the page to headers or footers, and page centering. Click Options to select paper, print quality, fonts, and device options.



Fig

Header and Footer :- If one wish to use headers or footers, use this dialog to create and position the text. The Custom buttons provide the ability to insert the page number, date, time, filename, or tab name. One can also arrange the header/footer information at the left, center or right.



Fig

Sheet :- It is used to it is set the print area, repeating row and column titles, and page printing order i.e. down then over or over then down. User can enter a print area by clicking the button in the Print area box and then dragging the desired cell range. Rows and Columns Print Titles can also be entered by picking the desired cells. User can also print gridlines, column and row headings, comments, and set black and white and draft quality printing.

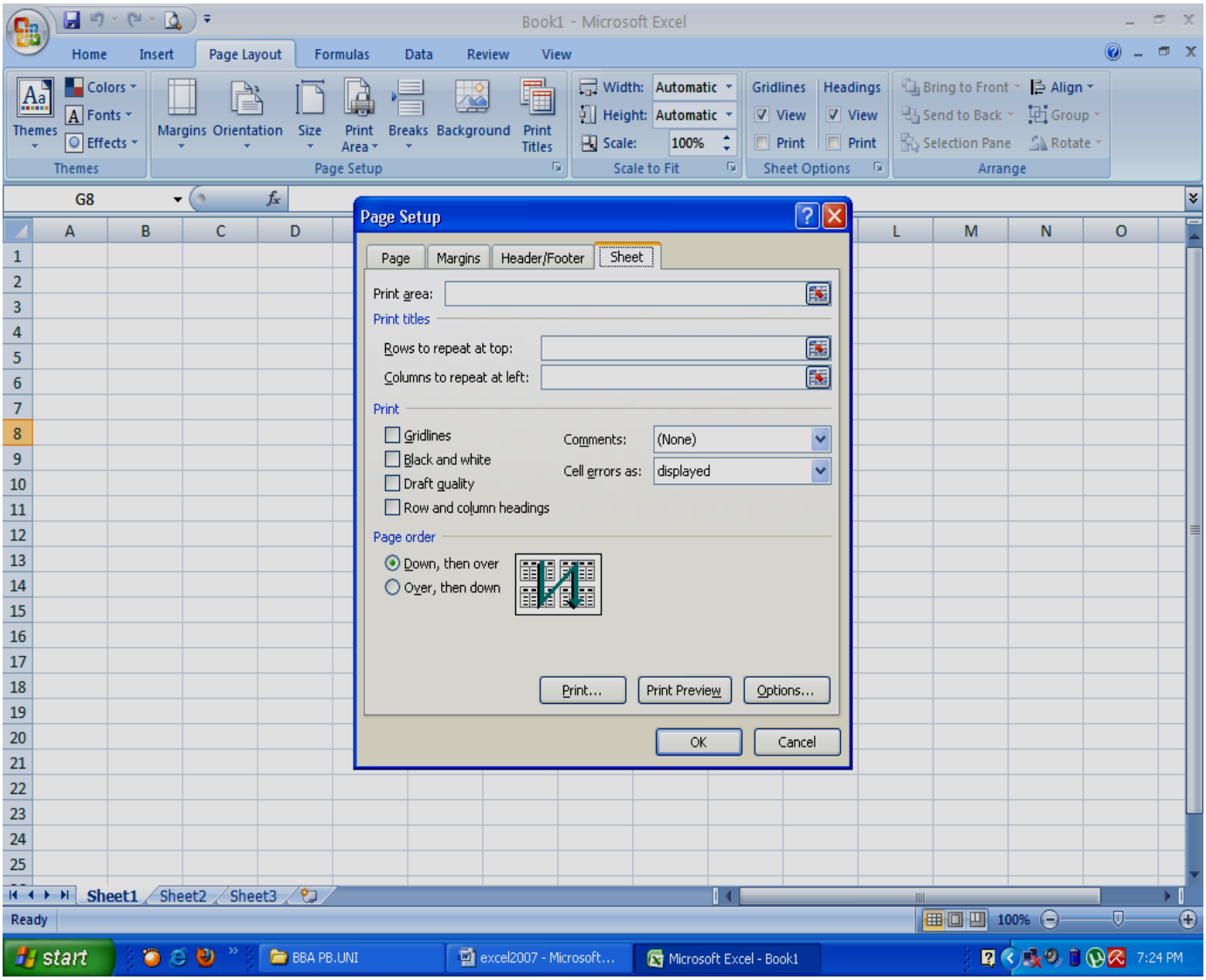
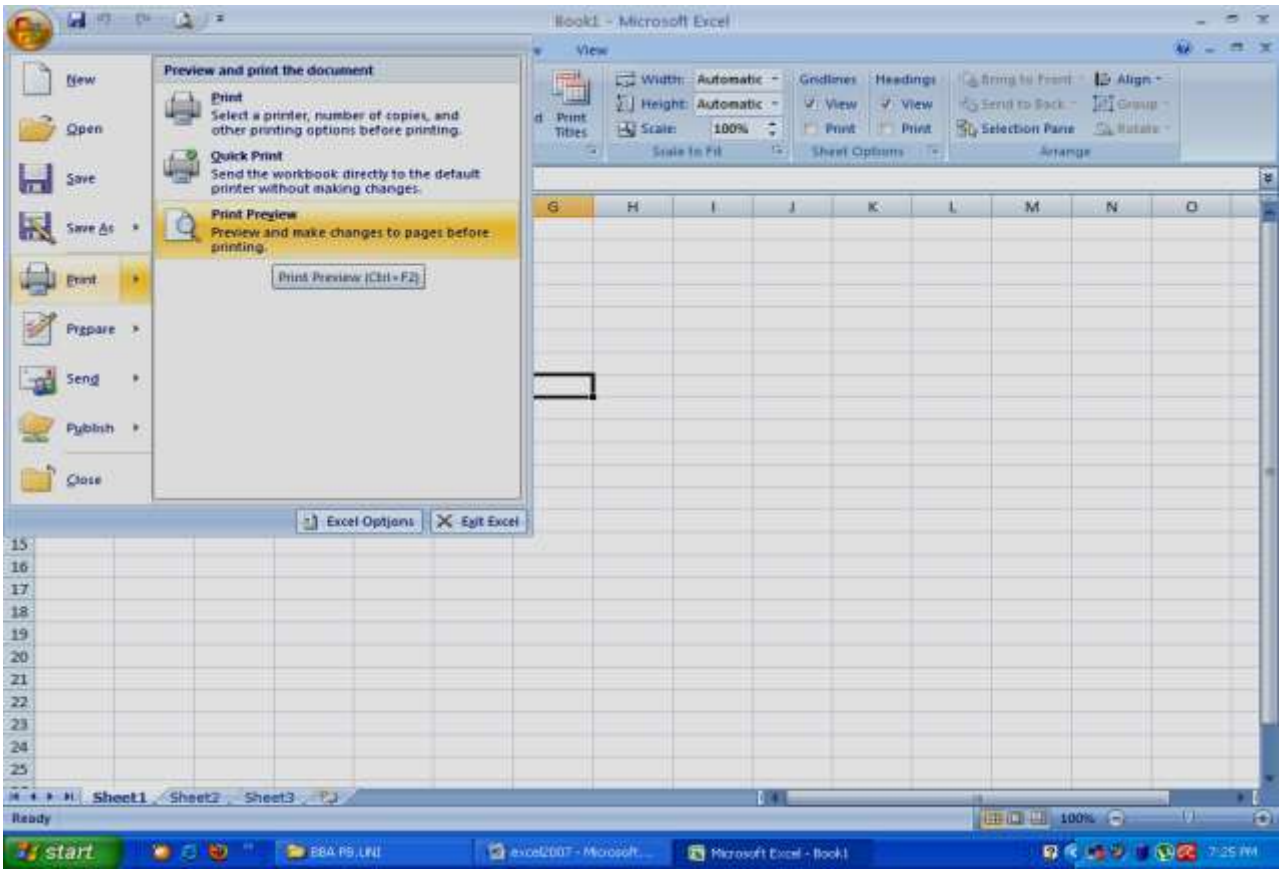


Fig.

Print Area: It is used to select or to clear the current range of selected cells.

Print Preview:- Print Preview is used to dispaly an image of the printed page before send it to printer.

It is noted that Print Preview gives you direct access to the Print and Page Setup dialog boxes. The other buttons let you page through a large worksheet, zoom (enlarge or reduce the display), display and adjust margin guidelines, close the preview, and display Help.


Book1 - Microsoft Excel
New
Open
Save
Save As
Print
Prepare
Send
Publish
Close
Preview and print the document
Print
Select a printer, number of copies, and other printing options before printing.
Quick Print
Send the workbook directly to the default printer without making changes.
Print Preview
Preview and make changes to pages before printing.
Print Preview (Ctrl+F2)
Excel Options
Exit Excel
View
Width: Automatic
Height: Automatic
Scale: 100%
Gridlines
Headings
View
Print
Print Titles
Bring to Front
Send to Back
Selection Pane
Align
Group
Rotate
Scale to Fit
Sheet Options
Arrange
G
H
I
J
K
L
M
N
O
15
16
17
18
19
20
21
22
23
24
25
Sheet1
Sheet2
Sheet3
Ready
100%
start
BBA P9.LNK
excel2007 - Microsoft...
Microsoft Excel - Book1
7:25 PM

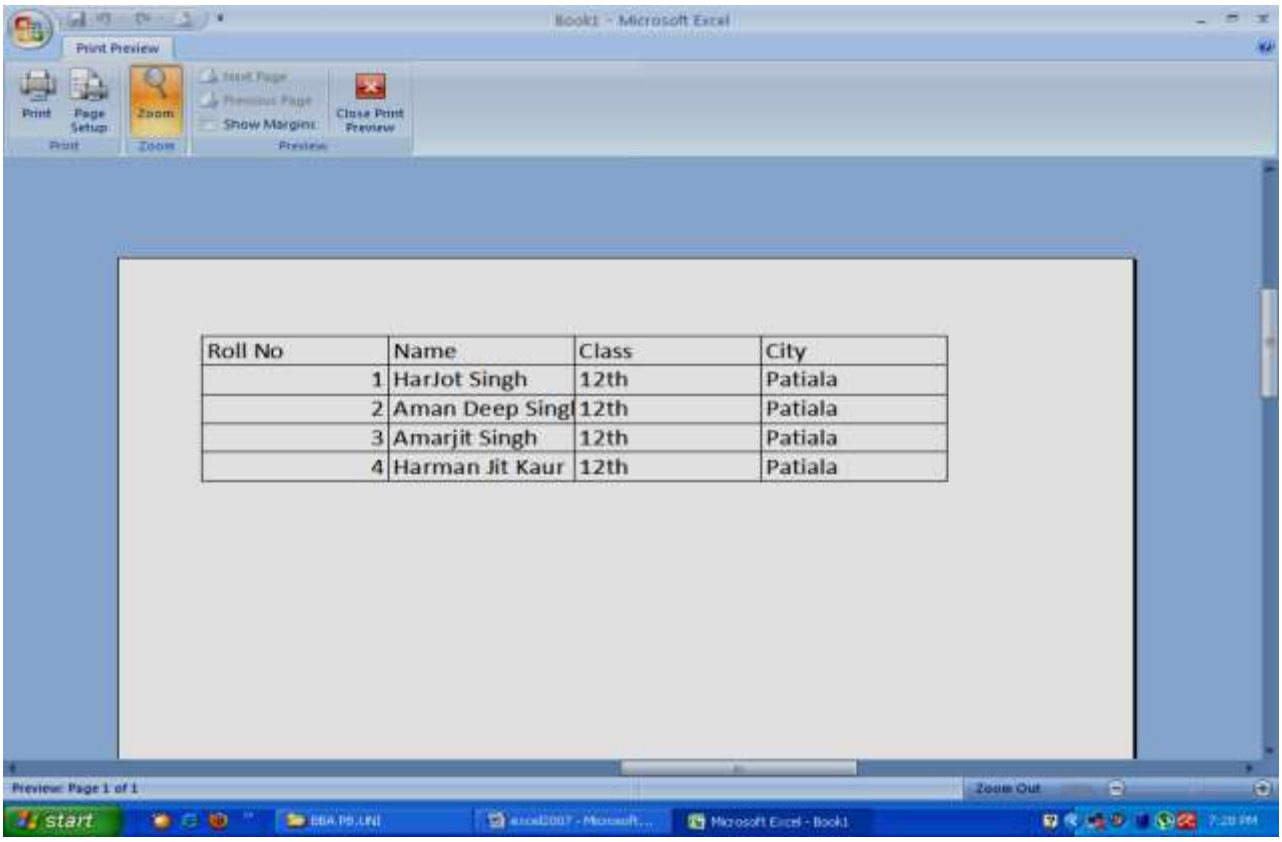


Fig.

Print :- This dialog is used to specify the pages to print use the printer to print your work.

One can also access the Print Preview dialog box here. One can start with this selection, perform all necessary preview and setup operations, and then print workbook.

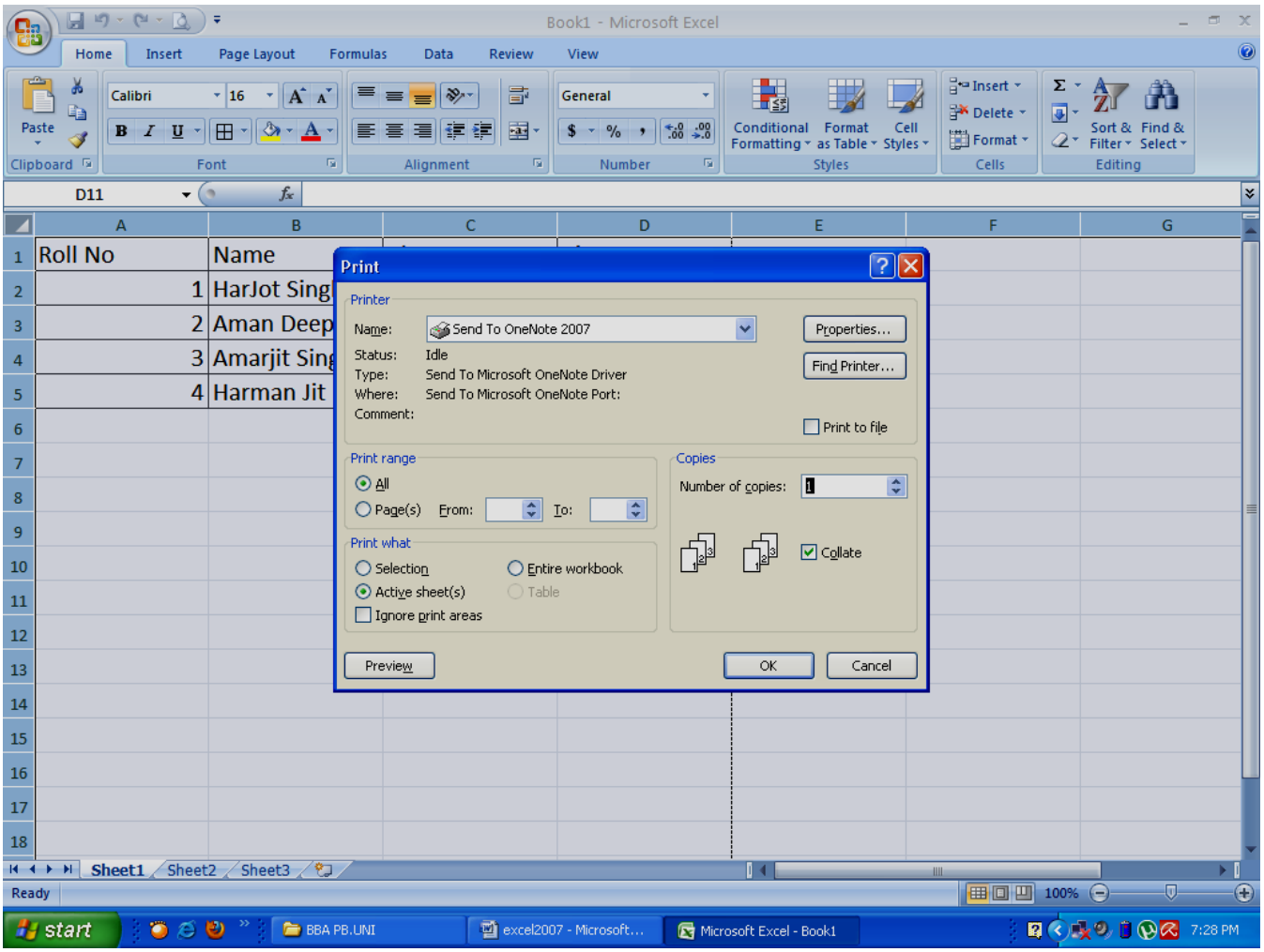
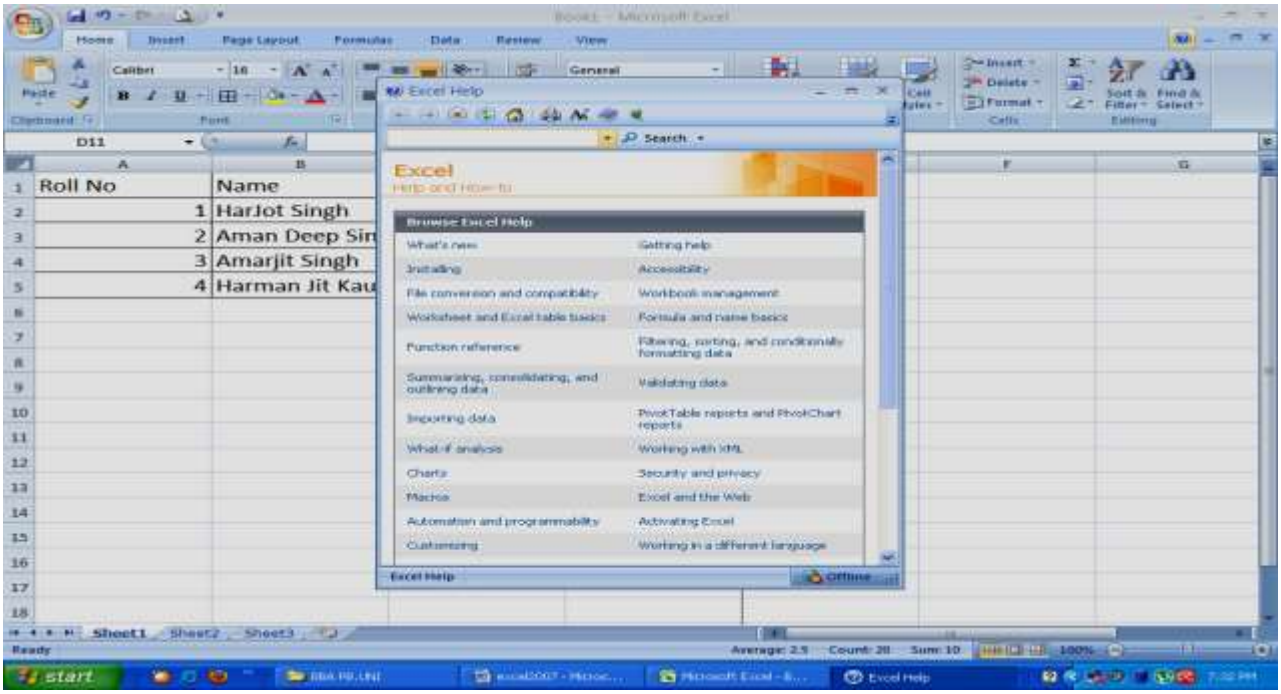


Fig.

4.1.9 MS-EXCEL HELP

MS-Excel offers many different ways to get help with any program. User can ask the office assistant for help that will appear automatically when MS-Excel is started. Note that there is a very powerful help system behind the Office Assistant. The office assistant is a little box with two twinkling eyes. User can take any type of help from the assistant or turn it off by clicking the close button in its upper right corner. User can also click the tip button or option button to get the help about any topic or menu option. A more convenient way to get help is through the content and index command on the help menu from the Ribbon. There are three options like contents, index and find. The contents tab displays all the help content about handling MS-Excel. This index option displays the list of help topics in an alphabetical order and the find option helps to locate a particular topic. Find option automatically builds up the index. User can also take help by using mouse pointer by opening the help options and selecting the massage “What’s This ?”. This will change the mouse pointer to a question mark and this question mark can be placed on any topic

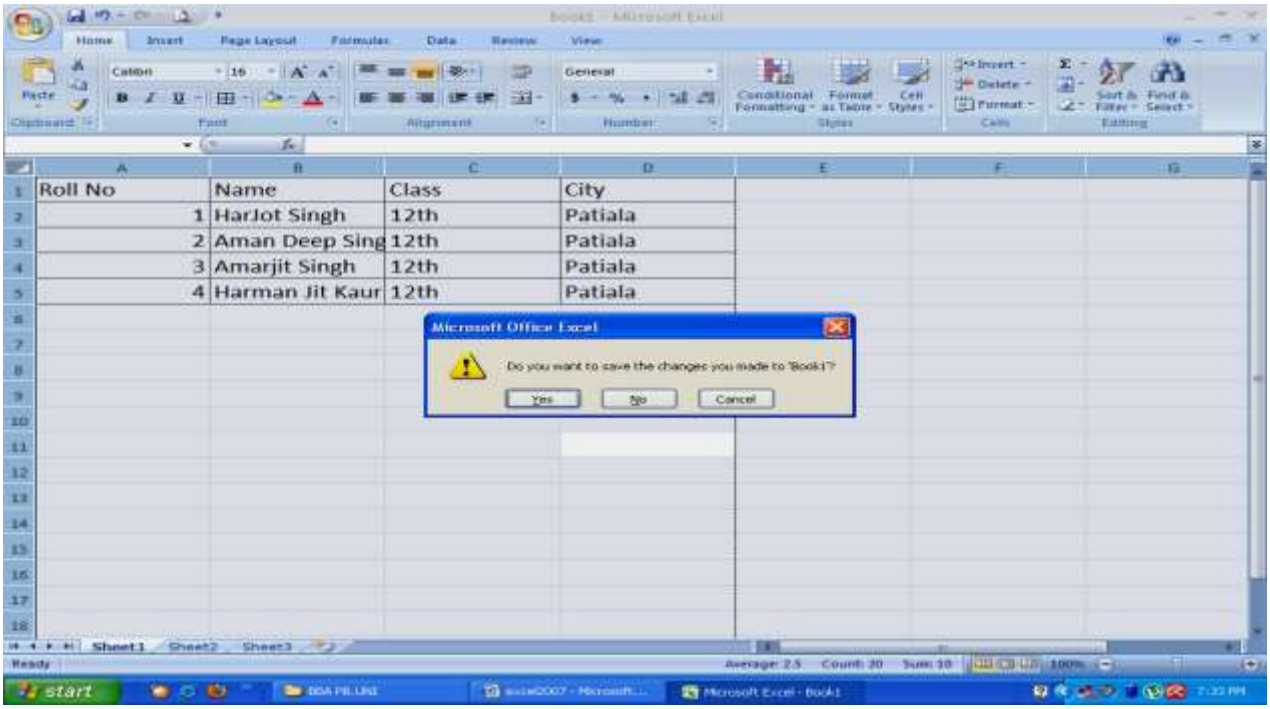
or button or Ribbon or option for help. A box will appear indicating the details about the concerned topic.



Fig

4.1.10 QUITTING EXCEL

The user can quit the Excel application by selecting Exit from the Office button. It is always recommended to save and close the file before quitting Excel. If a workbook has not been saved, Excel displays a confirmation box as shown below to confirm whether to save or quit without saving changes.



Fig

4.1.11 TEST YOUR UNDERSTANDING (A)

1. Explain various features of EXCEL.

……

……

……

……

2. Difference between Workbook and Worksheet.

……

……

……

3. Fill in the Blanks
   a. ---------- Intersection of Row and Columns.
   b. By default there are --------- sheet.
   c. Collection of worksheet is ----------.
   d. Excel has -------- rows and ------- columns in it worksheet.

4.1.12Review Question

1. Explain the usage of Excel in business?

2. What is the Anatomy of Excel Window?

3. What are the various features of Excel?

4. Differentiate between the followings:

1. Absolute and Cell Reference

2. Relative and Mixed Reference

3. Print and Print Preview

4. Undo and Redo

Answer Key 4.1.11

1. cell
2. three
3. workbook
4. 1048576, 16384
5. Tuple

Unit 4: Working with Workbook and Worksheet

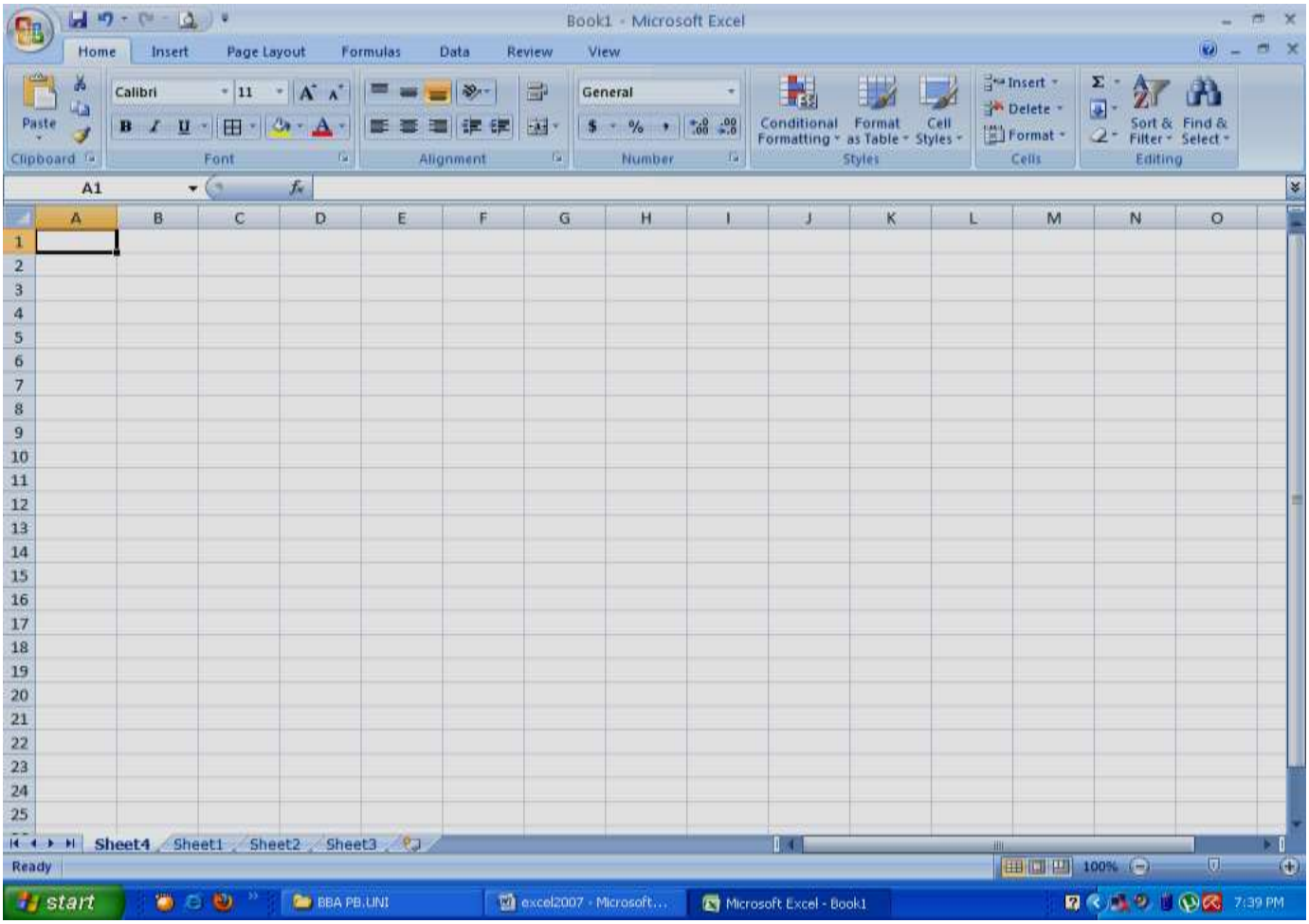
STRUCTURE

4.2.1 WORKBOOK

A workbook is an Excel file where data is stored. It consists of many worksheets. A worksheet is a page in the workbook where data can be entered. The current sheet is always highlighted in the sheet tab. Sheet belonging to a particular application can be stored in the same workbook.

When the workbook is opened, all the worksheets contained in that workbook are automatically opened. Since each workbook contains many sheets you can organize various types of related information in single file.

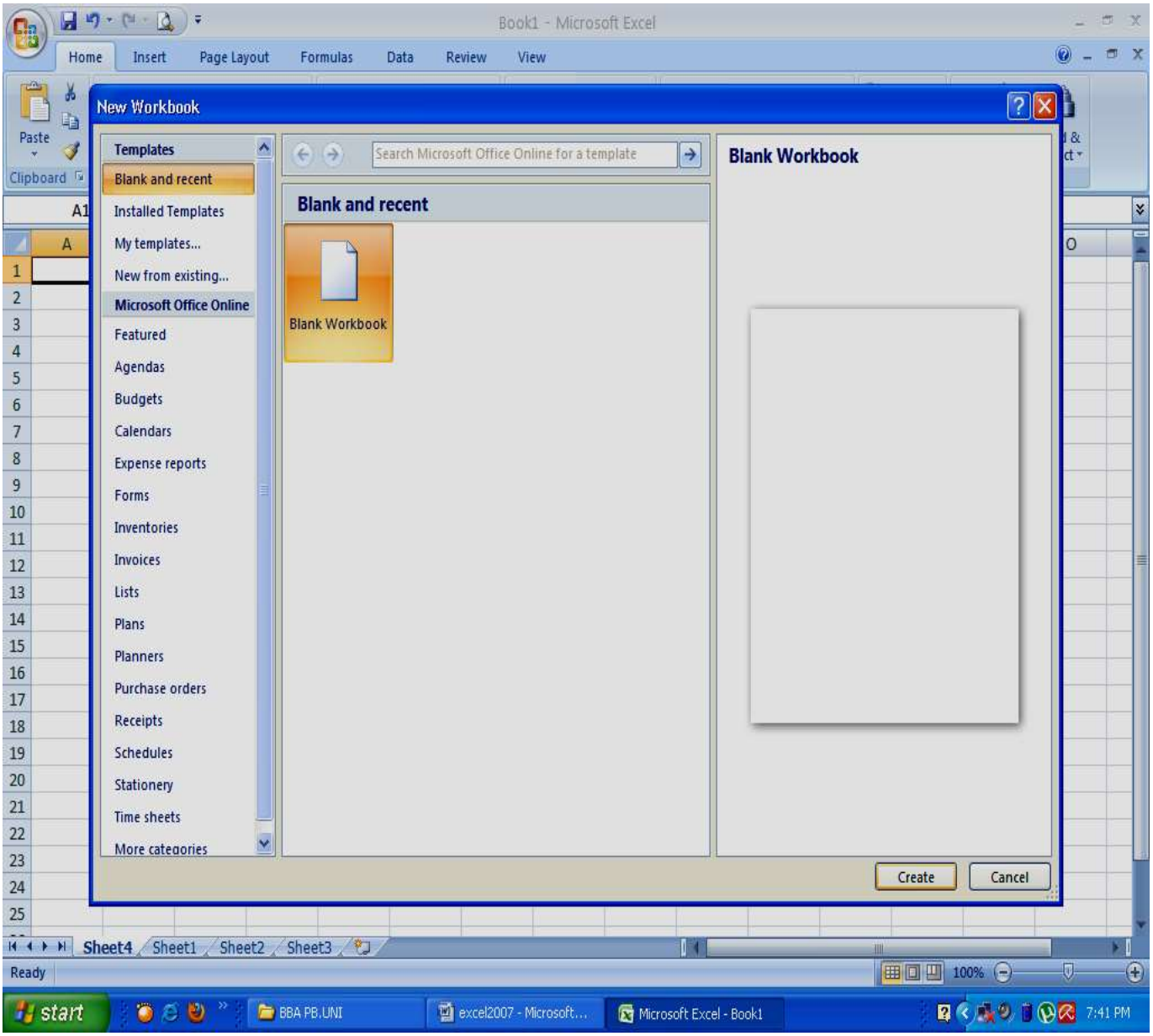
By default a workbook contains three worksheets. To move from one sheet to another sheet, click the sheet tabs.



Fig

4.2.2 Creating workbook

A new Workbook is created whenever you open MS-Excel or by default whenever user starts MS-Excel, it automatically create a new Workbook and name the file "Book1". File menu or Standard Tool bar below menu bar contains the command New by clicking New command in Office button you can create a new Workbook.



Fig

4.2.3 Opening and exiting workbook

You can open an existing workbook by clicking the "Open" command from Office button. When you click "Open" command a window will appear In front of you. if required file is saved in different folder or drive then change the current folder or drive by clicking "Look in" button to move to the required folder or drive then by selecting your required XLS or MS-Excel file press "Open" button.

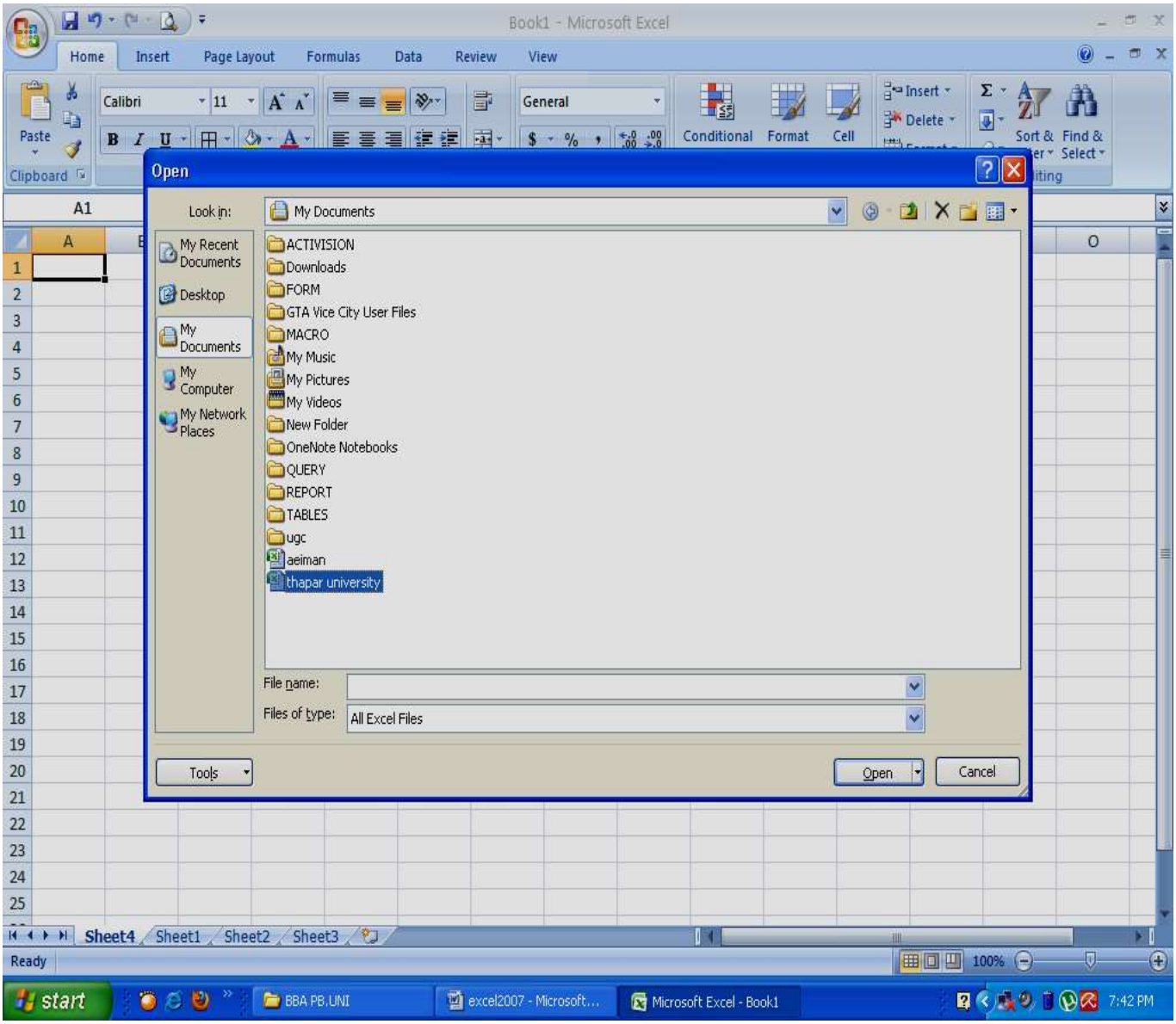


Fig.

4.2.4 Saving workbook

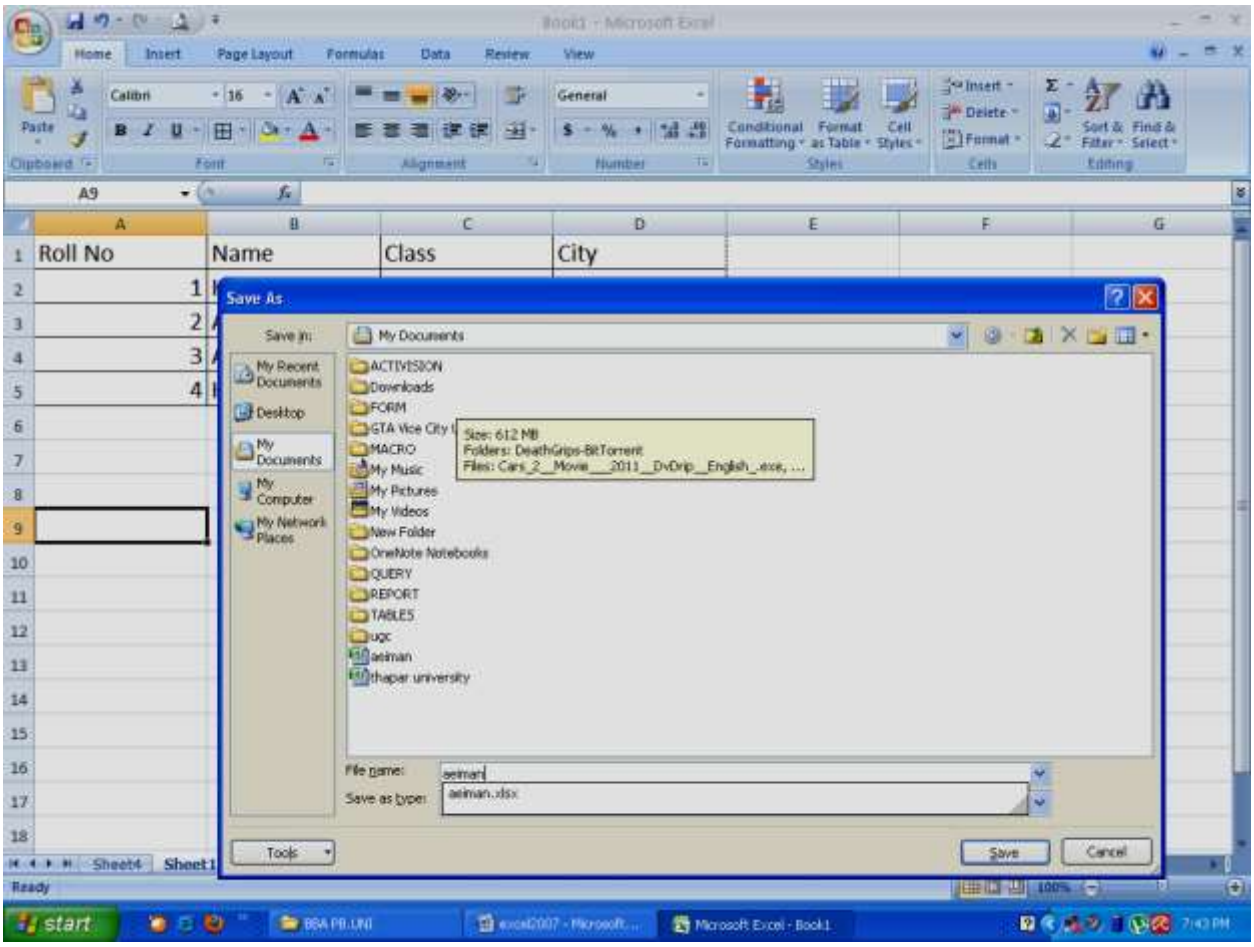
You will have to saved the workbook to secondary storage, if you want to use it again. While saving a file, a unique name is provided to the file. MS-Excel provides a temporary name (Book) to file unless you save it. Performs the following steps to save the workbook:

(i) Click at the office button. A pull down menu will appear. Select the save command from them.

(ii) On doing so, a dialog box appear. For this you can use 'Ctrl+S' keys simultaneously (Shortcut keys).

(iii) You can type the appropriate file name in the 'File name' text box. After doing this click at save button or press down the enter key from the keyboard.

.



Fig

The various types in which you can save the workbook are like Web page, template, text etc.

4.2.5 Saving Copy of Workbook (Save as)

Sometimes you need to save a copy of file with a different name than you can use 'Save As' command from office button. A copy of file can be used for backup purpose or where same text appears at the starting of two or more workbooks and rest of the contents are different. For example in annual report and annual magazine, introduction of the company may remain the same.

Performs the following steps :

(i) Open the original file.

(ii) Click Save as option from office button.

(iii) Choose the folder in which you want to save your file. MS-office files are by default saved in "My Document" folder.

(iv) Type the name of the duplicate file and click save button.

(v) You will get a copy of the file with a different name.

4.2.6 Closing Workbook

Once you have done your work in the Workbook and you want to close it.

The following steps need to be performed:

(i) Click at the Ribbon from the menu bar. A cascading menu will appear.

(ii) Select the close command from them with the help of mouse.

(iii) On doing so the document window will close, if the contents of that document saved already.

(iv) If the contents of that file are not saved a dialog box will appear after click at the close button.

If you click the 'Yes' button it would save the changes and close the document if you click at the 'No' button it would not save the changes.

4.2.7 WORKSHEET OR SPREADSHEET

A worksheet consists of rows and columns. Rows run horizontally in a sheet and are identified by numbers. Columns run vertically in a sheet and are identified by letters. The information of row and column is called a cell. Cells are named by their position in the columns and rows. The column letter followed by the row number is called a cell reference. Light gray line surround each cell and are known as Gridlines. Spreadsheet programs are developed to automate tasks such as technical calculations, inferential statistics, analyzing data, etc. It also has a powerful program for graphical preparation of numerical data. It is commonly used in:

- Production and planning
- Personnel Management,
- Marketing
- Payroll and Accounting
- Cost Analysis
- Budget management and sales forecasting.

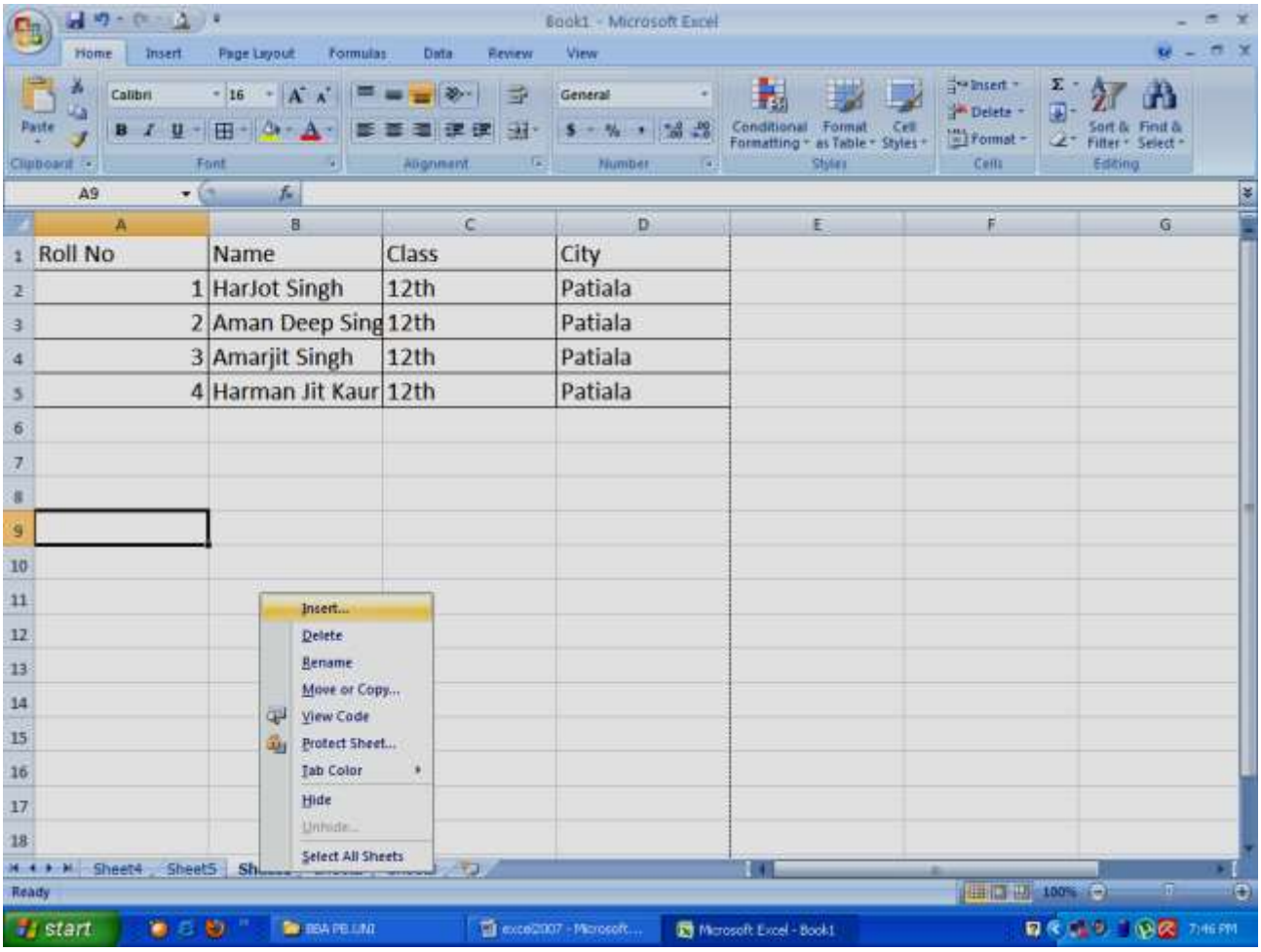
4.2.8 Inserting Worksheets

To add a new worksheet click Insert on Worksheet from the Home Tab. The second method to insert the worksheet is to select the worksheet from the worksheet tab by clicking

mouse, then click the right mouse button, select the insert command to insert new worksheet before the present selected worksheet.

Fig

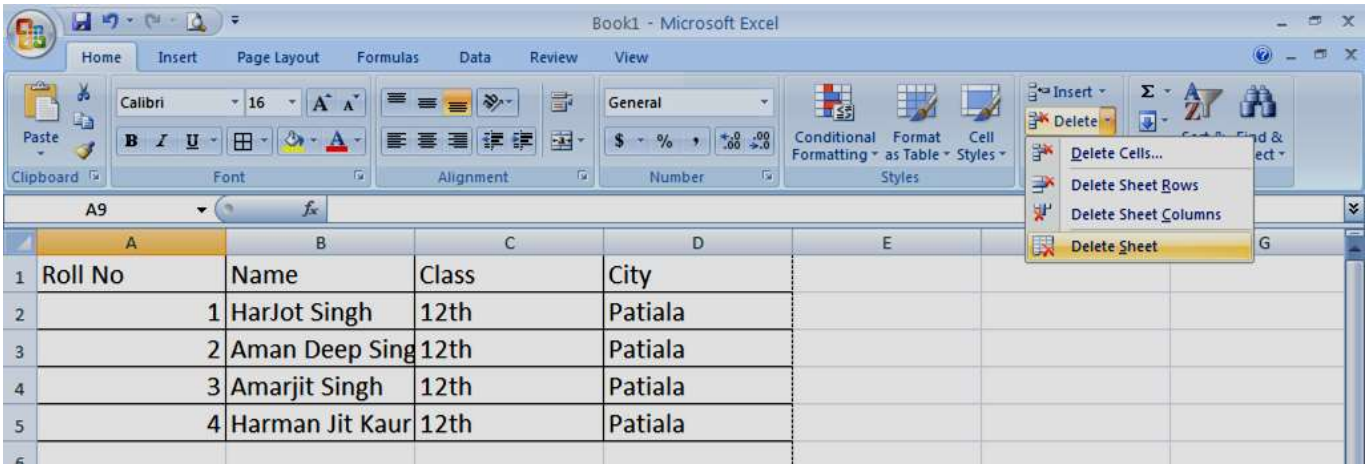
To add multiple worksheets, select the multiple worksheet by holding the SHIFT button and then click right mouse button and select the insert command, as you selected 3 worksheet, before clicking right mouse button the 3 new worksheet will be inserted in the worksheet tab.



Fig

4.2.9 Deleting Worksheet

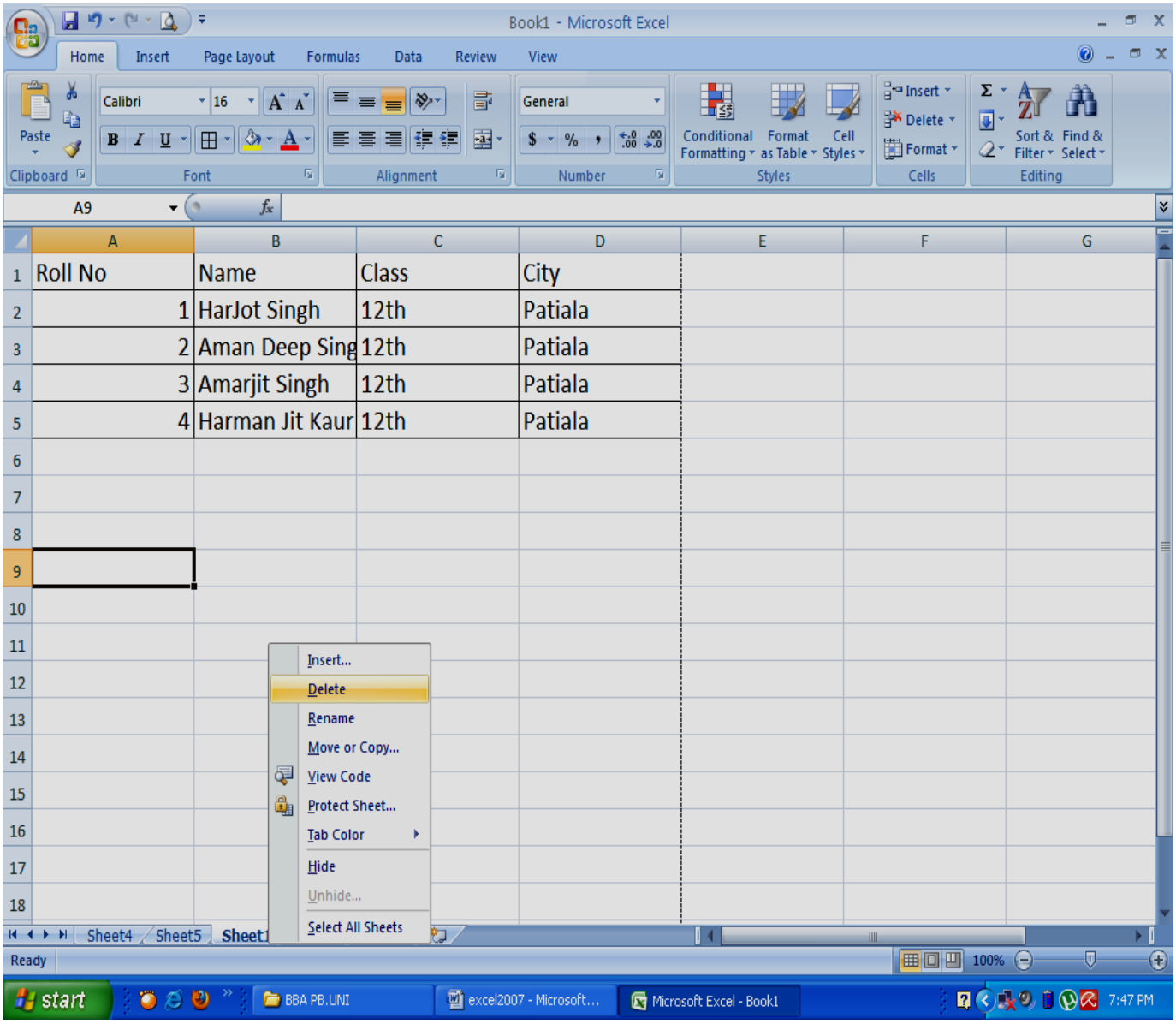
To delete an existing worksheet select the worksheet you are wanted to delete click Delete Worksheet from the Home Tab. The second method to delete the worksheet is to select the worksheet from the worksheet tab by clicking mouse, then click the right mouse button, select the delete command the selected worksheet will be deleted.



Fig

To delete multiple worksheets, select the multiple worksheet by holding the SHIFT button and then click right mouse button and select the delete command, as you selected 3 worksheet, before clicking right mouse button the all selected worksheets will be deleted from the worksheet *tab.

*



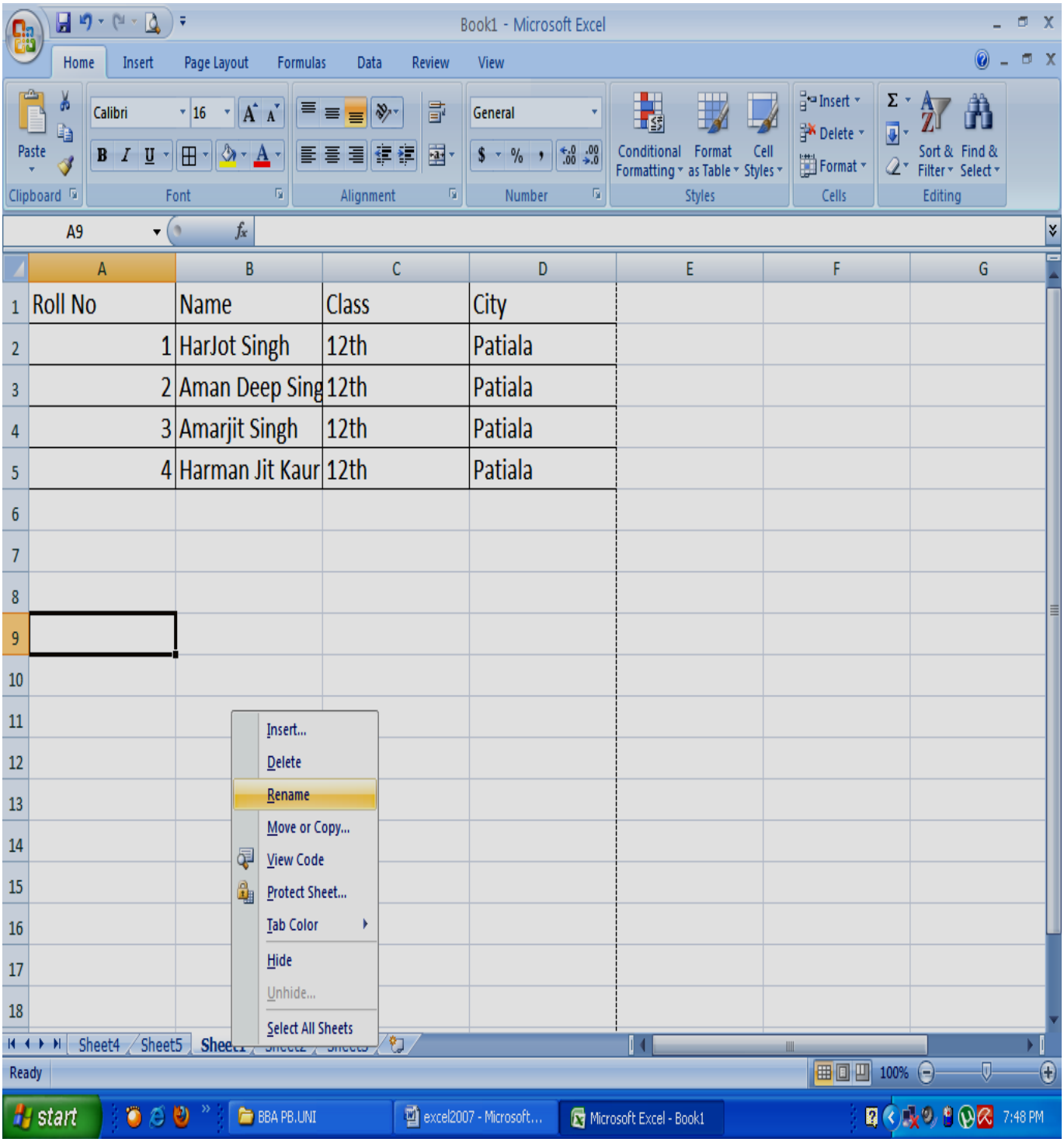
Fig

4.2.10 Renaming and Moving Worksheets

There are always three worksheets available whenever you open a new workbook, the more sheets can be inserted or deleted as you have discussed earlier. You can change the name of existing worksheets by the same method as you have discussed for inserting or deleting the

sheets. Select the sheet then click the right mouse button, here appear the command for renaming the sheet select the command and enter the new name of sheet.

Two ways to Move or Copy worksheets, move the sheet within the same workbook and copy or move the sheet from one workbook to other work book:



Fig

1. To move the worksheet from one place to other within the same workbook is to select the worksheet from the sheet tab and DRAG the sheet to target location by holding the mouse button or to select the worksheet and click the right mouse button to move the selected sheet to required target location.
2. To move or copy the worksheet to another workbook, select the worksheet, click the -right mouse button and select the copy or move command to move or copy the worksheet to new workbook.

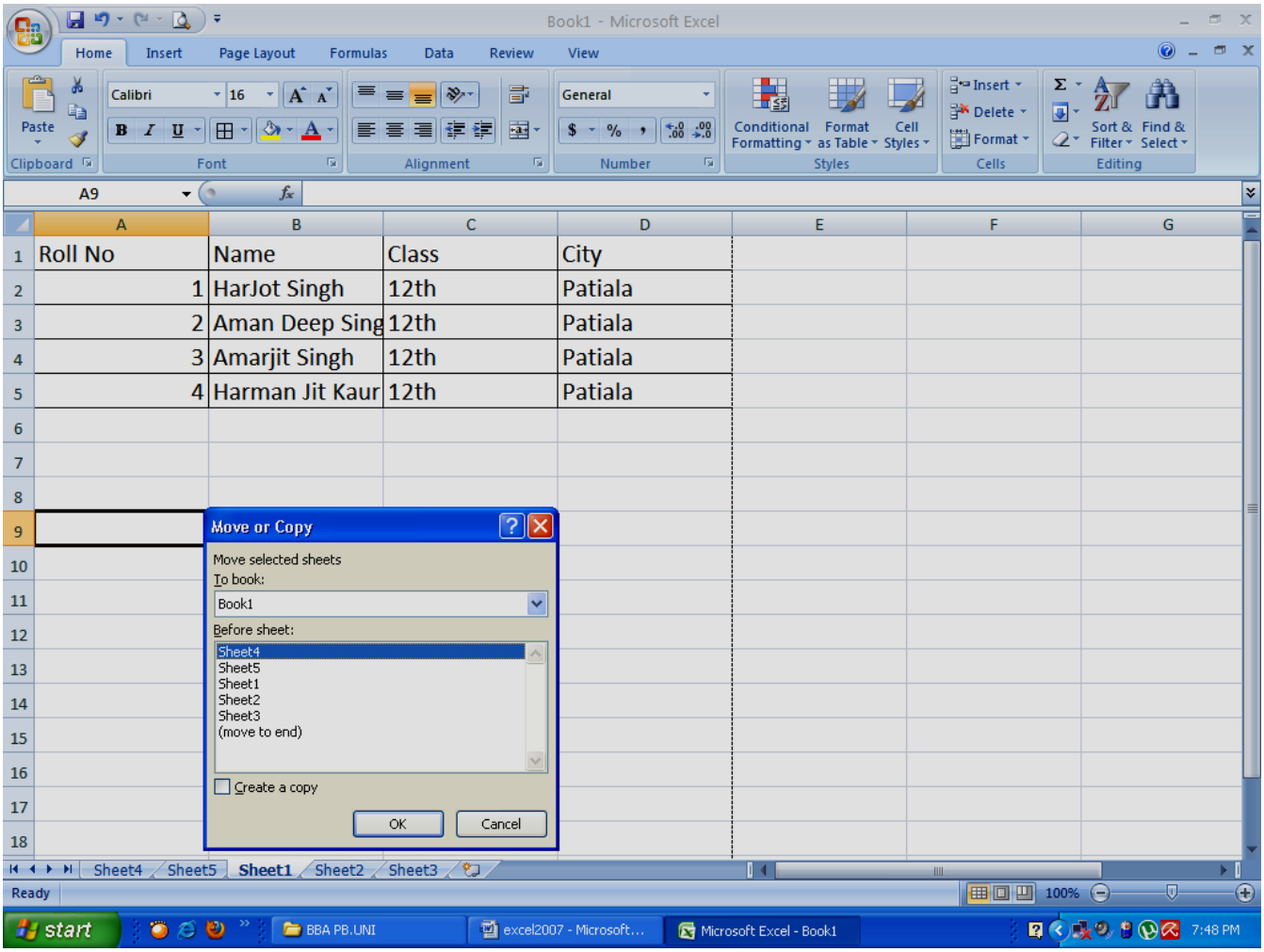


Fig.

4.2.11 CELL (ADDRESS AND RANGE)

Worksheet is divided into columns and rows, intersection of column and row is called cell. A rectangular box that basically contains the data in MS-Excel. It has a specific width and height, although its height or width can be changed by the user according to their requirement.

A cell where the data is entered by the user or selected cell with black outline is called Active cell. Every cell in MS-Excel has a unique name which is called Cell Address like A1, B1, C1 etc.

4.2.11.1 Cell Range

A range is a rectangular group of cells. The smallest range is a single cell and the largest range includes all the cells in the worksheet. A range can include cells from same sheet or cells from adjacent sheets.' Ranges are defined by the addresses of two opposite or diagonally paired corner cells separated by a colon or two dots.

Ranges can be set when only a part of the worksheet has to be printed. To print the selected range, follow the steps given below :

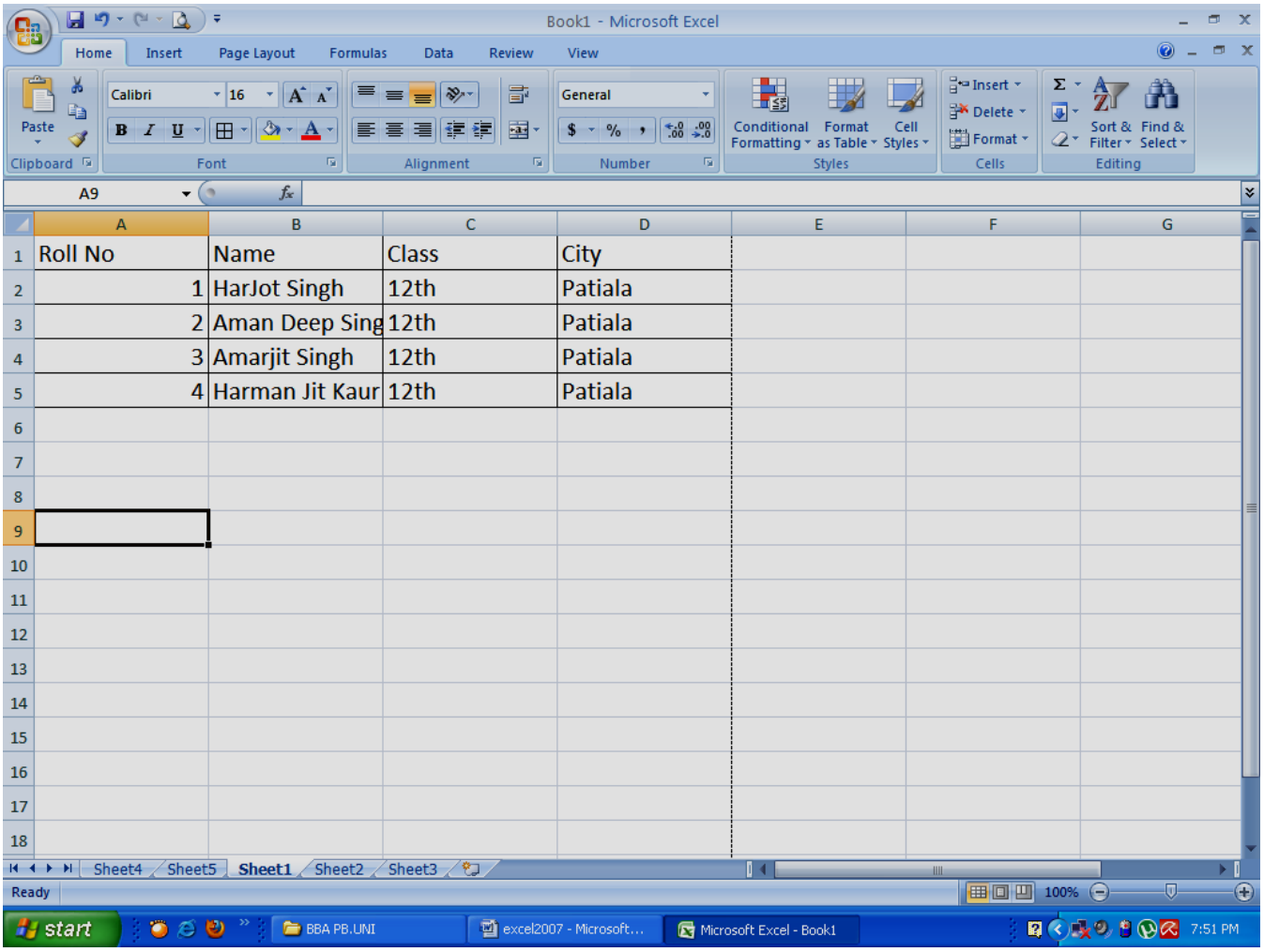
- Select the range of cells to be printed.
- In the Page Layout, point to the Print Area option and click Set Print Area. The print area set is indicated by a dotted line around it in the worksheet.
- To check click the Print Preview button.

To print non-adjacent columns or rows in a table, hide the columns or rows not needed to print. To do this select the rows or columns and right-click the selection and select Hide.

4.2.12MANIPULATING CELL CONTENTS

4.2.12.1 Entering Data in cells

Text, numbers and dates can be entered into any cell of a worksheet. Data can be entered in the active cell by clicking the enter box in the formula bar or by pressing F2. An entry can be cancelled by clicking the cancel button ☒ on the formula bar or by pressing the ESC key. Each cell can hold up to characters. Text is left aligned and numbers are right aligned in Excel and this default alignment is called General alignment. The below fig. gives a clear idea on how the data is displayed.



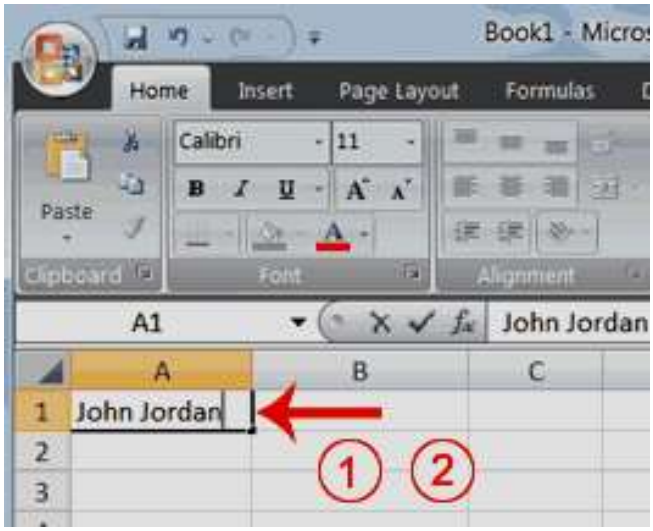
Fig

The column headings may not appear properly, if the column width is not large enough to contain them. To increase the column width, place the mouse on the right border of the column whose width has to be increased and click drag the mouse button.

- First, place the cursor in the cell in which you want to start entering data.
- Type some data, and then press Enter.
- If you need to delete, press the Backspace key to delete one character at a time.

Example To Enter Data

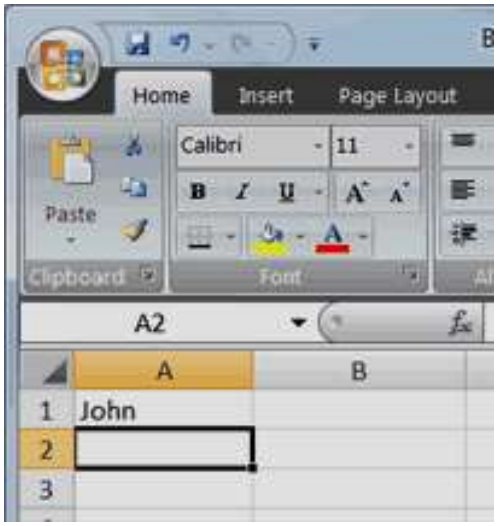
1. Place the cursor in cell A1.
2. Type **John Jordan**. Do not press Enter at this time.



Fig

4.2.12.2 Delete Data

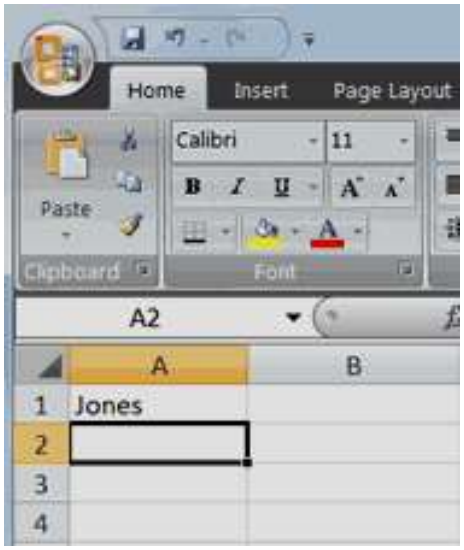
- The Backspace key erases one character at a time.
- Press the Backspace key until Jordan is erased.
- Press Enter. The name "John" appears in cell A1.



Fig

4.2.12.3 Edit a Cell

After you enter data into a cell, you can edit the data by pressing F2 while you are in the cell you wish to edit.



Fig

- If you want to Change "John" to "Jones."

Method 1

1. Move to cell A1.
2. Press F2.
3. Use the Backspace key to delete the "n" and the "h."
4. Type **nes**.
5. Press Enter.

Method 2

Editing a Cell by Using the Formula Bar

You can also edit the cell by using the Formula bar. You change "Jones" to "Joker" in the following way.

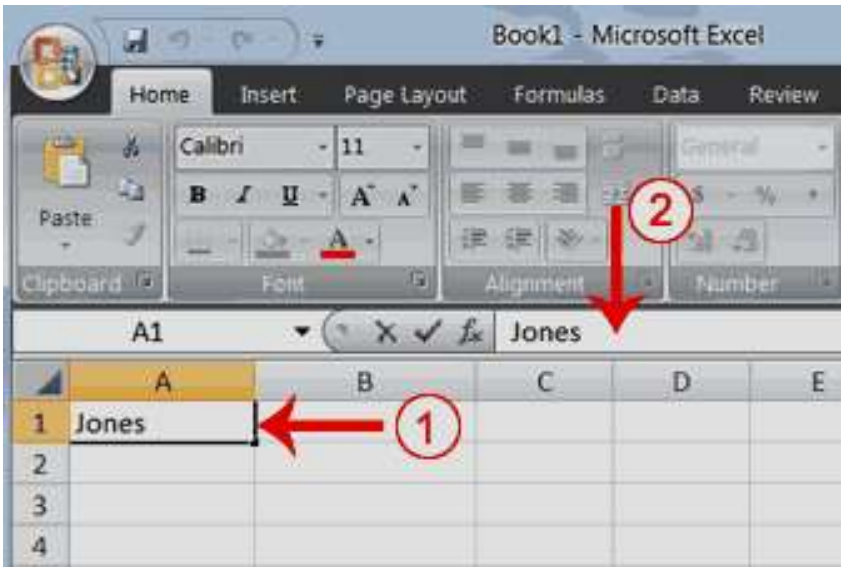


Fig.

1. Move the cursor to cell A1.
2. Click in the formula area of the Formula bar.

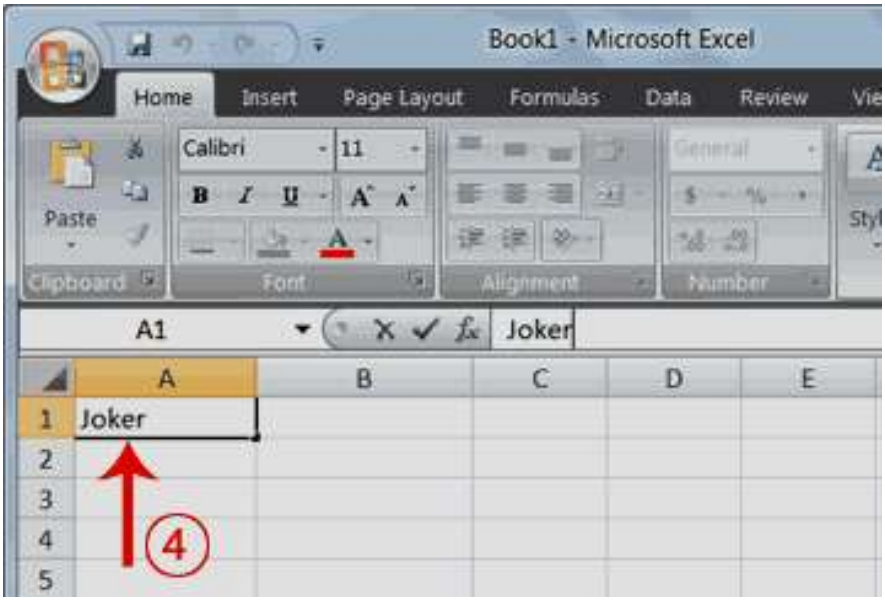


Fig.

3. Use the backspace key to erase the "s," "e," and "n."
4. Type **ker**.
5. Press Enter.

Method 3

Edit a Cell by Double-Clicking in the Cell

You can change "Joker" to "Johnson" as follows:

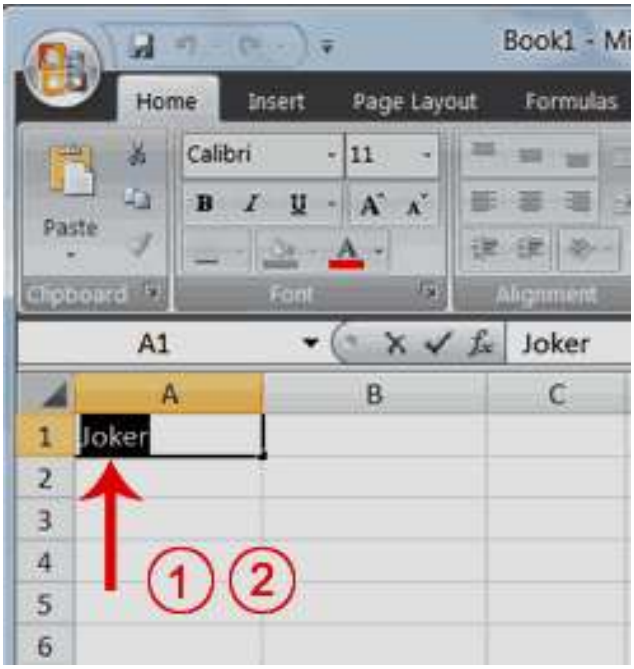


Fig.

1. Move to cell A1.
2. Double-click in cell A1.
3. Press the End key. Your cursor is now at the end of your text.

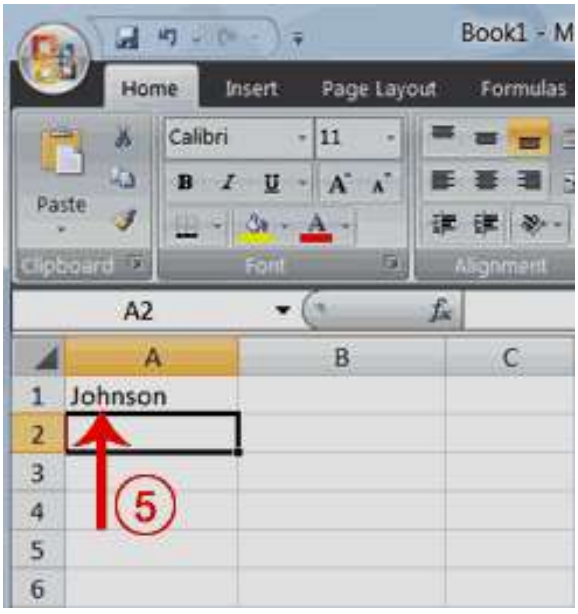


Fig.

4. Use the Backspace key to erase "r," "e," and "k."
5. Type **hnson**.
6. Press Enter.

Method 4

4.2.12.4Change Cell Entry

Typing in a cell replaces the old cell entry with the new information you type.

1. Move the cursor to cell A1.
2. Type **Cathy**.
3. Press Enter. The name "Cathy" replaces "Johnson."

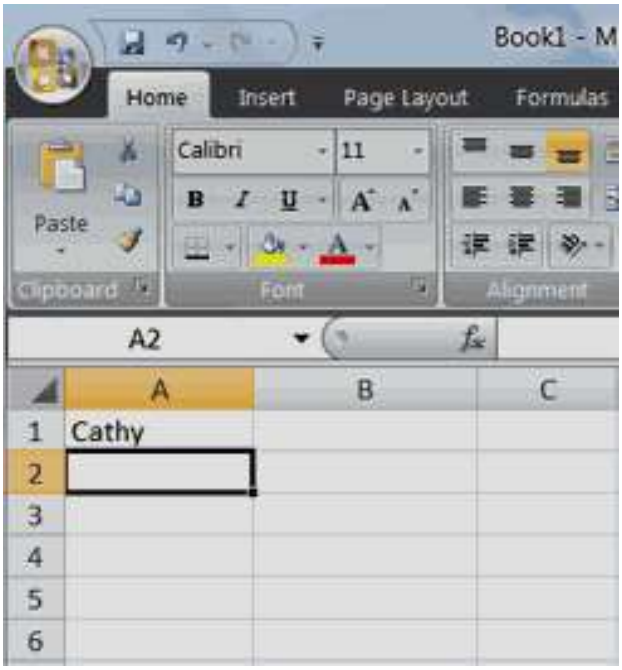
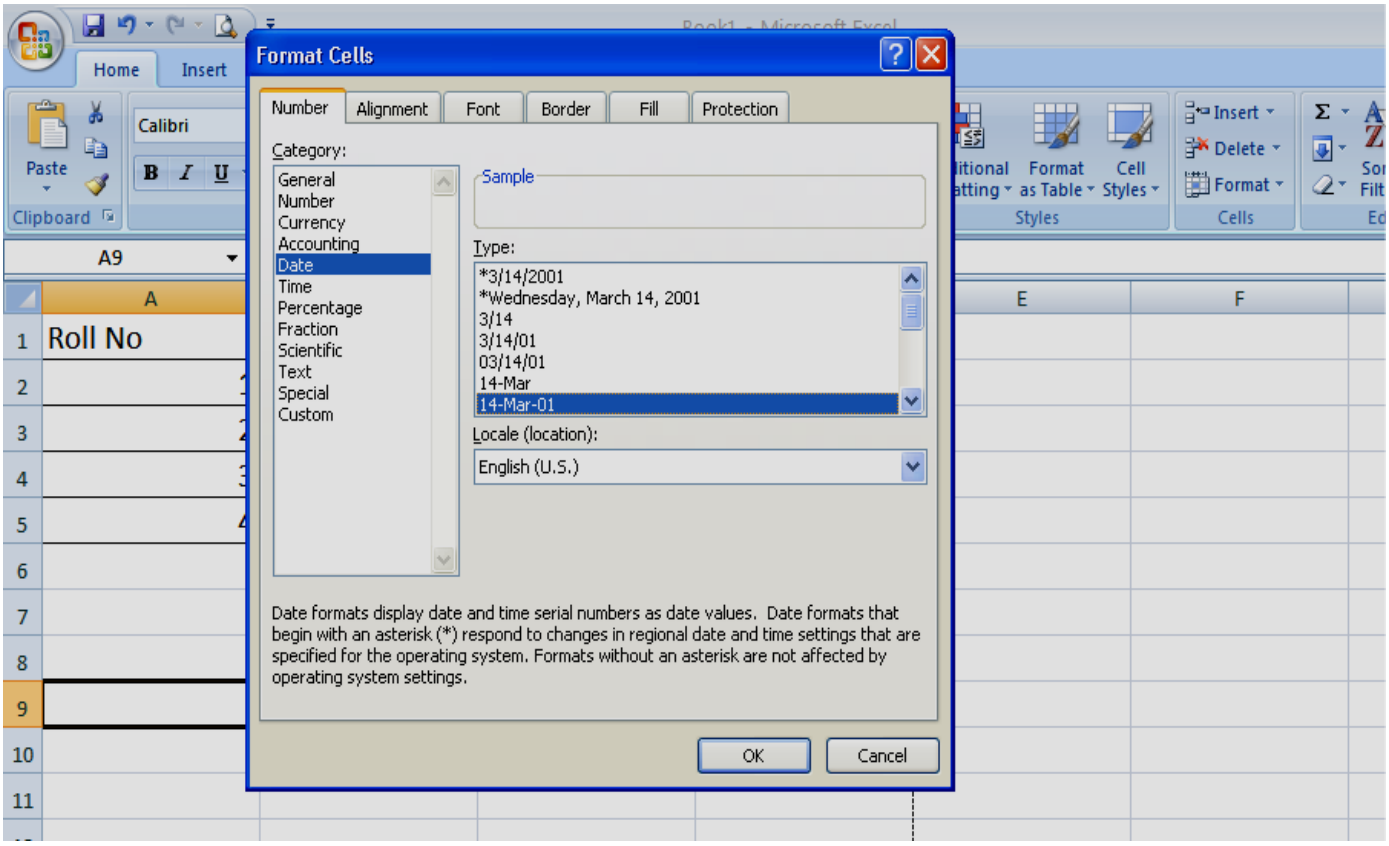


Fig.

4.2.12.5 Entering date and time

Microsoft Excel stores dates as sequential numbers known as serial values. This scheme allocates one digit for every day from January 1 to December 31. Excel also provides formatting and formulae to convert the date serial number to a specific calendar date. Dates and times are values and hence they can be added, subtracted and included in other calculations. By default the dates are displayed in two digit years.

In Excel the time is added to the date serial number as a decimal fraction of a 24 hour day. Therefore, midnight is 0.000000, noon is 0.500000 and 11:59:59 PM is 0.999988. Whenever the date or time is to be changed, the cell format is automatically changed from the normal format to the appropriate date or time format.



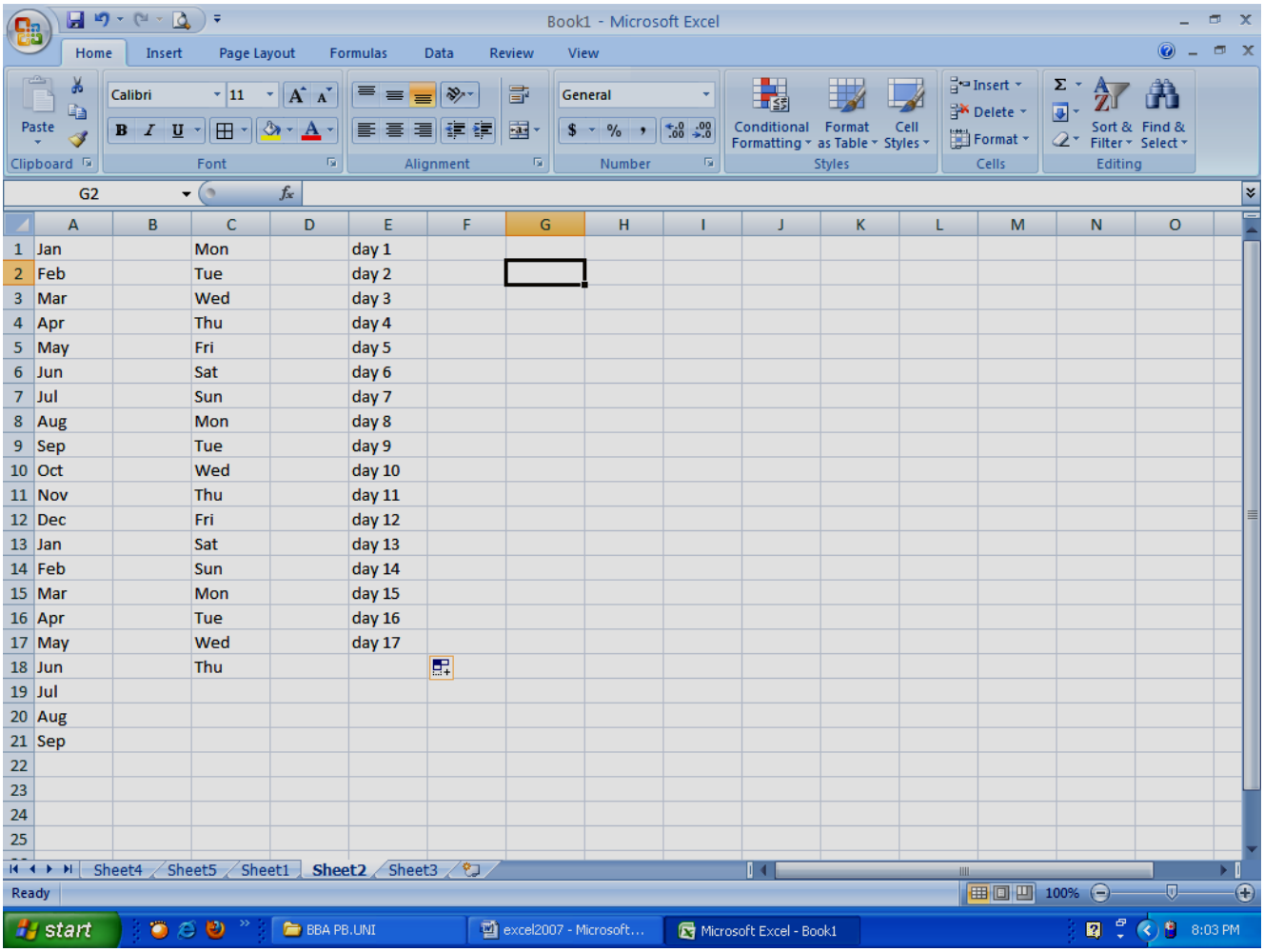
Fig

4.2.12.6 Entering the data in Series

Whenever the user wants to fill a cell range with data forms as a series (e.g. 1,2,3,4 or Jan, Feb or Mon, Tue) the data input can be automated.

This can be achieved by using the fill handle. The fill handle is a black square located on the lower right corner of the selected cell. This is called Auto fill feature.

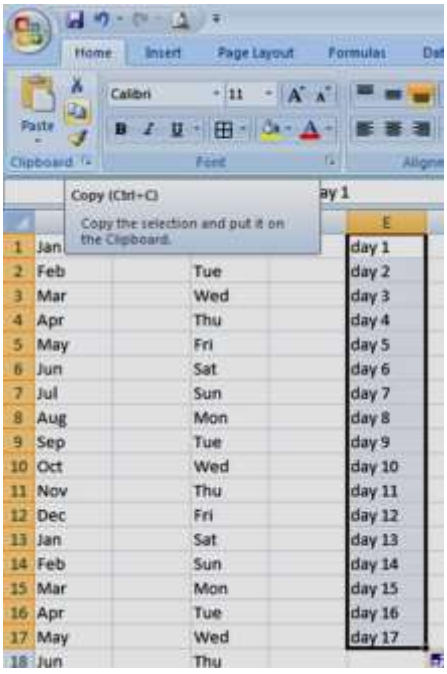
For example, to generate month names in a range of cells, enter Jan into cell Al and point to the fill handle with the mouse, the mouse pointer changes to a black cross. Click and drag through the cells Al to A12 and then release the mouse button. The series of months from January to December will be filled into cells Al through A12 as shown in Fig.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Jan		Mon		day 1										
2	Feb		Tue		day 2										
3	Mar		Wed		day 3										
4	Apr		Thu		day 4										
5	May		Fri		day 5										
6	Jun		Sat		day 6										
7	Jul		Sun		day 7										
8	Aug		Mon		day 8										
9	Sep		Tue		day 9										
10	Oct		Wed		day 10										
11	Nov		Thu		day 11										
12	Dec		Fri		day 12										
13	Jan		Sat		day 13										
14	Feb		Sun		day 14										
15	Mar		Mon		day 15										
16	Apr		Tue		day 16										
17	May		Wed		day 17										
18	Jun		Thu												
19	Jul														
20	Aug														
21	Sep														
22															
23															
24															
25															

Fig

4.2.12.7 Copying Data



1	Jan	Mon	day 1
2	Feb	Tue	day 2
3	Mar	Wed	day 3
4	Apr	Thu	day 4
5	May	Fri	day 5
6	Jun	Sat	day 6
7	Jul	Sun	day 7
8	Aug	Mon	day 8
9	Sep	Tue	day 9
10	Oct	Wed	day 10
11	Nov	Thu	day 11
12	Dec	Fri	day 12
13	Jan	Sat	day 13
14	Feb	Sun	day 14
15	Mar	Mon	day 15
16	Apr	Tue	day 16
17	May	Wed	day 17
18	Jun	Thu	

Fig

While copying or moving data, a copy of that data is placed in the clipboard. The clipboard provided by Office 2007 can store multiple bits or data (up to 12). To copy a range of data, select the range and press CTRL+C or click the Copy button in the Standard toolbar. The icons are the same as in MS-Word. Select the destination cell and click the Paste button from tb toolbar menu. The Copy and Paste commands can be easily accessed from the shortcut menu.

4.2.12.8 Moving Data

Moving data is similar to copying, except that the data is removed from its original place. To move data choose the Cut button from the Standard toolbar.

Using Drag and Drop

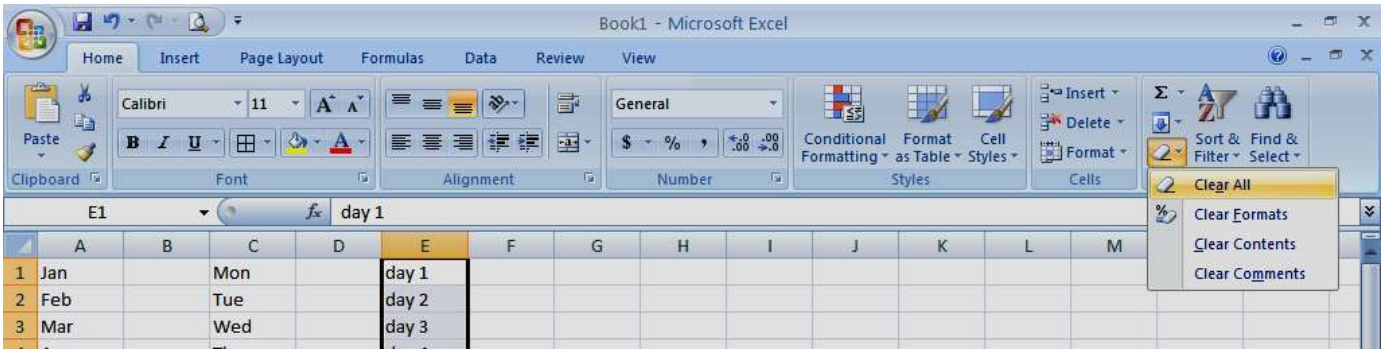
The fastest way to copy is to drag and drop the data. To do this, select the cells to be copied, hold down the CTRL key and drag the border of the selected range. On releasing the mouse button the data is copied to the new location. The data gets moved to the new location if the border is dragged without holding down the CTRL key.

To copy data to a different sheet, press CTRL+ALT while dragging the selection to the sheet's tab. Excel switches to that sheet, where the selection can be dropped in the appropriate location.

The drag and drop feature can be used to copy or move data to the Office clipboard.

4.2.12.9 Deleting data

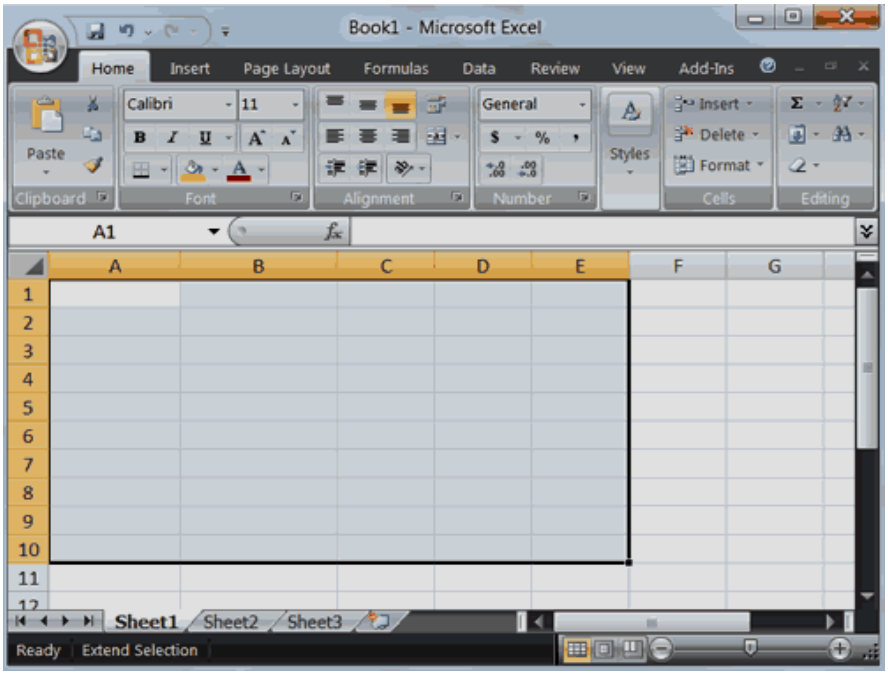
To delete data in a cell or range of cells, select the cell or the range and press the DEL key. The Edit Clear command can be used to delete only the formatting of the cell(s). The Clear command can be used to clear the format, contents, comments or all of them.



Fig

The Edit Delete command removes the cells and then shifts the surrounding cells to take over their place.

4.2.12.10 Select Cells



Fig

If you wish to perform a function on a group of cells, you must first select those cells by highlighting them. The following example will help you how to select.

Method 1

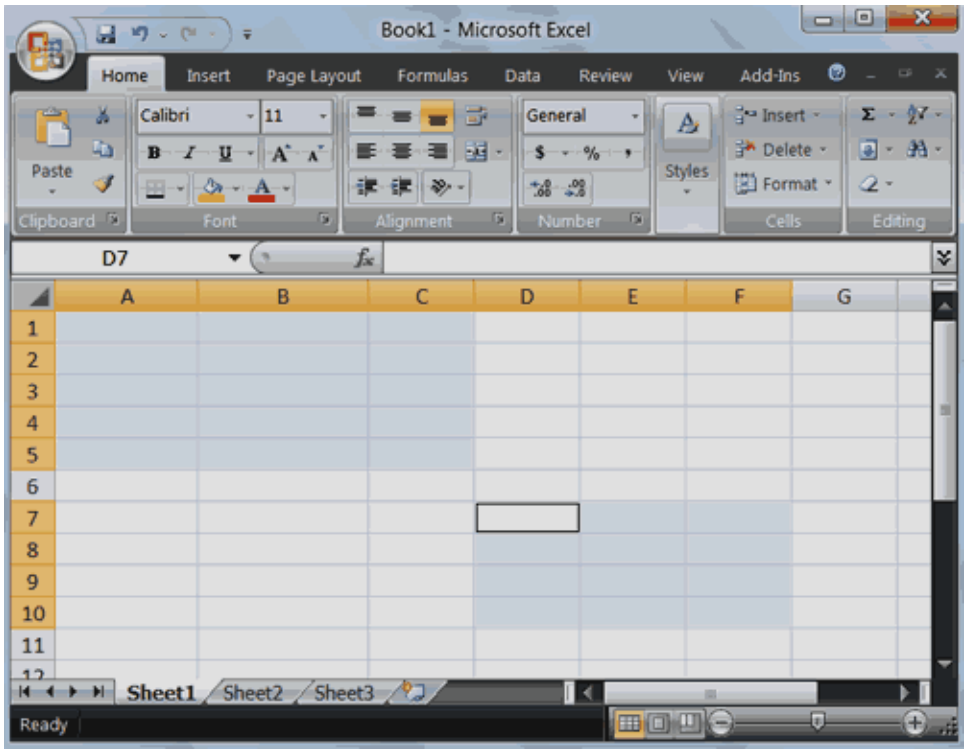
To select cells A1 to E1

1. Go to cell A1.
2. Press the F8 key. This anchors the cursor.
3. Note that "Extend Selection" appears on the Status bar in the lower-left corner of the window. You are in the Extend mode.
4. Click in cell E7. Excel highlights cells A1 to E7.
5. Press Esc and click anywhere on the worksheet to clear the highlighting.

Method 2

Select Cells by Dragging

- You can also select an area by holding down the left mouse button and dragging the mouse over the area.
- In addition, you can select non Contiguous areas of the worksheet by doing the following:



Fig

1. Go to cell A1.
2. Hold down the Ctrl key. You won't release it until step 9. Holding down the Ctrl key enables you to select noncontiguous areas of the worksheet.
3. Press the left mouse button.
4. While holding down the left mouse button, use the mouse to move from cell A1 to C5.
5. Continue to hold down the Ctrl key, but release the left mouse button.
6. Using the mouse, place the cursor in cell D7.
7. Press the left mouse button.
8. While holding down the left mouse button, move to cell F10. Release the left mouse button.
9. Release the Ctrl key. Cells A1 to C5 and cells D7 to F10 are selected.
10. Press Esc and click anywhere on the worksheet to remove the highlighting.

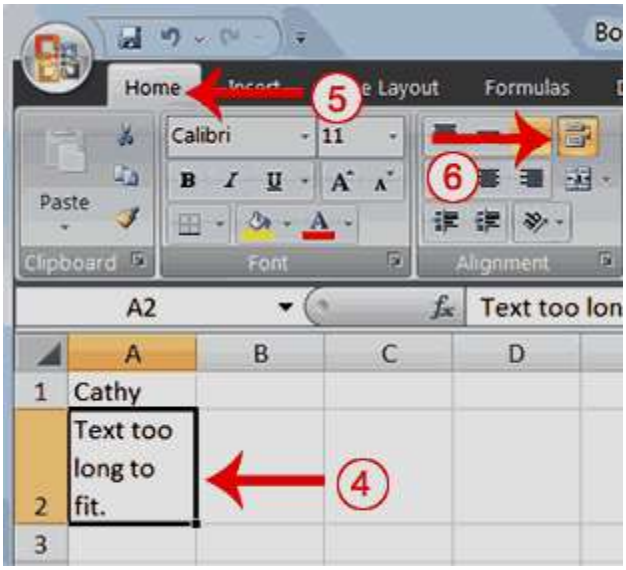
4.2.12.11 Wrap Text

When you type text that is too long to fit in the cell, the text overlaps the next cell. If you do not want it to overlap the next cell, you can wrap the text.

Wrap Text

Fig

1. Move to cell A2.
2. Type **Text too long to fit**.
3. Press Enter.



Fig

4. Return to cell A2.
5. Choose the Home tab.
6. Click the Wrap Text button . Excel wraps the text in the cell.

4.2.13 IMPORTANT DEFINITIONS

(i) **Cell:** Intersection of Row and Column is called cell.

(ii) **Cell Address or Cell name:** It is the combination of the column name and row number i.e. a cell formed by the intersection of column B and row 5 will be B5.

(iii) **Active cell:** The cell that has highlighted thick border around it is called active cell.

When worksheet opens, the cell displayed has row/and column A1. It is active or current cell.

(iv) **Cell Pointer:** The Thicker border area that moves from one cell to another is called cell pointer. It works like a cursor. You can enter the information, in a particular cell where the cell pointer is.

(v) **Work Book:** It is a file where data is stored. It consists of many worksheet.

Example. As the folder contains many files work book contains very worksheet. Hence folder is workbook and files are worksheets.

(vi) **Work sheet:** It is a page in a workbook where actual data can be entered, the current sheet is always highlighted in the sheet tab.

4.2.13.1 Reference

A reference identifies a cell or a range of cells on a worksheet and tell Microsoft excel, about where to look for the value or data that you want to use in the formula. We can refer to a cell or range of cell in formula in three ways.

4.2.13.2 Relative Reference

It is a default addressing used by Excel. When you create a formula using relative reference. Reference to cells or ranges are usually based upon their position relative to the cell that contains the formula. Example The Cell J2 contains a formula

J2 = H2 * I2

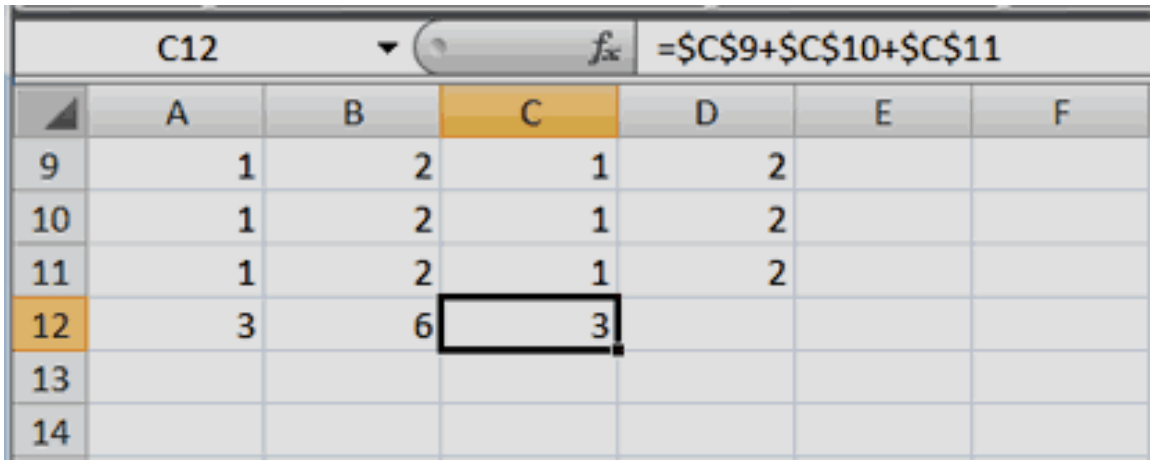
This formula is using relative reference; so the formula in the cell J3 will be = H3 * I3 and so on. This is due to relative reference. Each cell having the formula, store the information boot the cells being used in the formula and update this information relatively when you copy the formula.

4.2.13.3 Absolute Reference

When you don't have a series of the data corresponding to the formulae. It refers to a specific cell or cells. It is useful when you want to refer the data in a specific cell, rather than allowing you reference to change based on column or row.

Example. If you want to calculate the percentage of every student. The student marks can change but formula to calculate is same.

You can make a column, row or cell absolute by placing ($) dollar sign before the reference like $A$4, $3$2 it makes the cell A4 and S2 Absolute.



Fig

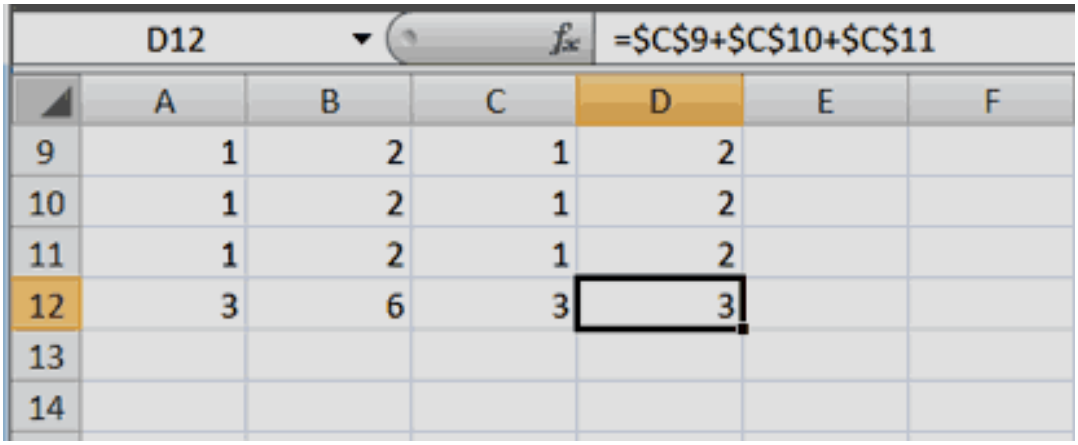
4.2.13.4 Mixed Reference

Combination of absolute and relative reference is called Mixed reference.

Example: If you want the row changed but the column to remain the same or vice versa then you use the mixed Reference. Examples of Mixed reference are $A1, $B3, A$2, B$3

To understand this concept let us take a practical Example Suppose in a cell K2 the formula is = J2 * J11 has been applied. The cell J11 contains 10% that is the sale tax percentage, when you drag the formula to cell K3, it becomes = J3 * J12 due to relative reference. But there is no value in J12. Hence no value will be displayed when you drag this formula of cell K2. If we write the formula is absolute reference like.

K2 = $J$2 * $J$12



Fig

This will gives you the same result in K3, K4 ..... and other cells which is not needed

This problem can be solved by using the mixed reference.

Like K2 is = J2 * $J$11

When you drag this formula it will change J2 and J3 but $J$11 will remain same or constant

4.2.14 TEST YOUR UNDERSTANDING (A)

1. Explain Cell range with Example.

……

……

2. Difference between Relative and Absolute cell reference.

……..…

……

3. Fill in the Blanks
   a. Cell address is a combination-------and ----------.
   b. Intersection of row and column ---------.
   c. Thicker border area that moves from one cell to another is ----------
   d. To save the command with different name the button that is used is--------.

4. 2.15 Review Question

1. What is Excel Workbook and Explain methods of creating and saving workbook?
2. What is Excel Spreadsheet and write the method of renaming and moving spreadsheet?
3. Differentiate between cell address and cell range ?
4. Explain following operations in Excel cells and define the following:

(i)	Copying Data	(ii)	Moving Data
(iii)	Deleting Data	(iv)	Mixed Reference
(v)	Worksheet	(vi)	Work Book
(vii)	Reference	(viii)	Cell
(ix)	Active Cell	(x)	Cell Pointer

5. What is drag and drop in Excel worksheet ?

Answer Key 4.2.14

1. Row Number, Column Number	2. Cell	3. Cell Pointer	4.Save As	

UNIT5

APPLICATION OF COMPUTER IN FINACIAL ACC0UNTING: GRAPHS & CHARTS - I

STRUCTURE

5.1 INTRODUCTION

Accounting software is used to implement a computerized accounting system. The computer accounting system is based on the concept of databases. It does away with the concept of creating and maintaining journals, ledger, etc. which are essential while working with manual accounting system. A computerized accounting system is an accounting information system that processes the financial transactions and events as per Generally Accepted Accounting Principles (GAAP) to produce reports as per user requirements. Every accounting system, manual or computerized, has two aspects. First, it has to work under a set of well-defined concepts called accounting principles. Another, that there is a user -defined framework for maintenance of records and generation of reports. In a computerized accounting system, the framework of storage and processing of data is called operating environment that consists of hardware as well as software in which the accounting system, works. The type of the accounting system used determines the operating environment. Both hardware and software are interdependent. The type of software determines the structure of the hardware. Further, the selection of hardware is dependent upon various factors such as the number of users, level of secrecy and the nature of various activities of functional

departments in an organization. All the interested users of financial statement can easily track all accounting reports if it is in connected computers. That is the reason, today, all accounting departments make accounts in computer. To better understand the financial accounting statement the graphical representation of data is used in computers. For this the Excel charts are used for the graphical representations of numeric data. Graphs make it easier for users to compare and understand numbers, so charts have become a popular way to present numerical data. Every chart tells a story. Stories can be simple: "See how our sales have increased" or complex: "This is how our overhead costs relate to the price of our product." Whether simple or complex, the story should be readily understandable. If you can't immediately understand what a chart means, then it isn't a good chart. Graphs are constructed with data points, which are the individual number in a worksheet, and data series, which are the groups of related data points within a column or row.

5.2 UNDERSTANDING FINANCIAL GRAPHS

Financial graphs and charts are visual tools that allow companies to monitor various performance metrics in areas such as liquidity, budgets, expenses, cash flow, and others. By doing so, they can successfully manage risks to ensure healthy finances and steady growth. To ensure the best possible performance for a company, conducting regular financial analytics and ensuring the highest quality of data management must be the top priorities of companies no matter the size. If the finance department raises an alarm, everyone must carefully listen because it concerns the most crucial information and can lead to serious damages if ignored. That's why financial charts need to be created with the utmost care and attention. As humans, we respond to, and process the visual data better than anything else. When it comes to digesting and taking action upon vital financial metrics and insights, well-designed finance graphs and charts offer the best solution. With the help of graphs

- One will be able to track the liquidity, cash flow, budgets, and expenses accurately with ease, visually, and automate processes that were oftentimes done manually and with higher risks of errors.
- By setting the right financial KPIs for the business, you will be able to set valuable goals that result in growth and success. While there are numerous charts out there, we will explain the invaluable ones for any business.
- You will be able to make sense of all the financial information and metrics as they will be split into actionable categories and presented in an intuitive, scan able fashion, no matter the metric you need to include and analyse.

Financial Graph Dashboard

5.3 Graphs and Charts

Excel comes with a wide variety of charts capable of graphically representing most standard types of data analysis, and even some more exotic numeric interpolations. The type of data you are using and presenting determines the type of chart you will plot the data on. This chapter discusses some of the most frequently used chart types. Excel has graphs in the following categories:

Pie charts: These work best for displaying how much each part contributes to a total value. Pie charts can be exploded for greater visual clarity, or turned into doughnut charts, which can represent more than just one set of data.

Line and area charts: These show data points connected with lines, indicating upward or downward trends in value. Area charts show the area below a line filled in. Both types can be combined with column charts to show more data.

Column and bar charts: These compare values across categories, with results presented vertically in column charts and horizontally in bar charts, The composition of the

column or bar can be stacked in more than one color to represent the contribution of each portion of a category's data to the total for that category.

Special charts: Excel includes a number of charts suitable for presenting scientific statistical, and financial data. Scatter charts are used to present experimental results. Surface and cone charts are good for presenting 3-D and 2-D changes in data. Radar charts show data values in relation to a single metric. Stock charts present values for between three and five series of data, including open, high, low, close, and volume trading information.

5.3.1 Pie Charts

Use pie charts to show the relationships between pieces of an entity. The implication is that the pie includes all or something. The pie chart isn't appropriate for illustrating some of anything, so if there's not an obvious "all" in the data you're charting, don't use a pie.

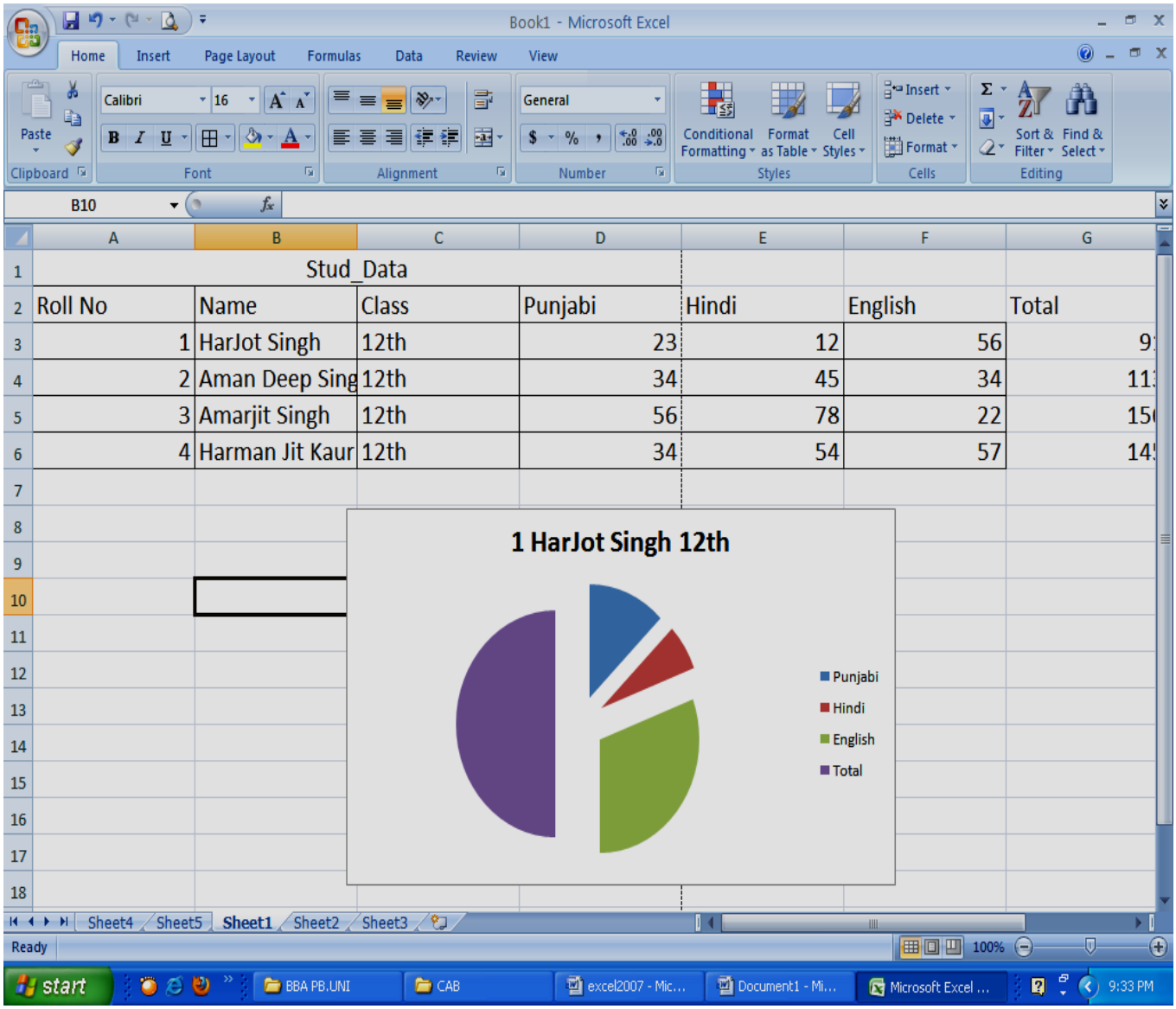


Fig.

A pie chart can only include one data series. If you select more than one data, series, Excel uses the first series and ignores all others. No error message appears, so you won't

necessarily know that the chart doesn't show the data you intended to include, unless you examine the chart carefully.

When you create a pie chart, Excel totals the data points in the series and then divides the value of each data point into the series total to determine how large each data point's pie slice should be. Don't include a total from the worksheet as a data point; this doubles the total Excel calculates, resulting in a pie chart with one large slice (50 percent of the pie).

5.3.2 Series Charts

In a series chart, you can chart more than one data series. This lets you compare the data points in the series, such as January vs. February, or Reno vs. Phoenix. Series charts are open-ended; there is no requirement that the data shown is all the data for a month or year. There are several types of series charts. You can give the same set of data a very different look by simply changing the chart type.

5.3.3 Line and Area Charts

The series chart shown in figure is a line chart. In a 2-D version (as shown) or in a 3-D version that is sometimes called a ribbon chart. An area chart is a line chart with the area below the line filled. Line charts and area charts are typically used to show one or more variables (such as sales, income, or price) changing over time.

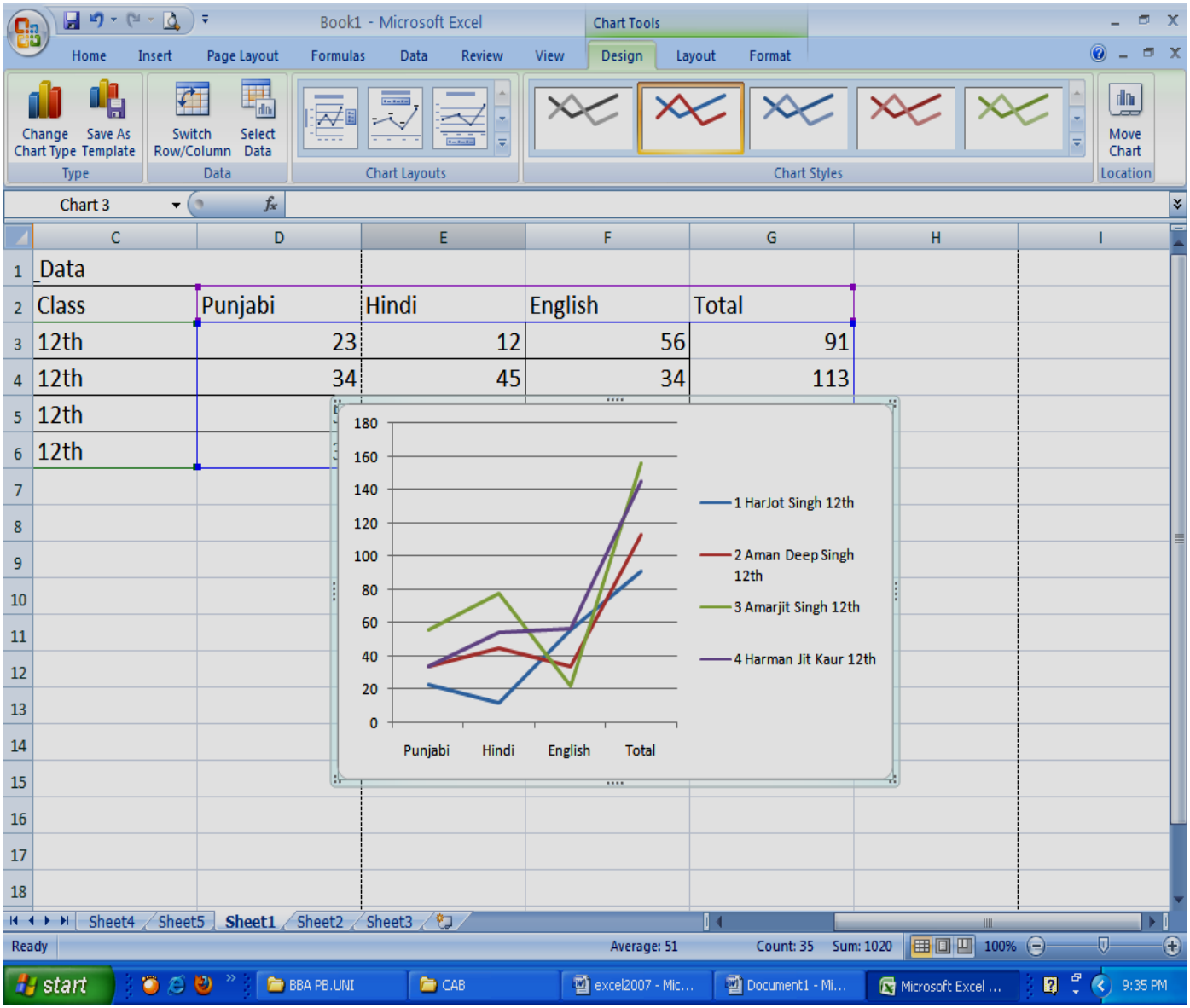


Fig.

5.3.4 Column Chart

Figure shows the same information presented as a bar chart. The bars give added substance to the chart. In the line chart, what the reader notices is the trend up or down in each line and the gaps between the lines.

Line and area charts share a common layout. The horizontal line is called the X-axis, and the vertical line is the Y-axis (the same x- and y-axis you may have learned about in algebra or geometry class when plotting data points). In a bar chart, however, the axis are turned 90 degrees so that the x-axis is on the left side.

Excel can also combine columns with line or area charts and embellish line or column charts with 3-D effects. You can make the columns and lines on your charts into tubes, pyramids, cones, or cylinders; or transform regular bars into floating 3-D bars. Plotting data on two axis is also possible with column charts.

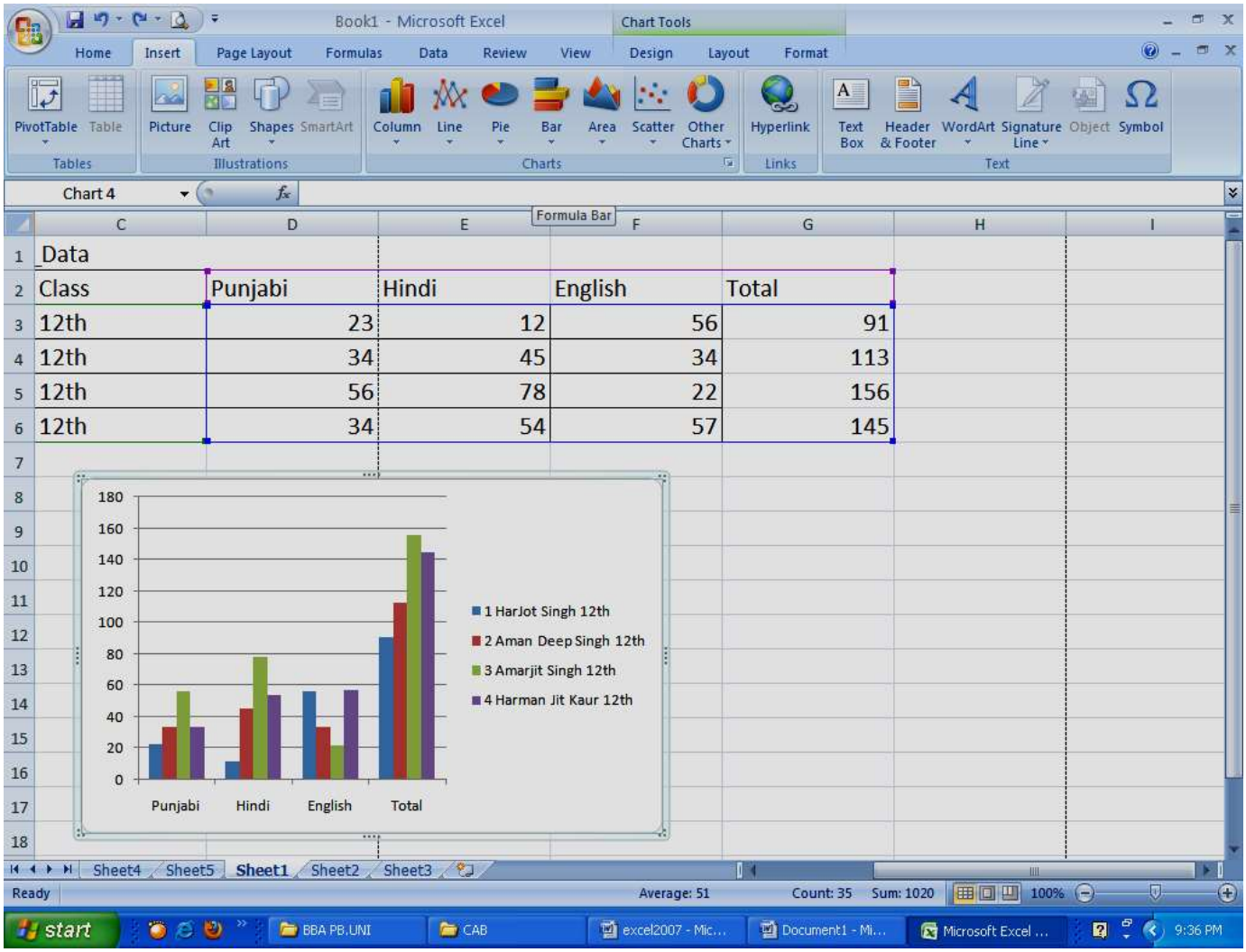


Fig.

5.3.5 Bar Chart Variations

Column charts are the same as bar charts, but with the X-axis at the bottom. There are three-dimensional varieties of bar and column charts, which add depth to the regular chart. Cylinders, cones, and pyramids are variations of a column chart.

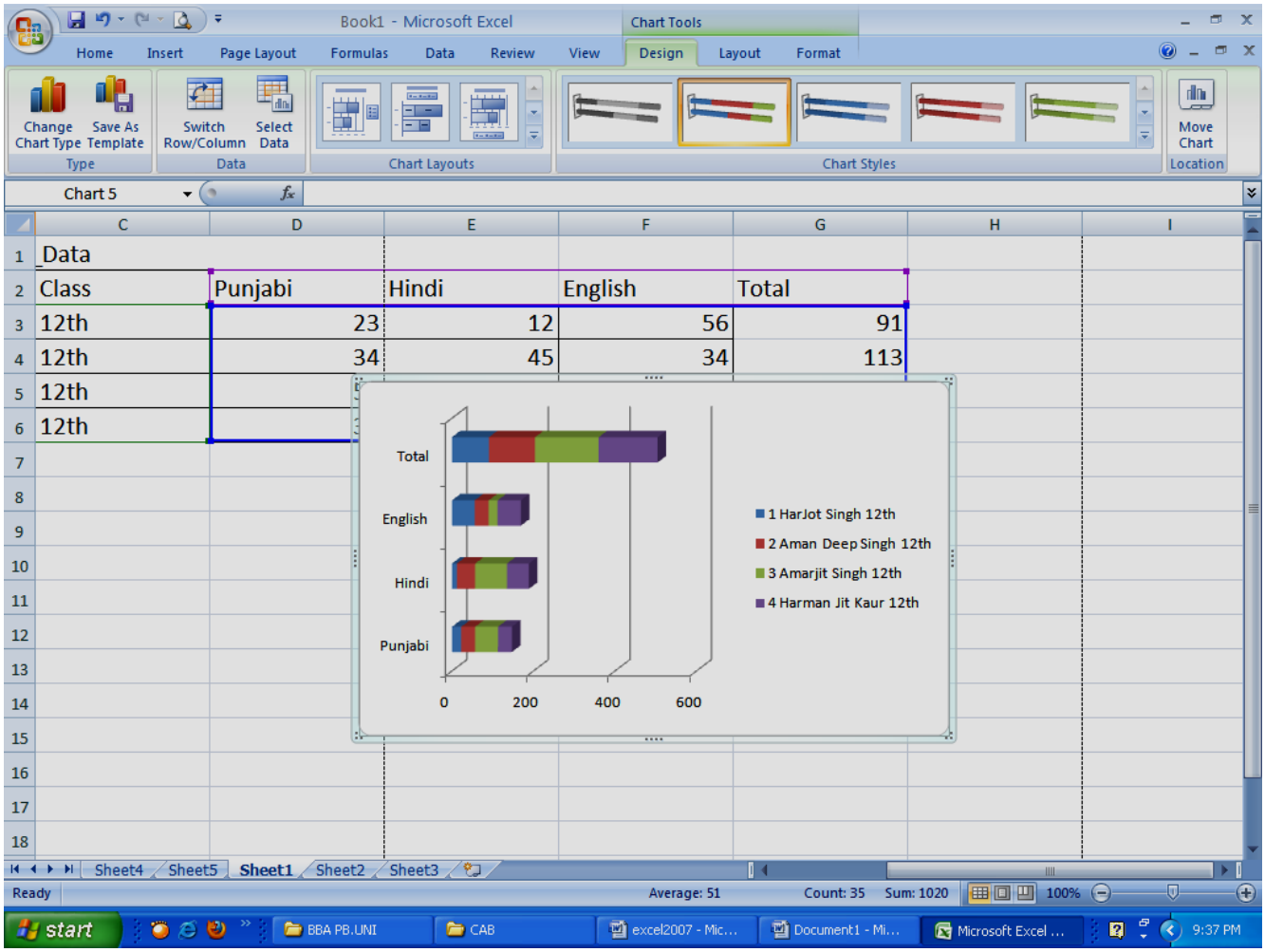


Fig.

Excel also offers another style of bar and column chart–the stacked chart. A stacked 3-D column chart, using the same data as Figure. In a stacked chart, parallel data points in each data series are stacked on top or to the right of each other. Stacking adds another dimension to the chart, since it allows the user to compare sales between as well as within time periods-like providing a column chart and a pie chart for each time·period.

The 3-D charts have three axis. In a 3-D column chart, the X-axis is on the bottom. The vertical axis is the Z-axis; the Y-axis goes from front to back, providing the "third dimension" of depth in the chart. Don't worry about memorizing which axis is which in each chart type; there are ways to know which is which when you're creating or editing the chart.

5.4 APPLY A CHART LAYOUT

Context tabs are tabs that only appear when you need them. Called Chart Tools, there are three chart context tabs: Design, Layout, and Format. The tabs become available when you create a new chart or when you click on a chart. You can use these tabs to customize your chart.

You can determine what your chart displays by choosing a layout. For example, the layout you choose determines whether your chart displays a title, where the title displays,

whether your chart has a legend, where the legend displays, whether the chart has axis labels and so on. Excel provides several layouts from which you can choose.

Steps to Apply a Chart Layout

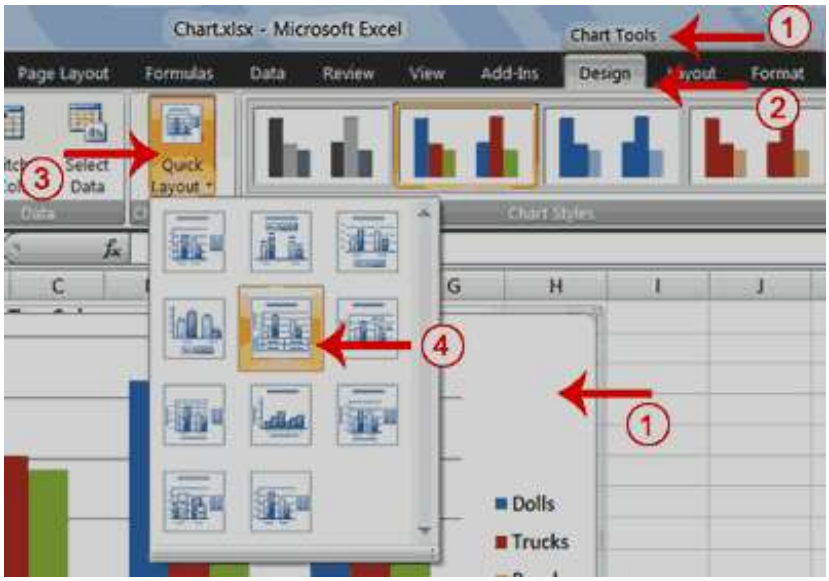


Fig 11.5

1. Click your chart. The Chart Tools become available.
2. Choose the Design tab.
3. Click the Quick Layout button in the Chart Layout group. A list of chart layouts appears.
4. Click Layout 5. Excel applies the layout to your chart.

5.5 ADD LABELS

When you apply a layout, Excel may create areas where you can insert labels. You use labels to give your chart a title or to label your axes. When you applied layout 5, Excel created label areas for a title and for the vertical axis.

Steps to add labels

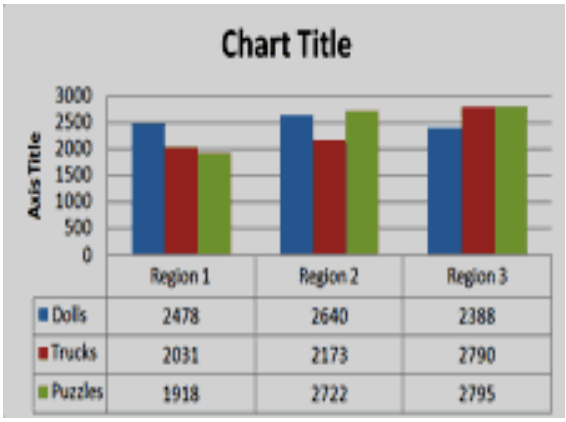


Fig Before

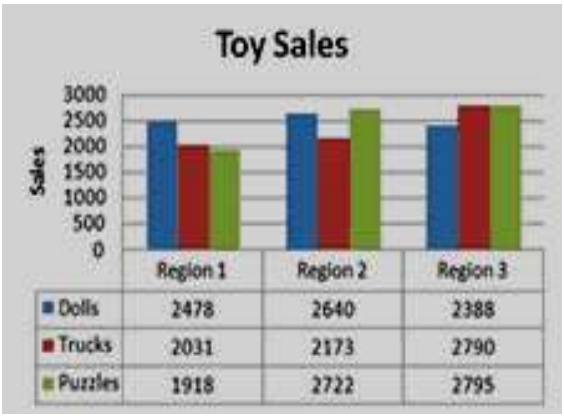


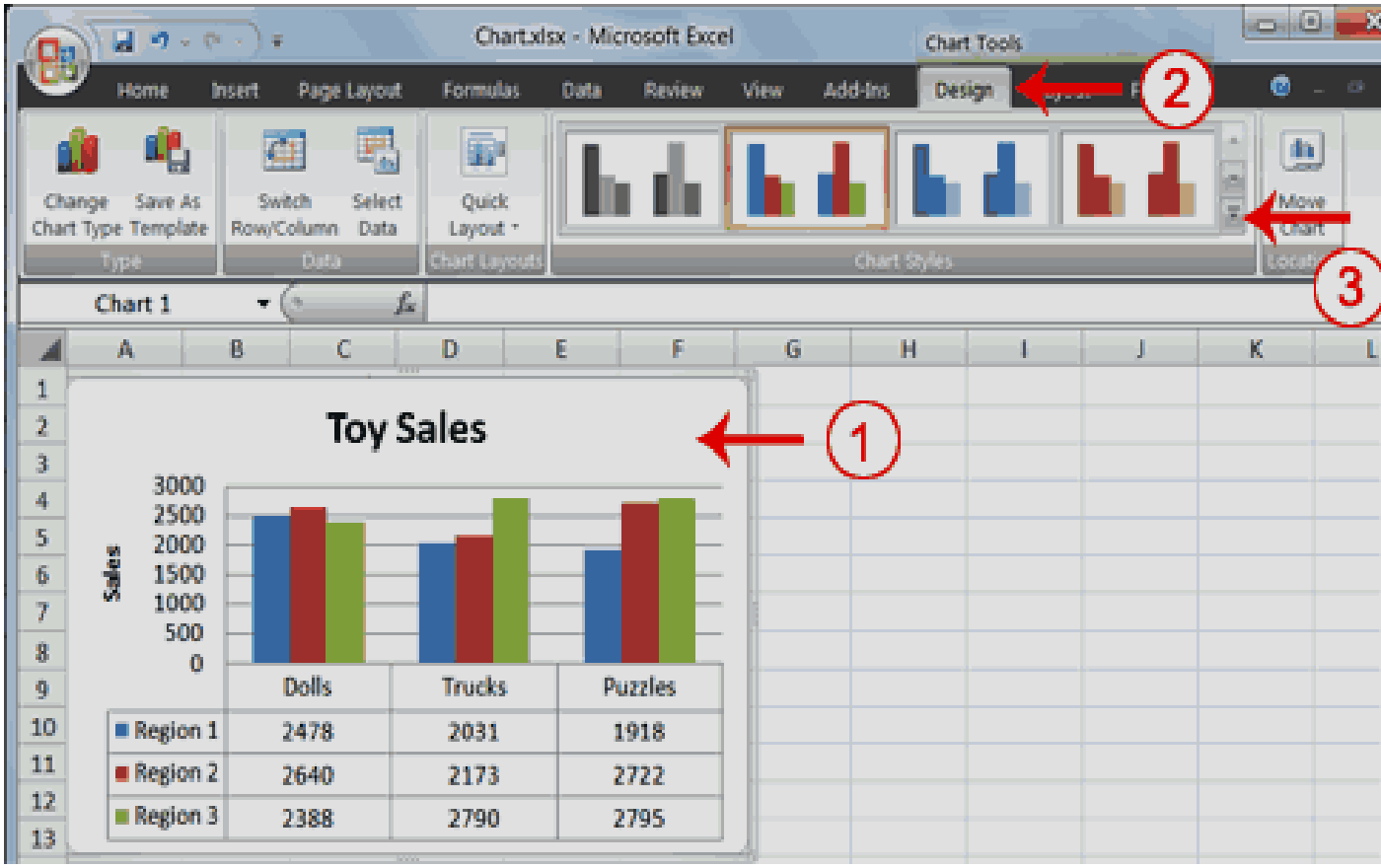
Fig After

1. Select Chart Title. Click on Chart Title and then place your cursor before the C in Chart and hold down the Shift key while you use the right arrow key to highlight the words Chart Title.
2. Type **Toy Sales**. Excel adds your title.
3. Select Axis Title. Click on Axis Title. Place your cursor before the A in Axis. Hold down the Shift key while you use the right arrow key to highlight the words Axis Title.
4. Type **Sales.** Excel labels the axis.
5. Click anywhere on the chart to end your entry.

5.6 CHANGE THE STYLE OF A CHART

A style is a set of formatting options. You can use a style to change the color and format of your chart. Excel 2007 has several predefined styles that you can use. They are numbered from left to right, starting with 1, which is located in the upper-left corner.

Steps to change the Style of a Chart



Fig

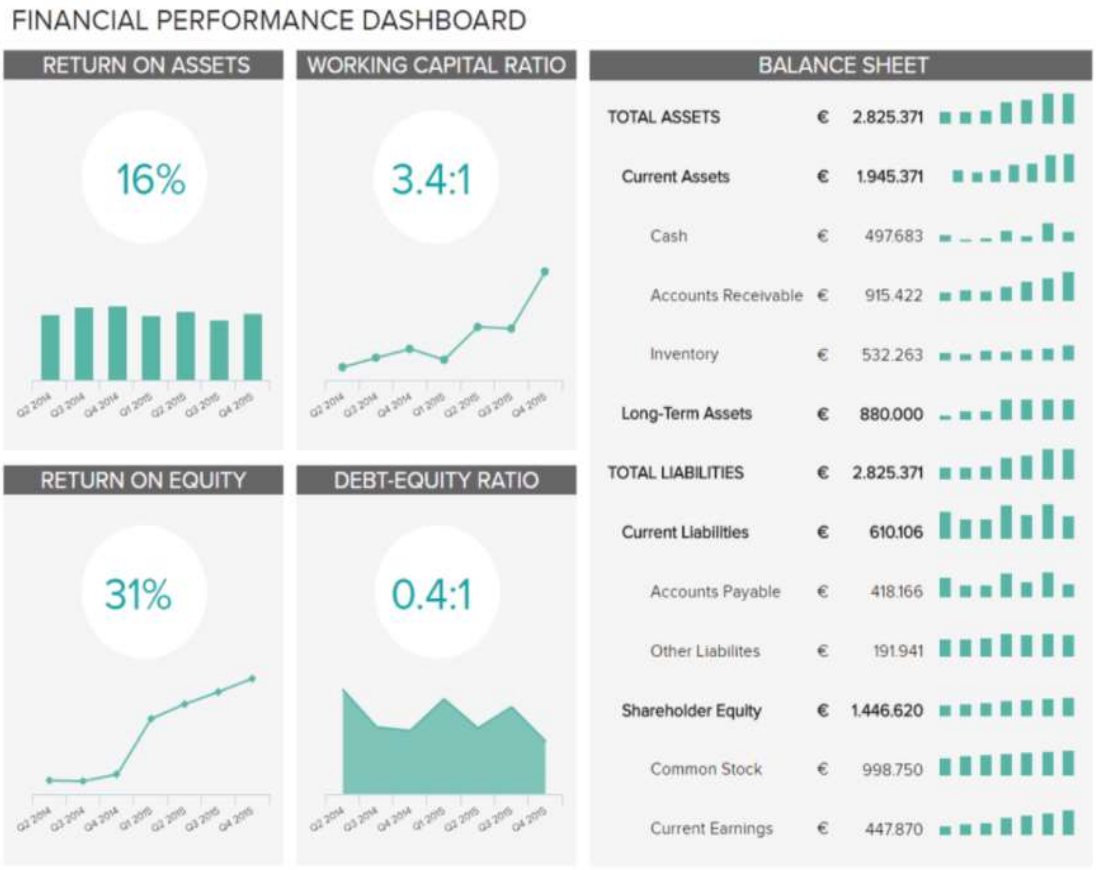
1. Click your chart. The Chart Tools become available.
2. Choose the Design tab.
3. Click the More button in the Chart Styles group. The chart styles appear.

Fig

4. Click Style 42. Excel applies the style to your chart.

5.7 Financial Data Visualization Using Graphs and Charts

In the present scenario business will have the opportunity to explore, monitor, and access real-time data, but the interactivity levels are an invaluable resource for managing enormous amounts of information, especially in the financial sector where a small mistake can lead to millions of damages. That's why interaction with the finance charts and graphs is of utmost importance: a single KPI can be viewed in numerous useful ways and angles that static presentations could never offer. Finally, we cannot avoid mentioning collaboration as one of the top roles of modern financial data visualization tools. As we said before finances are arguable the most important aspect of any business, if something is wrong with them most likely all your company will suffer. By using dashboard tool such as data pine you will be able to share your financial insights live with the rest of the departments in your company and enhance a collaborative, data-driven work methodology that will optimize your business performance as a whole. Graph use in financial reports is already a business standard in today's environment. When you add up intelligent tools, automation, stunning visuals, and interactivity for your data visualization process, your finance department will significantly increase productivity, and decrease costs.



Some of the of Financial Accounting Graphs

1. GROSS PROFIT MARGIN GRAPH

As a key component of our profit & loss dashboard this indicator has been developed in the form of a traditional **pie-style chart** but with a more navigable design. The gross profit chart shows the overall revenue minus the cost of goods sold, divided by your total sales revenue.

2. Operating Profit Margin

As another profit and loss-centric financial chart, this visual is split into an easy-to-digest percentage gauge in addition to a **detailed bar chart** and will help you to accurately calculate your Earnings Before Interest and Tax (EBIT).

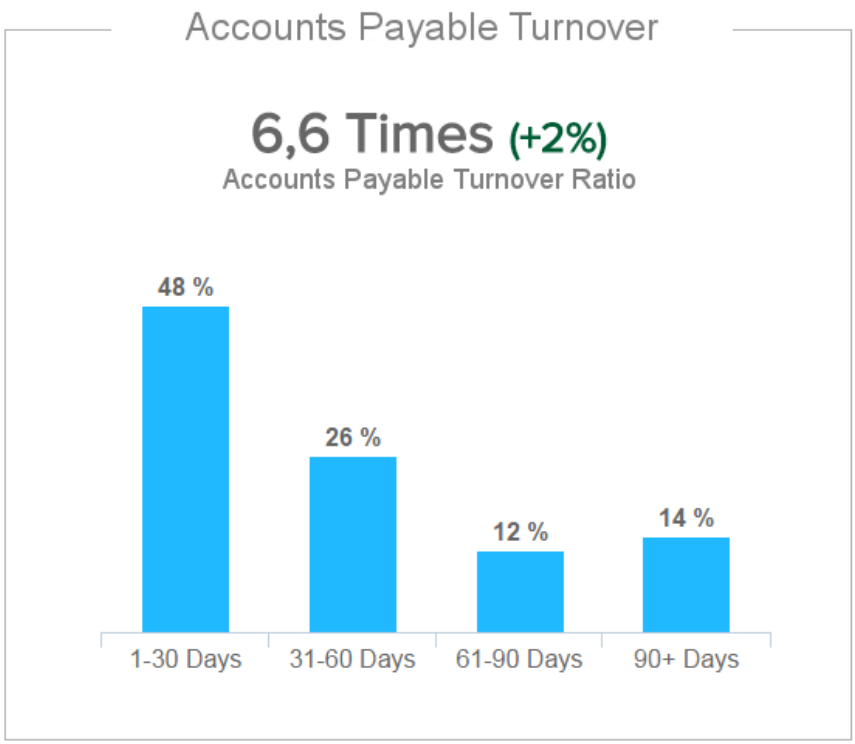
The higher your operating income, the more profitable your business will potentially be, and this chart will help this metric from dipping through a mix of historical data and priceless real-time insights.

3. **Operating Expense Ratio**

The operating expense ratio is also strongly related to the profit and loss area of your finance department's key activities, and this color-coded health gauge will help you gain access to the information you need, even at a quick glance.

The operating expense ratio (OER) will give you the power to understand the operational efficiency of your business by comparing your operating expenses to your overall revenue. This is the best visual to show profit and loss, but you do need to connect it with other charts to create a proper financial data story. By monitoring this information regularly, you will be able to decide whether your venture is scalable and make necessary changes to your commercial strategy if you feel it isn't.

4. **Accounts Payable Turnover Ratio**



Regarding the smooth and responsible handling of your company's cash management activities, the accounts payable turnover ratio is another liquidity calculation that will ensure that you are able to pay all of your important expenses within the required deadlines or set timeframes.

The ratio itself changes according to real-time shifts and is displayed in a bold numbered format, while historical or chronological information is presented in the form of a **column graph** that showcases turnover percentages, split into different periods of time. A higher ratio gives suppliers and creditors the assurance that your business pays its bills frequently and is a pivotal metric when negotiating a credit line with a supplier, so it's a chart your company cannot afford to live without.

5.8 TEST YOUR UNDERSTANDING (A)

1. Which type of chart is used for comparing the values over the category?

   ……

   ……

2. What steps will you take to insert a new chart in MS Excel?

   ……

   ……

5.9 **Review Questions**

1. Explain the Role of Excel in Financial Accounting.
2. What are 2D and 3D Graphs, how they are created?
3. Explain the following :

   (a) Line Chart (b) Bar Chart (c) Area Chart
4. What are :

   (i) Legends (ii) Data labels (iii) Gridlines
5. Explain Pie Charts how they created in Excel?
6. How graphs are created and printed in Excel?

UNIT: 6

APPLICATION OF COMPUTER IN FINACIAL ACC0UNTING: GRAPHS & CHART – II & III

STRUCTURE

6.1 INTRODUCTION

To set up financial analyses that are more sophisticated than just looking at transactions. One of the ways is by means of a pivot table. A pivot table is *the most powerful and flexible* method of data analysis and synthesis available in Excel. We are often confused with a high volume of data that probably has some interesting patterns in it — but there's so much detail that it's almost impossible to draw the conclusion.

6.2 Pivot Table

A PivotTable is an interactive way to quickly summarize large amounts of data. One can use a PivotTable to analyse numerical data in detail, and answer unanticipated questions about your data. PivotTable is a table of stats that summarizes the data as sums, averages, and many other statistical measures. Let us assume that we got data of any real estate project with different fields like type of flats, block names, area of the individual apartments, and their other cost per various services, etc.

A PivotTable is especially designed for:

- Querying large amounts of data in many user-friendly ways.

- Subtotalling and aggregating numeric data, summarizing data by categories and subcategories, and creating custom calculations and formulas.
- Expanding and collapsing levels of data to focus your results, and drilling down to details from the summary data for areas of interest to you.
- Moving rows to columns or columns to rows (or "pivoting") to see different summaries of the source data.
- Filtering, sorting, grouping, and conditionally formatting the most useful and interesting subset of data enabling you to focus on just the information you want.
- Presenting concise, attractive, and annotated online or printed reports.

6.2.1 Functions performed on the Pivot Table

After you create a PivotTable by selecting its data source, arranging fields in the PivotTable **Field List**, and choosing an initial layout, you can perform the following tasks as you work with a PivotTable:

1. **Explore the data**

- Expand and collapse data, and show the underlying details that pertain to the values.
- Sort, filter, and group fields and items.
- Change summary functions, and add custom calculations and formulas.

2. **Change the form layout and field arrangement**

- Change the PivotTable form: **Compact**, **Outline**, or **Tabular**.
- Add, rearrange, and remove fields.
- Change the order of fields or items.

3. **Change the layout of columns, rows, and subtotals**

- Turn column and row field headers on or off, or display or hide blank lines.
- Display subtotals above or below their rows.
- Adjust column widths on refresh.
- Move a column field to the row area or a row field to the column area.
- Merge or unmerge cells for outer row and column items.

4. **Change the display of blanks and errors**

- Change how errors and empty cells are displayed.
- Change how items and labels without data are shown.
- Display or hide blank rows

5. **Change the format**

- Manually and conditionally format cells and ranges.
- Change the overall PivotTable format style.
- Change the number format for fields.
- Include OLAP Server formatting.

6.2.2 Creating Pivot Table

You can use data from Excel worksheet as the basis for a PivotTable or PivotChart. The data should be in list format, with column labels in the first row, which Excel will use for **Field Names**. Each cell in subsequent rows should contain data appropriate to its column heading, and you shouldn't mix data types in the same column. For instance, you shouldn't mix currency values and dates in the same column. Additionally, there shouldn't be any blank rows or columns within the data range.

Excel tables Excel tables are already in list format and are good candidates for PivotTable source data. When you refresh the PivotTable, new and updated data from the Excel table is automatically included in the refresh operation.

Using a dynamic named range To make a PivotTable easier to update, you can create a dynamic named range and use that name as the PitTable's data source. If the named range expands to include more data, refreshing the PivotTable will include the new data.

Including totals Excel automatically creates subtotals and grand totals in a PivotTable. If the source data contains automatic subtotals and grand totals that you created by using the **Subtotals** command in the **Outline** group on the **Data** tab, use that same command to remove the subtotals and grand totals before you create the PivotTable.

For example, here's a simple list of household expenses on the left, and a PivotTable based on the list to the right:

Household expense data

	A	B	C
1	MONTH	CATEGORY	AMOUNT
2	January	Transportation	$74.00
3	January	Grocery	$235.00
4	January	Household	$175.00
5	January	Entertainment	$100.00
6	February	Transportation	$115.00
7	February	Grocery	$240.00
8	February	Household	$225.00
9	February	Entertainment	$125.00
10	March	Transportation	$90.00
11	March	Grocery	$260.00
12	March	Household	$200.00
13	March	Entertainment	$120.00

Corresponding PivotTable

AMOUNT	MONTH			
CATEGORY	January	February	March	Grand Total
Entertainment	$100	$125	$120	$345
Grocery	$235	$240	$260	$735
Household	$175	$225	$200	$600
Transportation	$74	$115	$90	$279
Grand Total	$584	$705	$670	$1,959

After you create a PivotTable by selecting its data source, arranging fields in the PivotTable

Below is the raw data for the PivotTable.

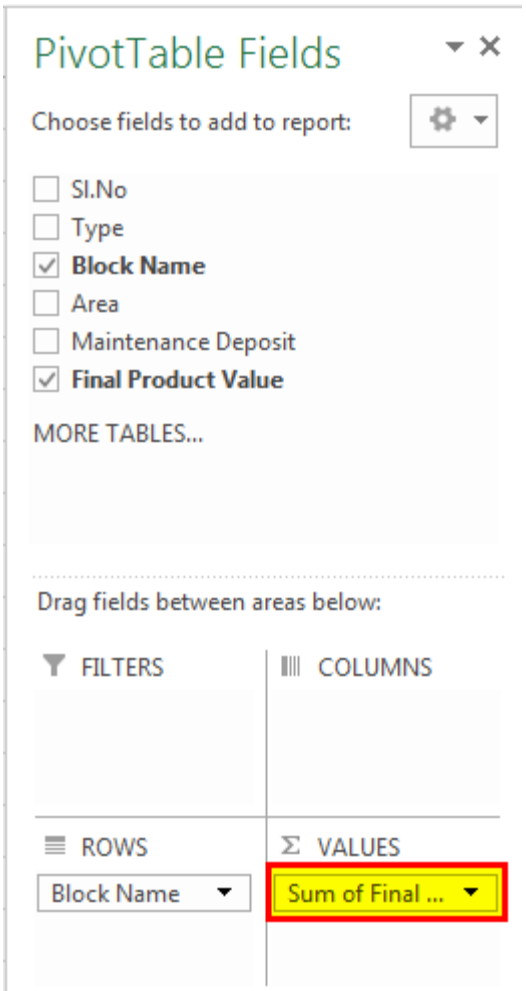
	A	B	C	D	E	F
1	Sl.No	Type	Block Name	Area	Maintenance Deposit	Final Product Value
2	1	B4	Mickey	2,589.62	258,962	24,545,068
3	2	B2a	Rainbow	2,531.09	253,109	25,572,452
4	3	A2a	Rainbow	3,341.12	334,112	33,559,029
5	4	A2a	Cheeku	3,341.12	334,112	31,447,779
6	5	C2	Mickey	2,501.98	250,198	23,941,476
7	6	B2a	Cheeku	2,531.09	253,109	23,378,552
8	7	B2a	Strawberry	2,531.09	253,109	23,876,492
9	8	A2a	Strawberry	3,341.12	334,112	36,421,719
10	9	A1	Cheeku	3,365.21	336,521	30,785,575
11	10	A1	Rainbow	3,365.21	336,521	30,142,645
12	11	A1	Strawberry	3,365.21	336,521	30,142,645
13	12	A1	Donald	3,365.21	336,521	30,142,645
14	13	B1	Cheeku	2,546.79	254,679	22,922,834
15	14	B1	Rainbow	2,546.79	254,679	22,922,834
16	15	B1	Strawberry	2,546.79	254,679	22,922,834
17	16	B1	Mickey	2,546.79	254,679	23,843,144
18	17	C1b	Cheeku	2,330.07	233,007	22,307,235
19	18	C1a	Strawberry	2,341.96	234,196	21,562,732
20	19	C1a	Donald	2,341.96	234,196	21,562,732
21	20	C1a	Rainbow	2,341.96	234,196	21,562,732
22	21	C1a	Strawberry	2,341.96	234,196	21,562,732

6.2.2.1 Performing Statistics Measures in Pivot Table

1.SUM:

In the Excel Pivot Table Example, we should perform the sum of the final product value to extract the value of different blocks got as below:

Drag the “Block Name” to “Rows” and “Sum of Final Product Value” to “Values” Fields.



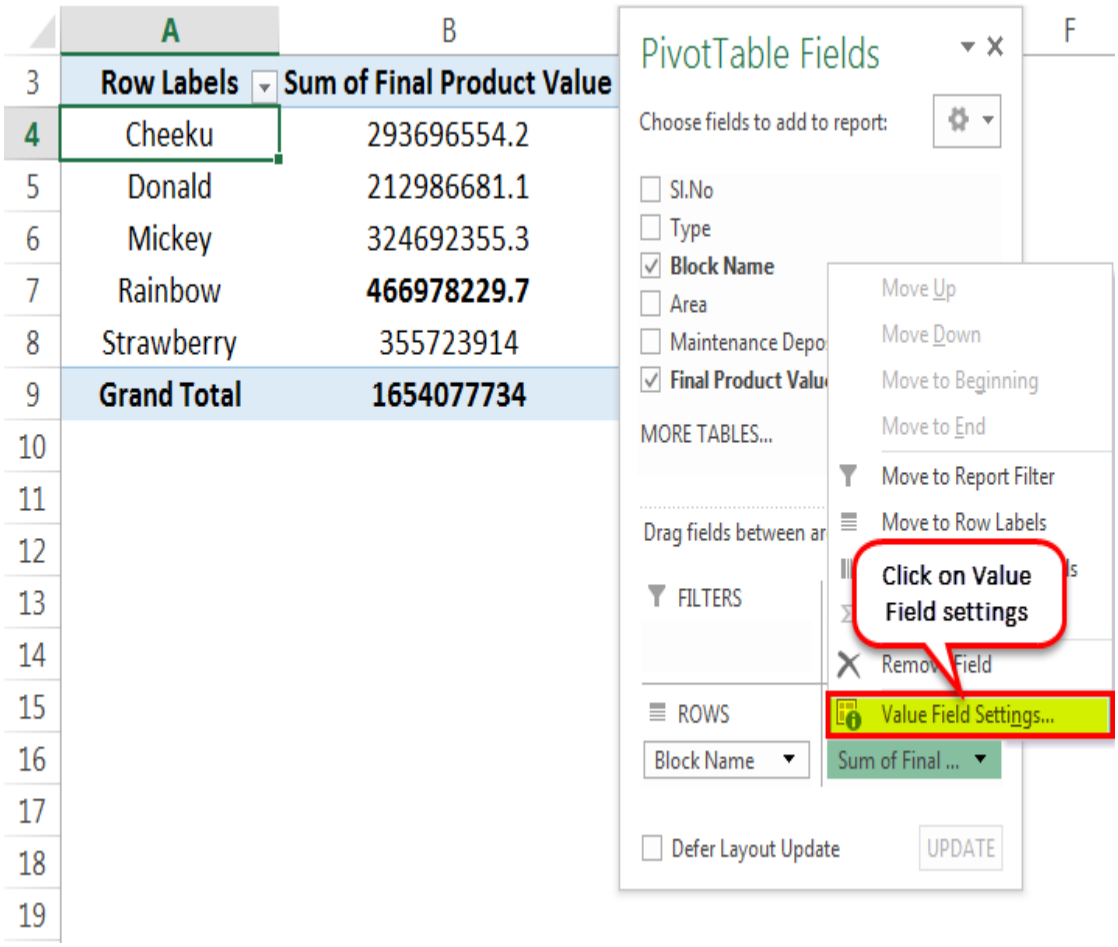
	A	B
3	**Row Labels**	**Sum of Final Product Value**
4	Cheeku	293696554.2
5	Donald	212986681.1
6	Mickey	324692355.3
7	Rainbow	**466978229.7**
8	Strawberry	355723914
9	**Grand Total**	**1654077734**
10		

It shows that we have the “Cheeku” block with 293 million, “Donald” block with 212 million, “Mickey” block with 324 million, “Rainbow” block with 466 million, and “Strawberry” with 355 million. This table shows us that the “Rainbow” block got a higher value than the other blocks.

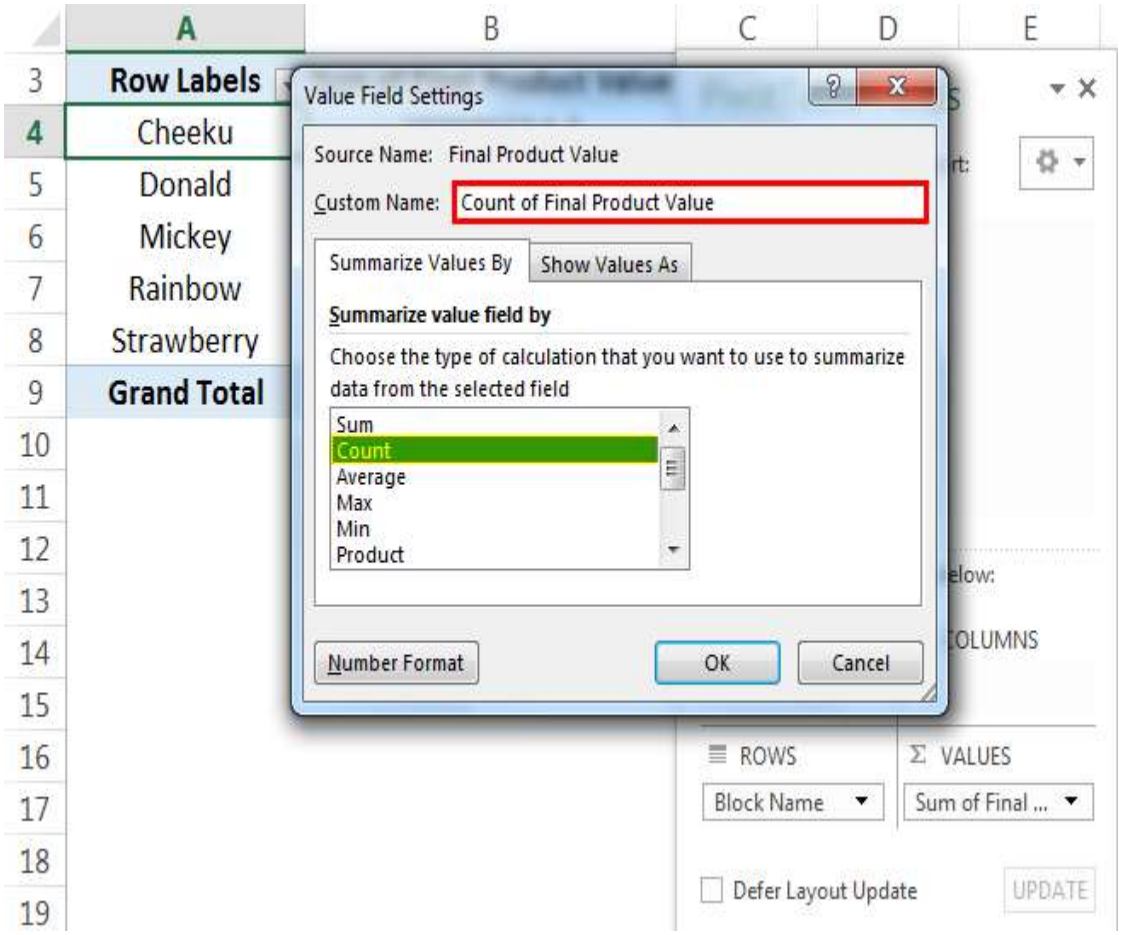
2. COUNT:

Let us count the number of flats for different blocks by changing the value field settings in Excel PivotTable to count as below:

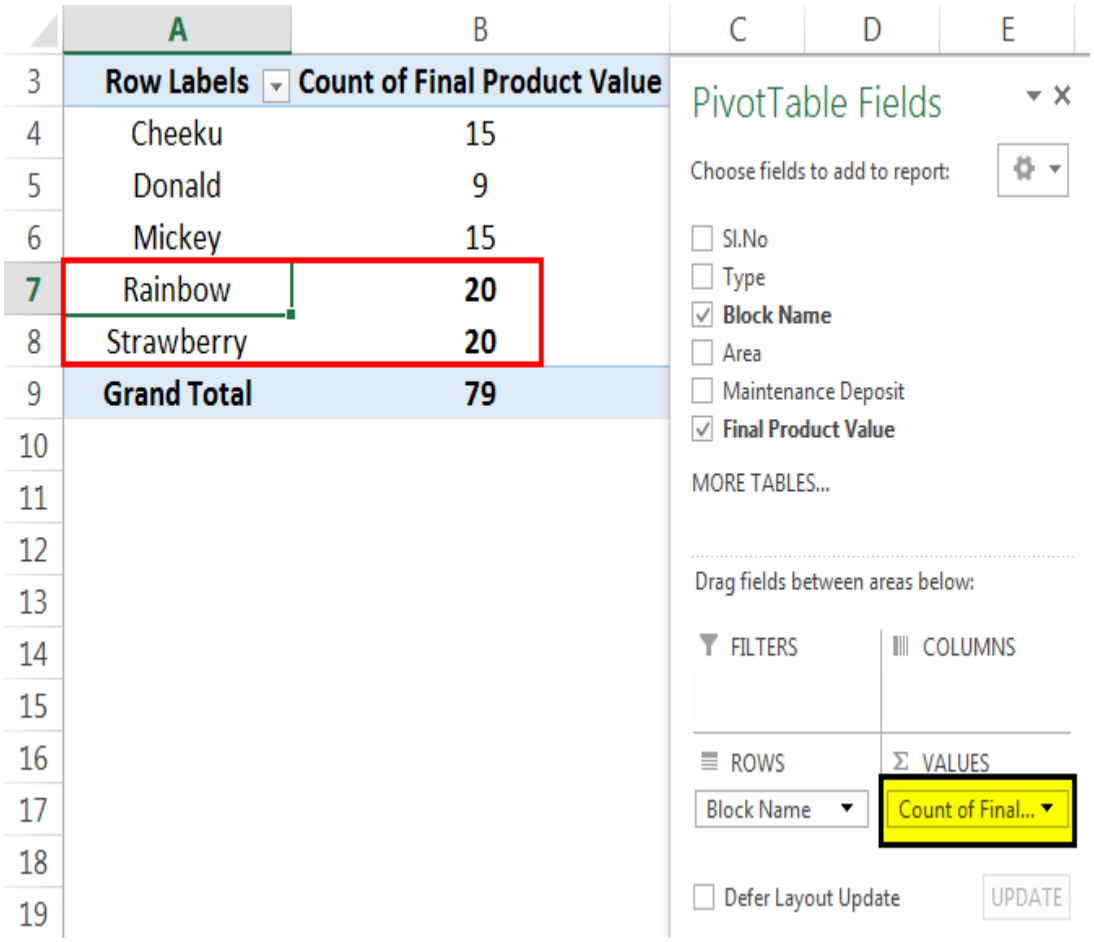
Then, click on “Value Field Settings.”



A dialog box appears. Select “Count” from “Summarize value field by.”



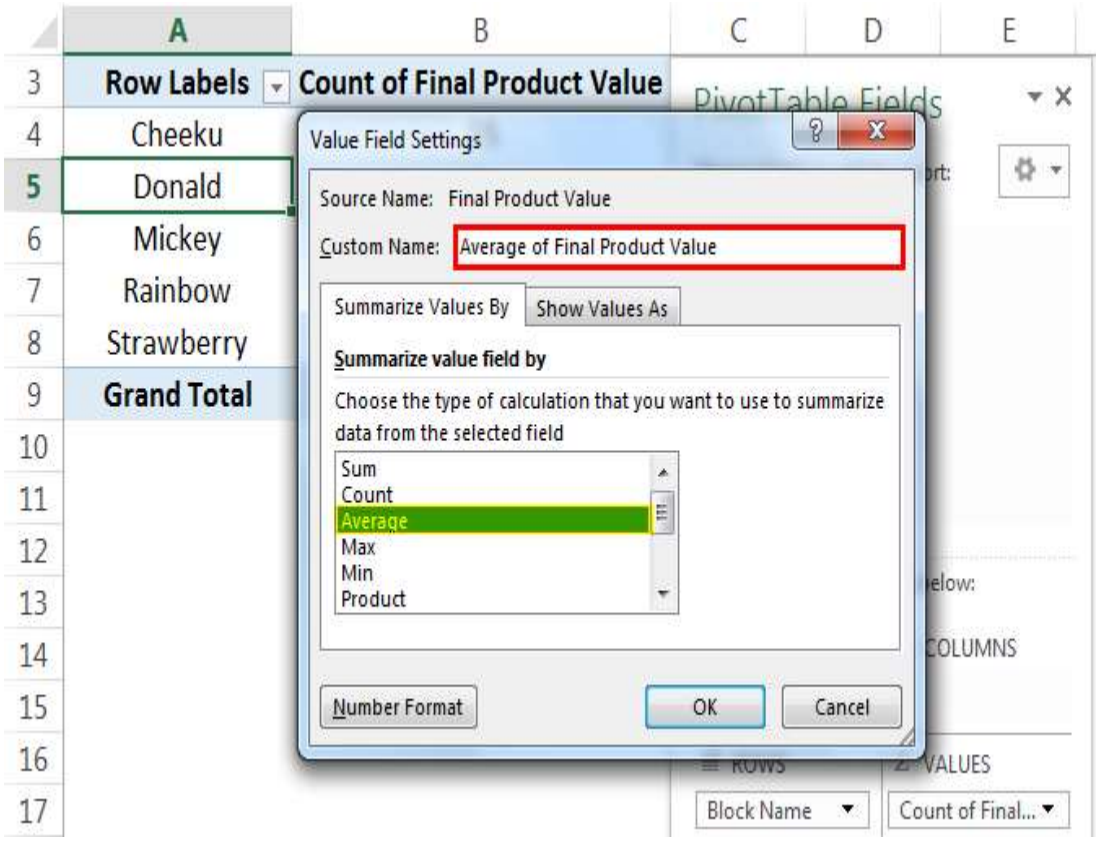
Then the PivotTable looks like as given below:



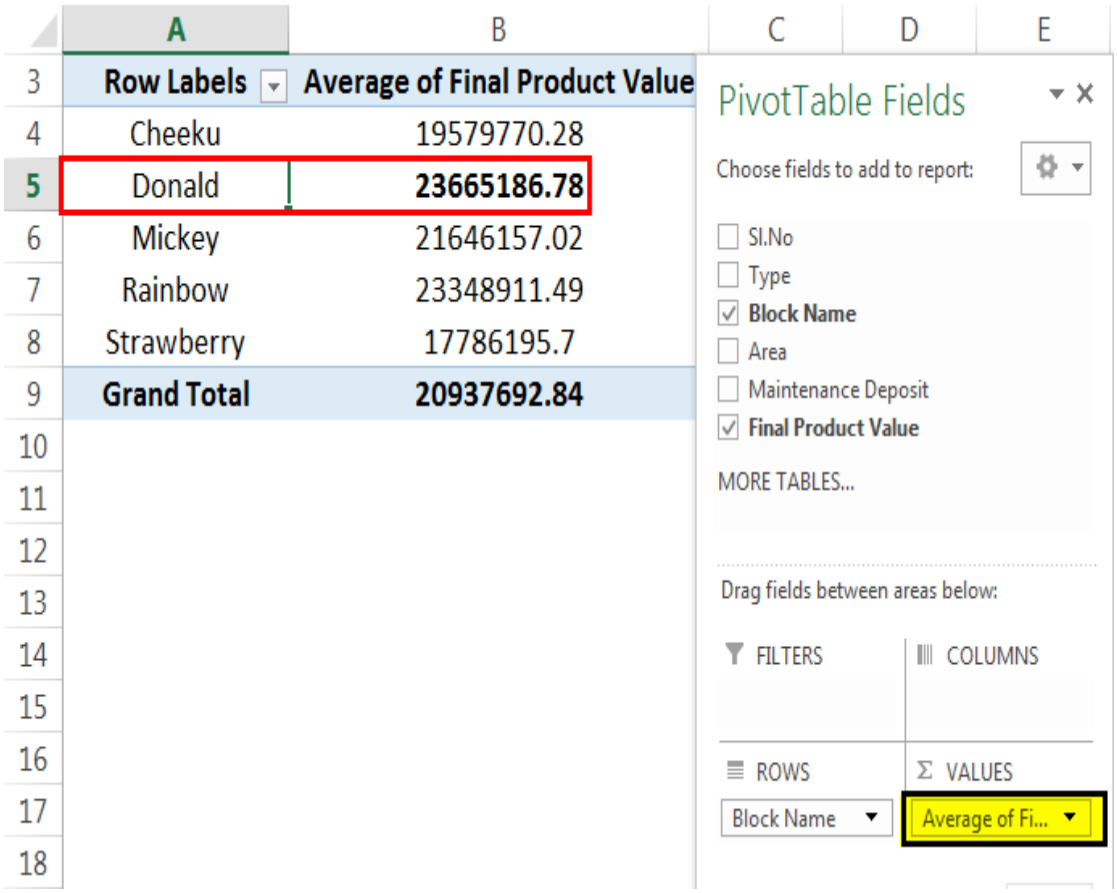
From the above tables, we can see how to change the field settings to count. Here, we can note that we got the highest number of flats in the "Rainbow" block and "Strawberry" block compared to other blocks. In total, we got 79 flats in this project.

3. AVERAGE:

In the PivotTable practice exercise example, we will find out the average price of the flat in each block by changing the value field settings from "Count" to "Average."



Then, PivotTable changes from "Count" to "Average," as given below:



From the above PivotTable example, we can see that we got the average flat price in each block. The “Donald” block got the highest average flat price among other blocks.

Similarly, we can perform other statistical measures like **Max, Min, Product,** Standard deviation**,** etc. by changing the value field settings in this PivotTable example

6.2.2.2 To Create a Pivot Table from Multiple Sheets

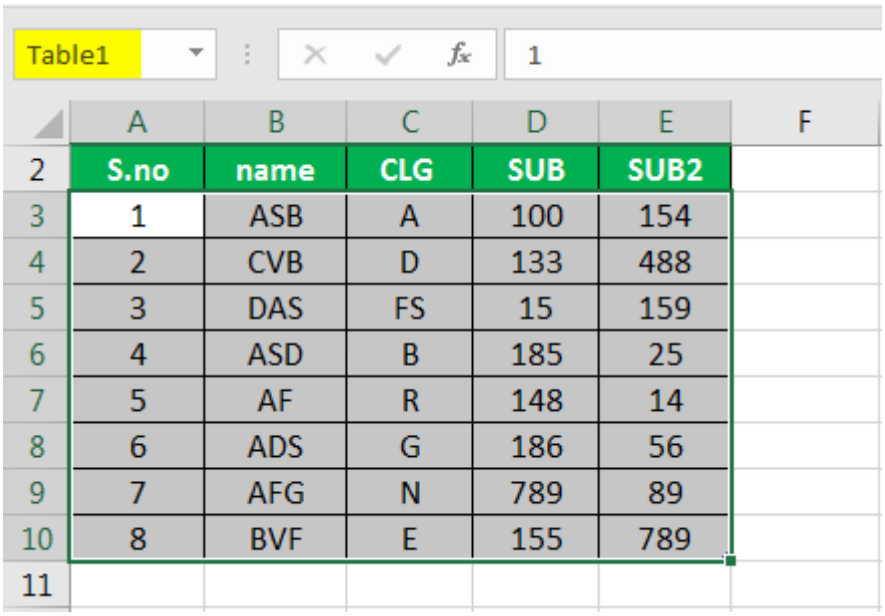
Implementing PivotTables from multiple worksheets has some different processes. This process can also be done in different ways. The following are the other methods to create a PivotTable from multiple sheets in Excel.

Procedure:

In this method, there should be a common row in both tables. It will act as the primary key for the first table and the foreign key for the second table.

Suppose we are using Sheet 4 and Sheet 5 to create a PivotTable from multiple sheets in Excel.

- **Step 1:** In sheets 3 and 4, select the table, click “CTRL + T” to select the whole data, and draw a table for complete data. Now, it will insert a table in the data. The name will be displayed on the table in the left corner. This process can be done for all the tables containing the data.

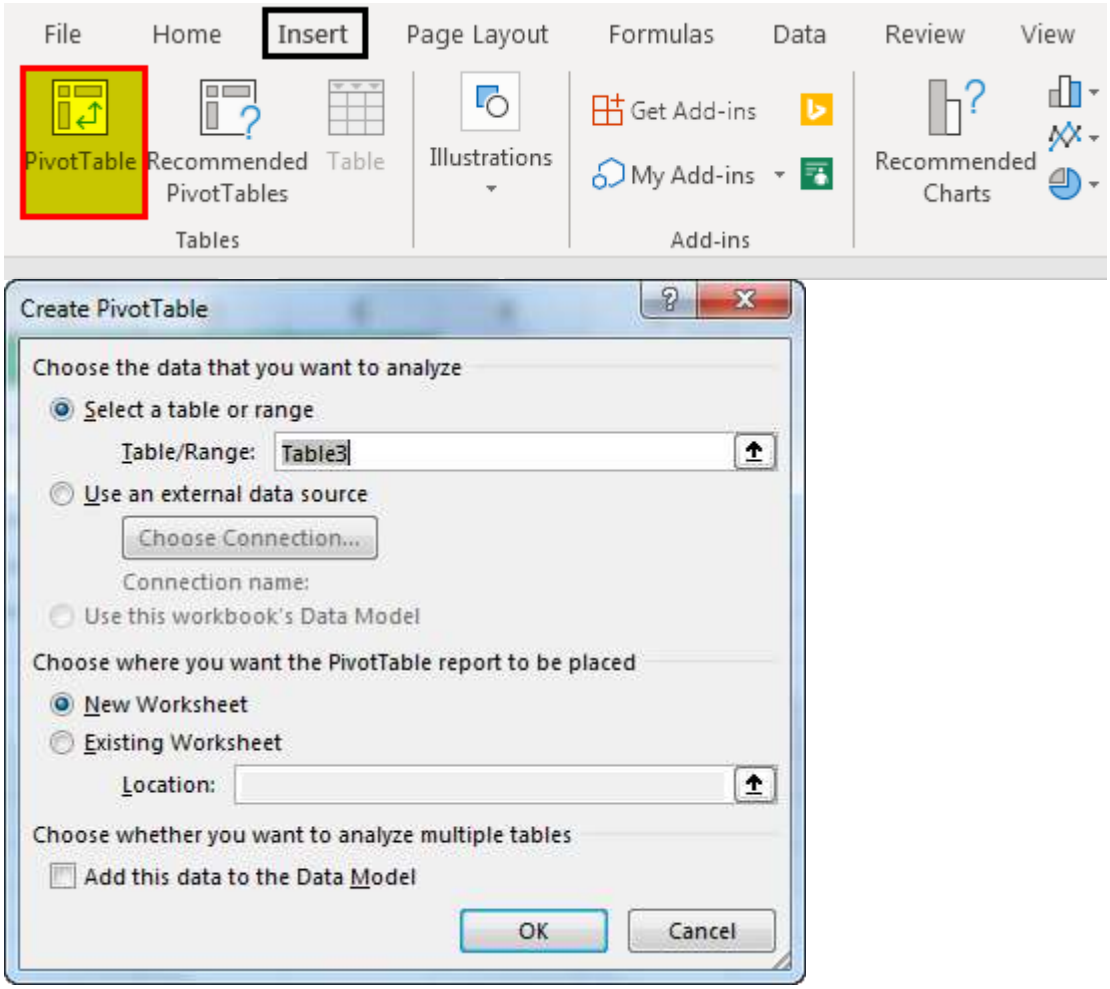


	A	B	C	D	E	F
2	S.no	name	CLG	SUB	SUB2	
3	1	ASB	A	100	154	
4	2	CVB	D	133	488	
5	3	DAS	FS	15	159	
6	4	ASD	B	185	25	
7	5	AF	R	148	14	
8	6	ADS	G	186	56	
9	7	AFG	N	789	89	
10	8	BVF	E	155	789	
11						

It will add filters in default. If we do not need them, we can turn them off by clicking the “CTRL+SHIFT+L” shortcut from a keyboard or going to the “Data“ tab and clicking on the “Filters” option. Then the filters will be disabled.

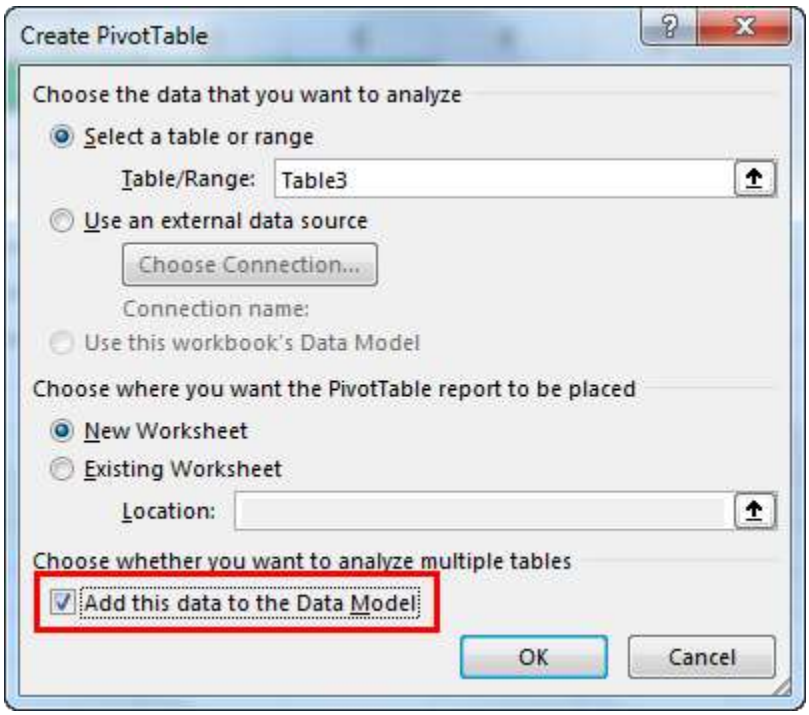
These are the steps to be followed to create a PivotTable for the following data.

- **Step 1:** Click on the “Insert” tab and “PivotTable.” A dialog box will appear now, and you will be asked whether we should create the PivotTable in a new or the same sheet.

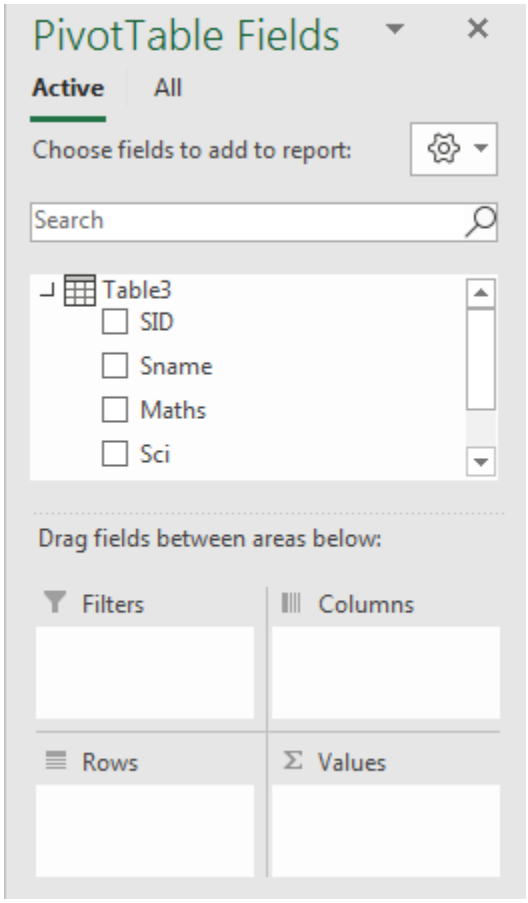


It is good to use a new sheet option in excel.

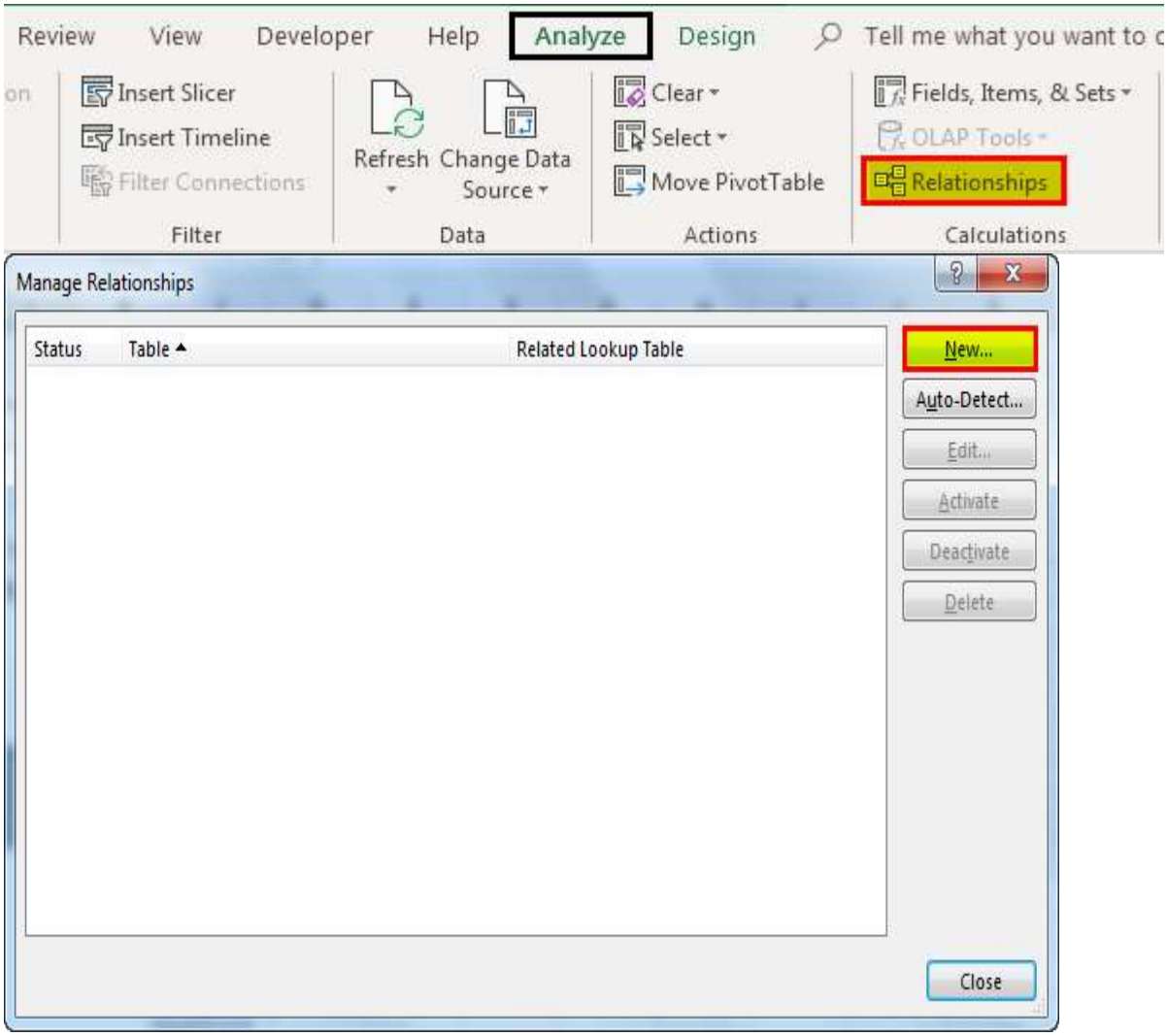
- **Step 2:** Lastly, check the box “Add this data to the Data Model.” It is an important step in this PivotTable creation process.



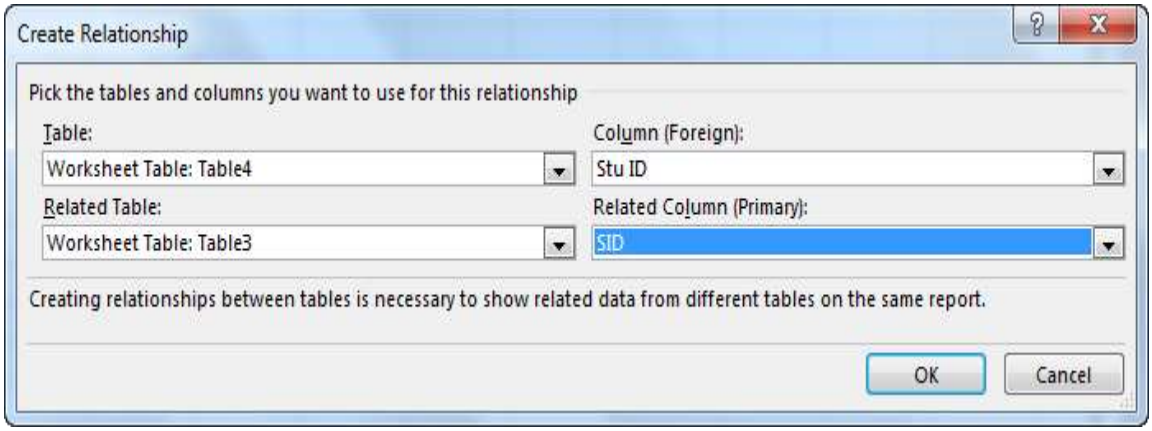
- **Step 3:** A PivotTable will be created now in the new worksheet. On the right side, we may have all the fields related to the PivotTable.



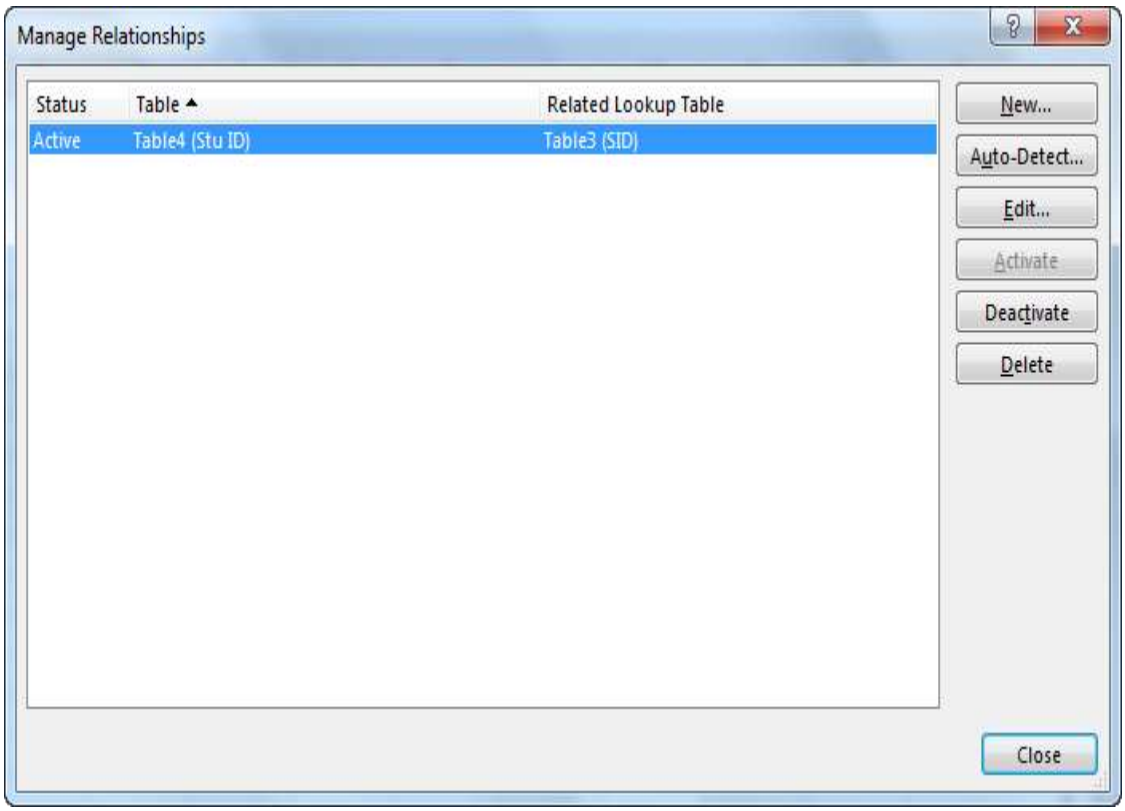
- **Step 4:** Go to the "Analyze" tab -> Relationships -> New.



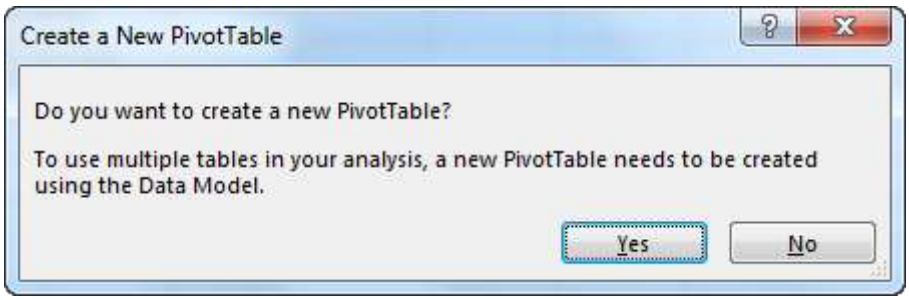
- **Step 5:** The table is the current table. The related table is the table to be added to the PivotTable. The corresponding column is the same in both tables. It is from the first table, also called the primary key. A column is the same in the second column, called a foreign key.



- **Step 6:** Now, click on the ok.



- **Step 7:** Now, we can select the required fields per the requirement. We can choose the fields from all the tables in the PivotTables. For that, it will first ask to create a new PivotTable.



- **Step 8:** Click “Yes.” We can select fields from all the tables to create a PivotTable.

	A	B	C
2			
3	**Row Labels**	**Sum of Total Marks**	
4	0A1	250	
5	0A2	198	
6	0A3	285	
7	0A4	149	
8	0A5	173	
9	**Grand Total**	**1055**	
10			

6.3 PIVOT CHART

A pivot chart in Excel is a visual representation of the data. It gives you the big picture of your raw data. It allows you to analyse data using various types of graphs and layouts. It is considered to be the best chart during a business presentation that involves huge data.

1. Pivot Chart Vs Table

Pivot Table provides us a way to summarize large data in a grid-like matrix. You can choose the fields you wish to use in the table for rows and columns.

Pivot chart provides us with a graphical representation of the pivot table. You can choose from multiple layouts and chart types.This chart also summarizes the data.

You can create both a pivot table and chart for a data source and handle them simultaneously. That means the changes made in the pivot table will reflect in the chart and vice versa.

After you create a PivotTable by selecting its data source, arranging fields in the PivotTable **Field List**, and choosing an initial layout, you can perform the following tasks as you work with a PivotTable:

2 Difference between Pivot Chart and Standard Chart

If you are familiar with standard charts, you will find that most operations are the same in Pivot Charts. However, there are some differences:

Row/Column Orientation Unlike a standard chart, you cannot switch the row/column orientation of a PivotChart by using the **Select Data Source** dialog box. Instead, you can pivot the Row and Column labels of the associated PivotTable to achieve the same effect.

Chart Types You can change a PivotChart to any chart type except an xy (scatter), stock, or bubble chart.

Source data Standard charts are linked directly to worksheet cells, while PivotCharts are based on their associated PivotTable's data source. Unlike a standard chart, you cannot change the chart data range in a PivotChart's **Select Data Source** dialog box.

Formatting Most formatting—including chart elements that you add, layout, and style—is preserved when you refresh a PivotChart. However, trend lines, data labels, error bars, and other changes to data sets are not preserved. Standard charts do not lose this formatting once it is applied.

Although you cannot directly resize the data labels in a PivotChart, you can increase the text font size to effectively resize the labels.

Data source

Given below is the data source sample that will be used to understand the Pivot chart.

Order ID	Order Date	Product Name	Region	City	Quantity	Total Price
1	03-01-2020	Plain Cookies	North	New York	33	444.66
2	04-02-2012	Sugar Cookies	South	Lima	432	346.33
3	05-04-2018	Wafers	East	Boston	33	32.54
4	06-05-2019	Chocolate	West	Oak Land	245	543.43
5	07-07-2020	Ice-Cream	North	Chicago	324	223.56
7	09-09-2020	Plain Cookies	East	Washington	32	34.4
8	10-11-2020	Sugar Cookies	West	Seattle	12	56.54
9	11-12-2017	Wafers	North	Toronto	323	878.54
10	12-14-2020	Chocolate	South	Lima	232	864.74
11	01-15-2020	Ice-Cream	East	Boston	445	457.54
13	03-18-2018	Salt Cookies	North	New York	5454	34546
14	04-18-2017	Cheese Cookies	South	Lima	5653	3456.34

6.3.2 Creation of Pivot Chart

There are 2 ways to make a pivot chart in Excel.

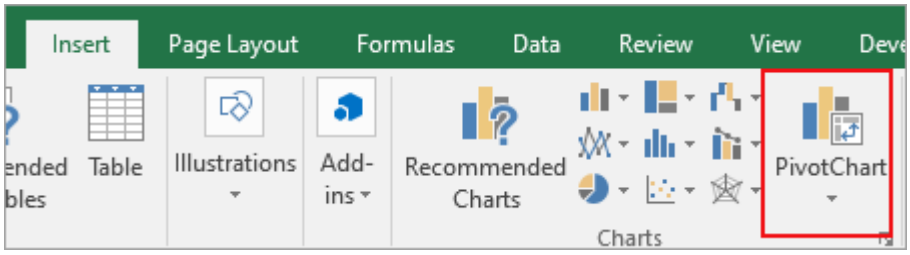
6.3.2.1 Pivot Chart From Data Source

We can create a chart directly from the datasheet without a pivot table.

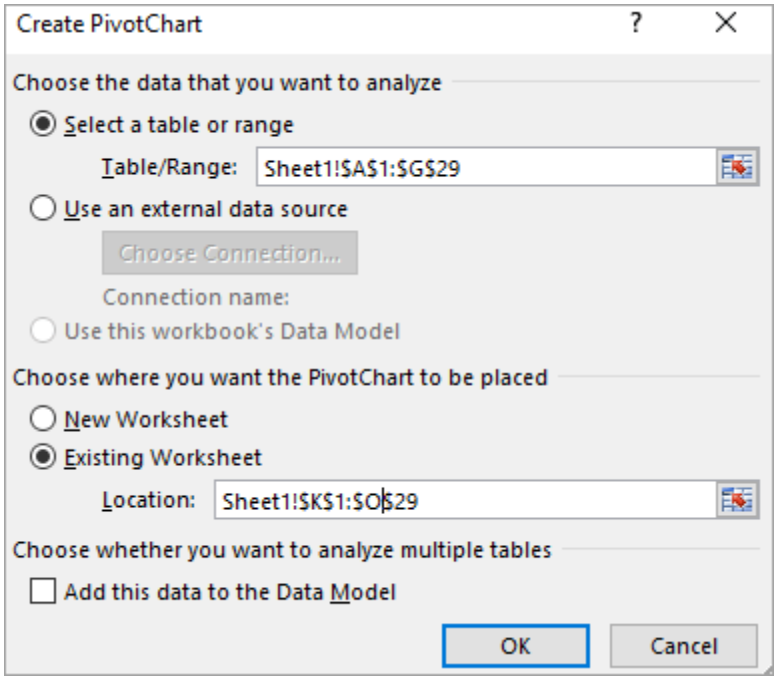
To achieve this follow the below steps.

1) Select any cell in the table.

2) Go to **Insert -> Pivot Chart**

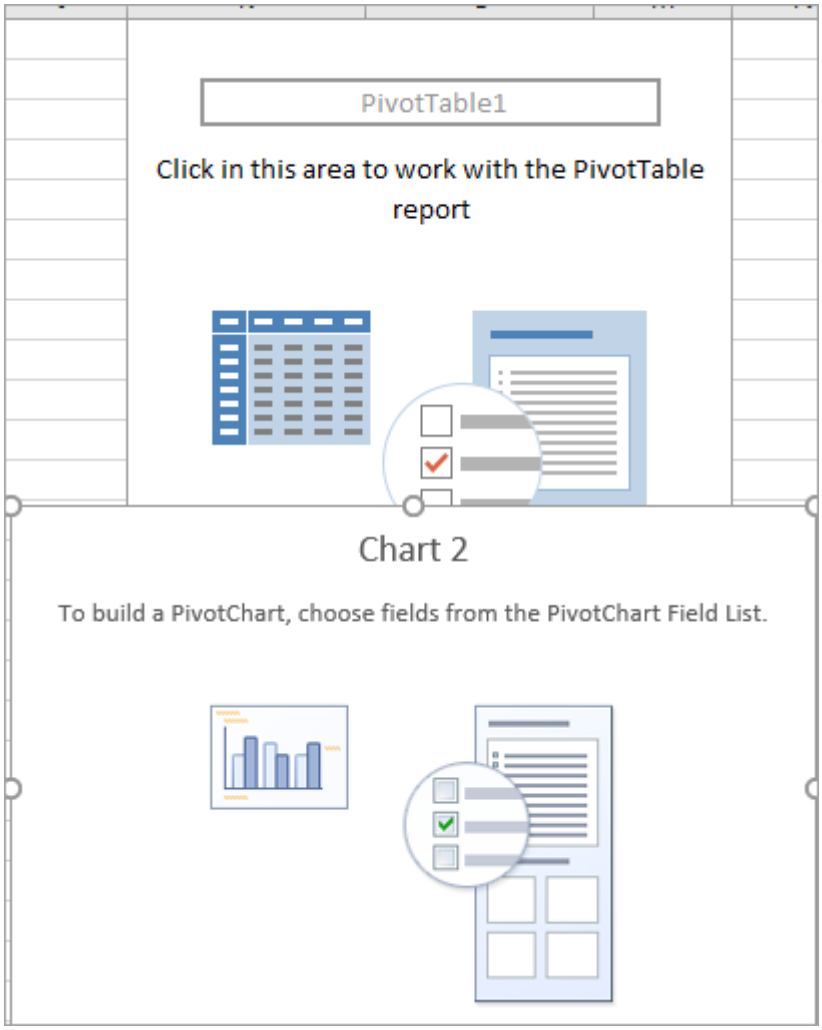


3) You can choose to create a new sheet or mention the table range you want to place the chart under Existing Worksheet.



4) Click OK

This will create a blank pivot chart and its related pivot table. You can add the desired fields to generate a report and chart.



6.3.2.2 Creation of Pivot Chart From Pivot Table

If you have already created a pivot table, you can use the same to generate a pivot chart. We have created a sample PivotTable as shown below.

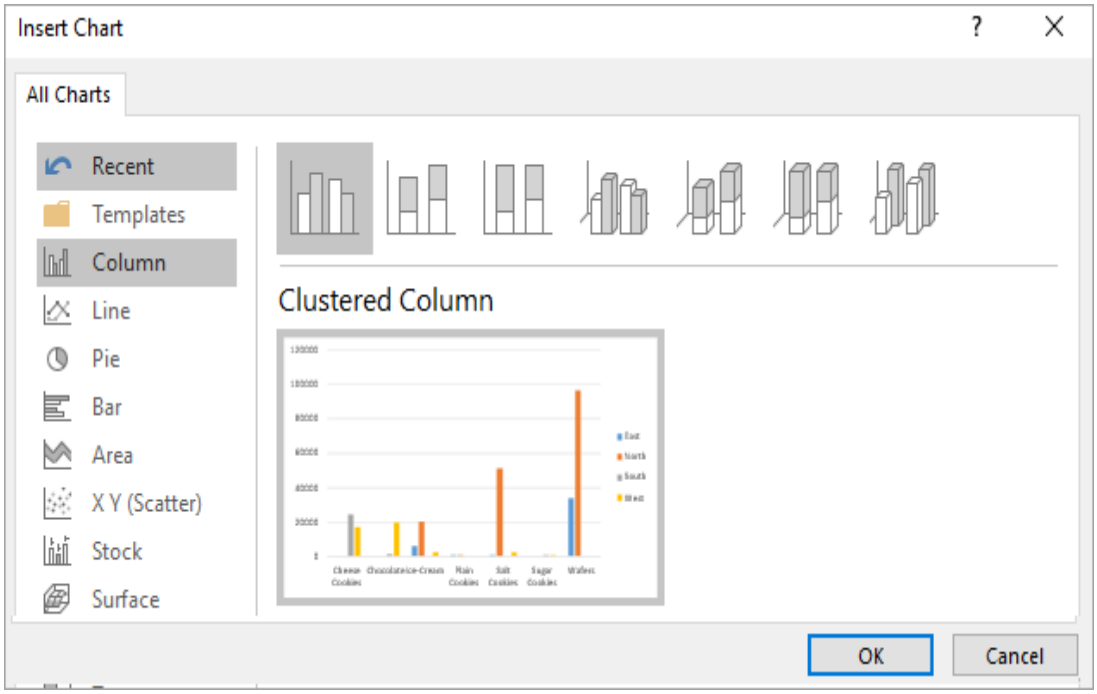
Sum of Total Price	Region				
Product Name	East	North	South	West	Grand Total
Cheese Cookies			24584.29	17072.03	41656.32
Chocolate			1521.24	19734.43	21255.67
Ice-Cream	5911.54	20164.26		2345.66	28421.46
Plain Cookies	34.4	444.66			479.06
Salt Cookies	74.4	51565.78		2346.64	53986.82
Sugar Cookies			346.33	56.54	402.87
Wafers	34160.47	96544.54			130705.01
Grand Total	**40180.81**	**168719.24**	**26451.86**	**41555.3**	**276907.21**

Steps to create a chart.

1) Select any cell in PivotTable.

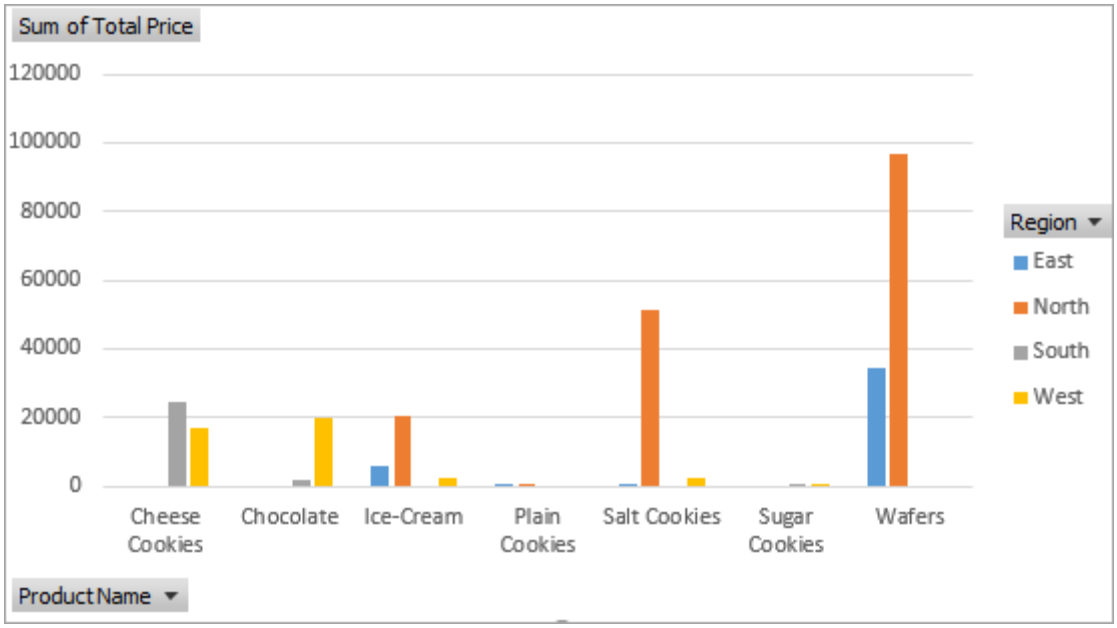
2) Go to **Insert-> Pivot chart**

3) It will give you a list of available charts, select the desired chart.



4) Click ok.

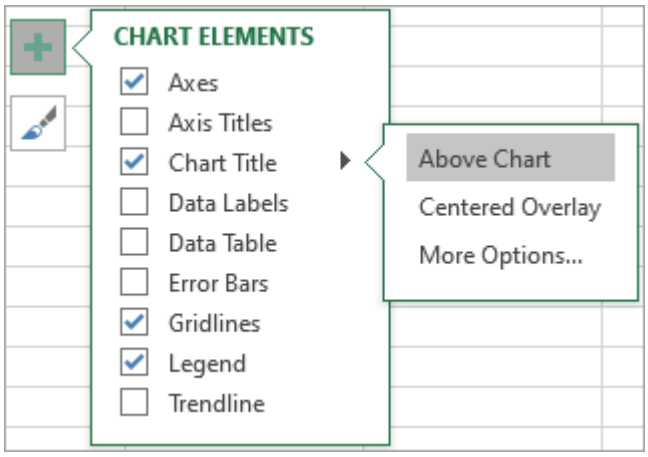
This will generate a chart with data taken from the pivot table. The pivot chart example is shown below.



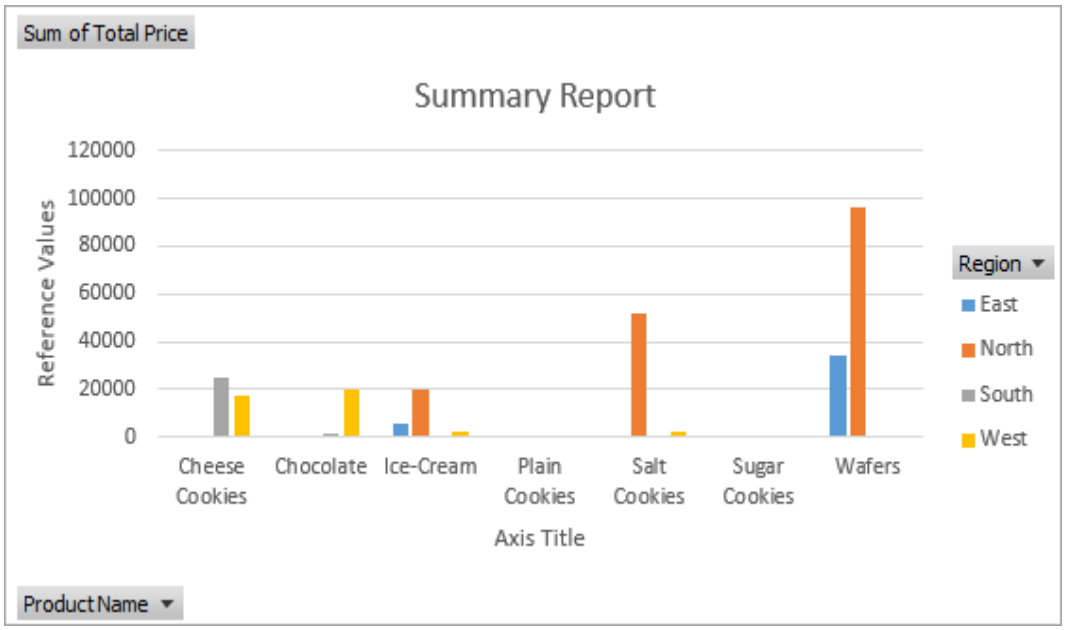
6.4 Customizing the Chart

You can customize the chart using the + and the paint icon present at the right of the chart.

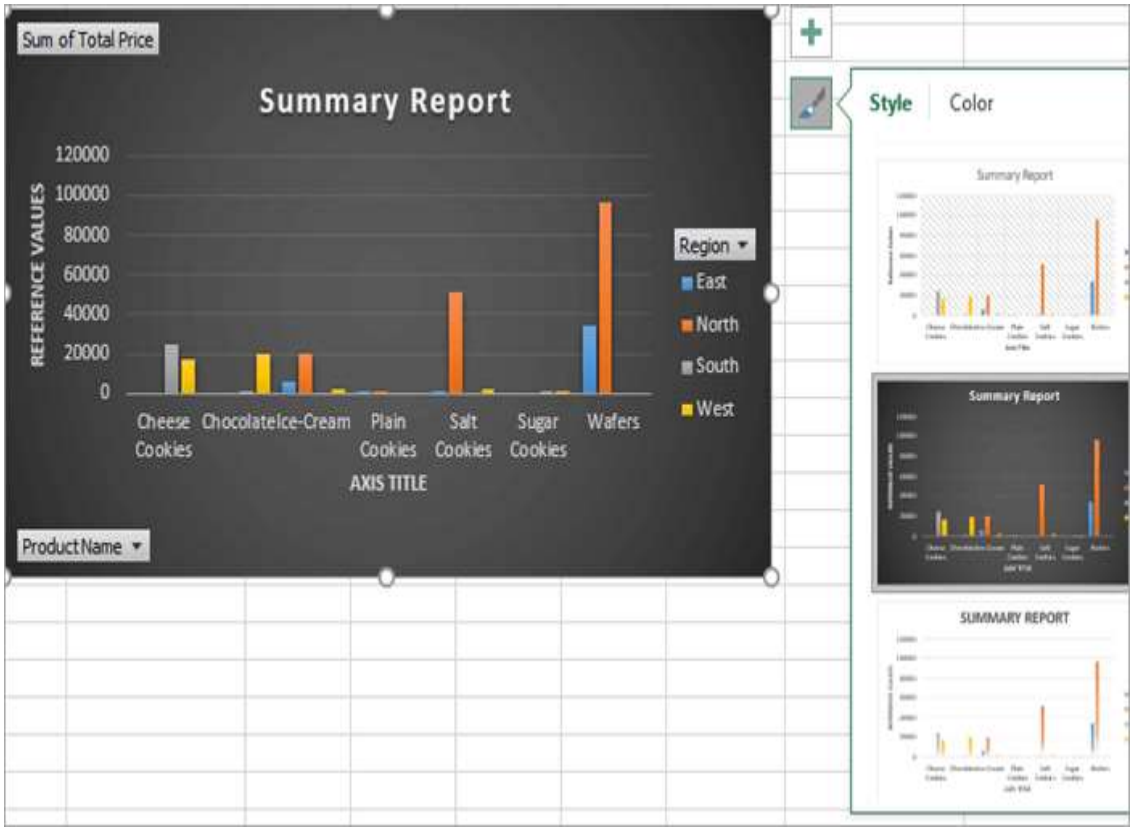
+ Button – It helps you to add or remove chart elements like titles, gridlines, legends, etc and decide their positions.



You can add the title of the chart, mention Axis titles, etc. We have added the chart title and Axis title as an example.



Style of the Chart – You can change the chart style and color by clicking on the paintbrush icon.



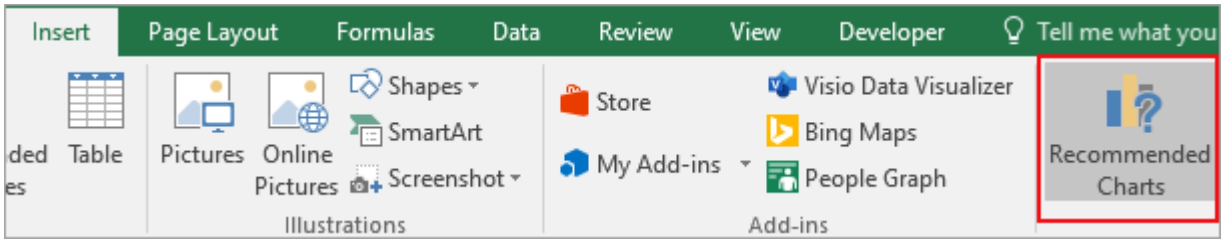
You can also change the color of the chart as you desire from the color section.

6.5 Recommended Charts

Excel gives us Recommended Pivot charts that allow us to quickly choose the type of PivotChart that meets your business requirements.

1) Select the data source table.

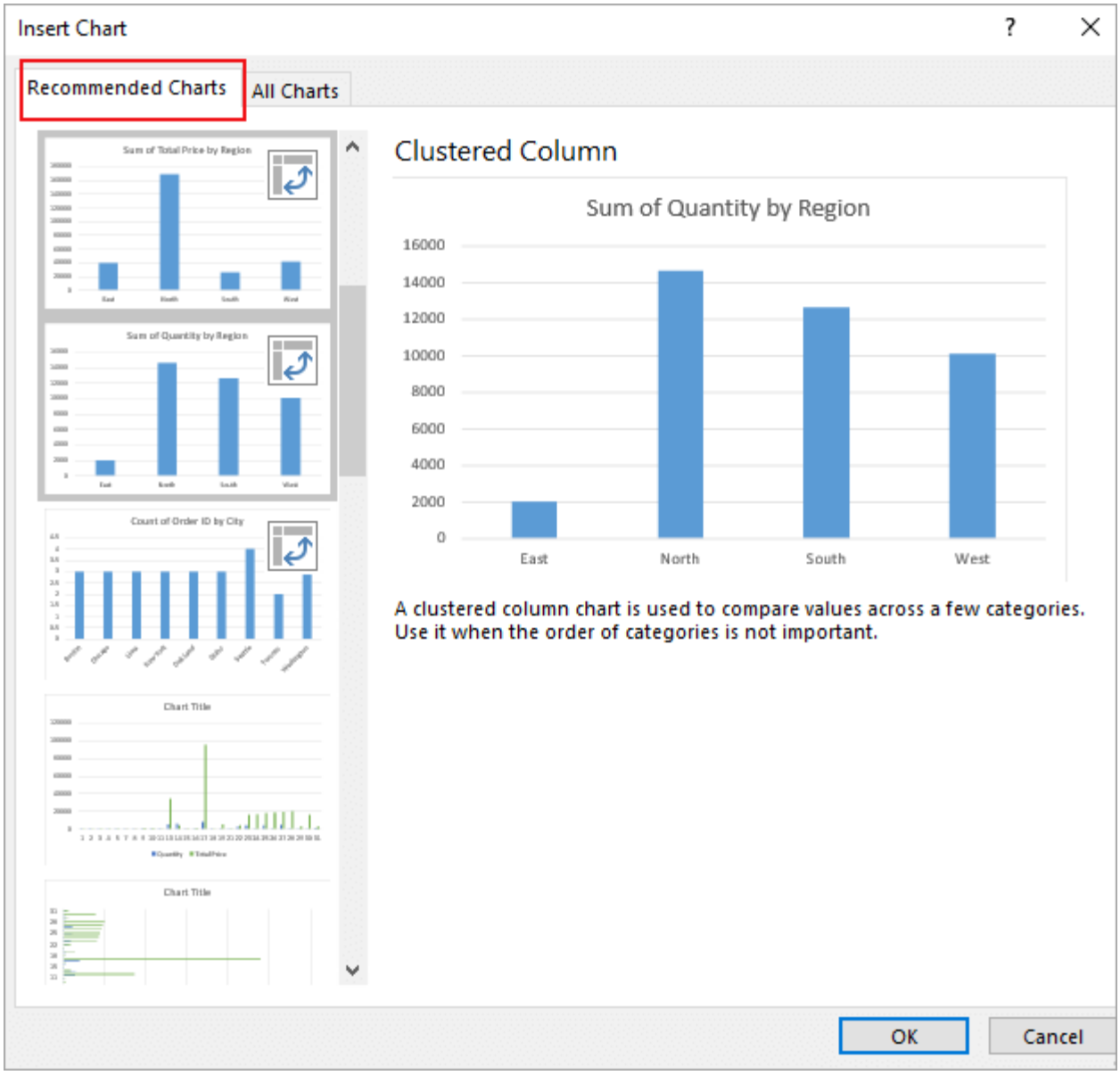
2) Go to **Insert -> Recommended Charts**.



3) Click the Recommended Charts.

4) Click on the chart you need.

5) Click OK



The resulting pivot table and chart will be created in a new sheet and you can further customize them as needed.

Pivot Chart Fields

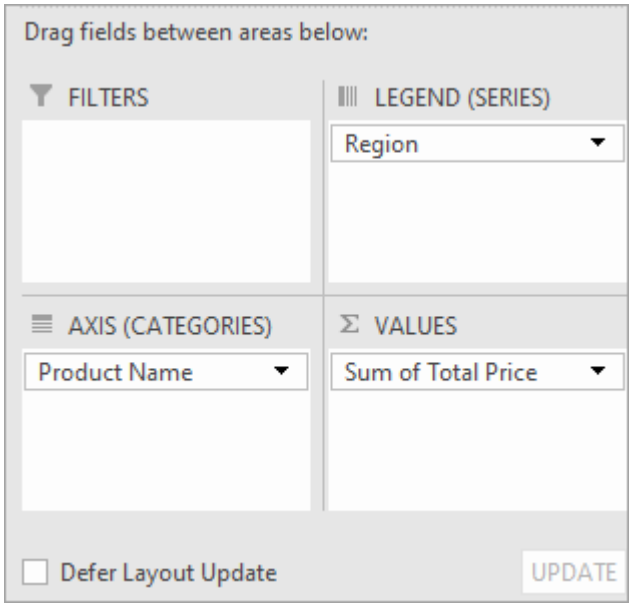
It has 4 fields as shown below.

1. **Filters:** Fields under this gives us the ability to add report filters.

2. **Legends (Series)**: Fields under this represent the Column headers in the pivot table.

3. **Axis (Categories):** This represents the Rows in the Pivot Table. These fields are shown in the Axis Bar on the chart.

4. **Values:** Used to show the summarized numeric values.



6.6 Pivot Charts Tools

Analyze: There are various options available to make the chart more user-friendly.

Chart Name: It is the name of the chart. It is used in writing VBA code and is also in the selection pane. It is available in Excel 2010 and later.

Options: PivotTable Options dialog box will be displayed where you can set Layout & Format, set to show/hide grand total, setting sort options, display options, etc.

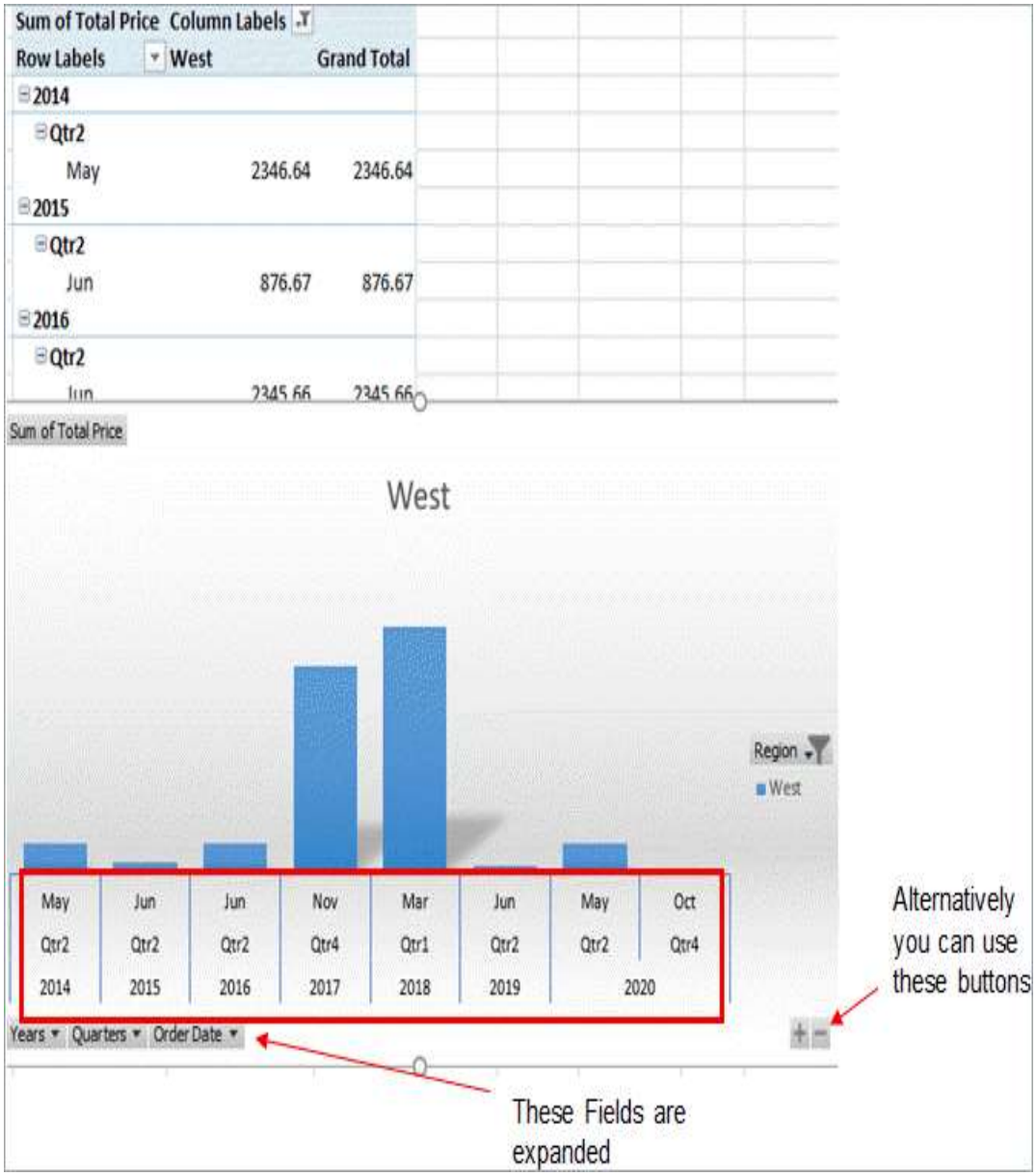
Active Field: You can change the column name on the table. For example, Grand Total to Final amount, etc., and the same will get updated in the Table and Chart.

Expand Field: This is used to automatically expand all the values.

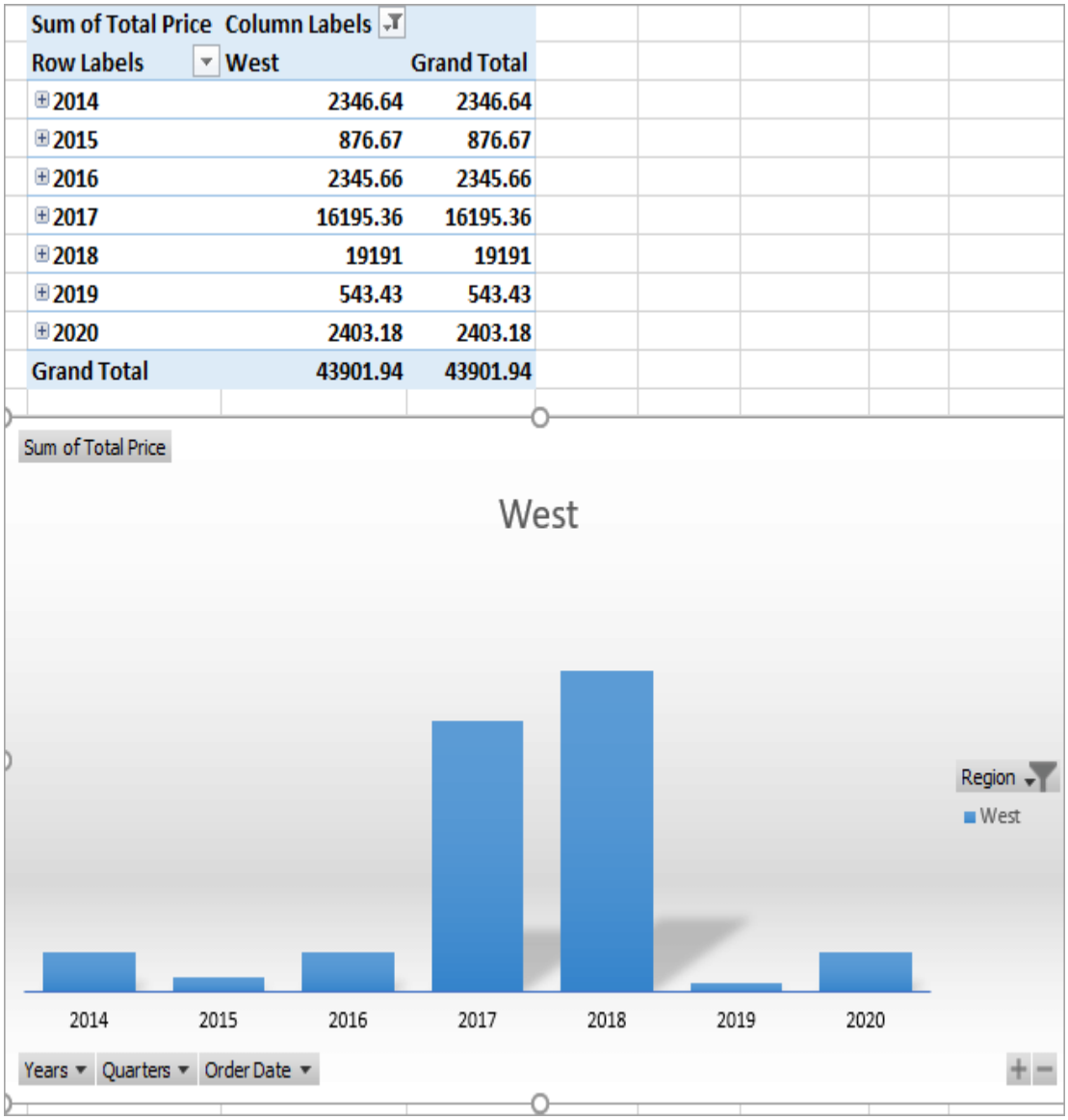
If you have multiple fields like Years, Quarters, and Date then instead of expanding individually, you can click on the Expand Field.

Collapse Field: This is opposite the Expand Field. This will collapse the expanded fields and present a compact chart.

Expand Example



Collapse Example



Note: Suppose you have only one field in Rows, then by clicking on the Expand Field, you give a dialog with all the fields and you can select the desired field. The selected field will be added to the Rows section and the Chart will be updated automatically.

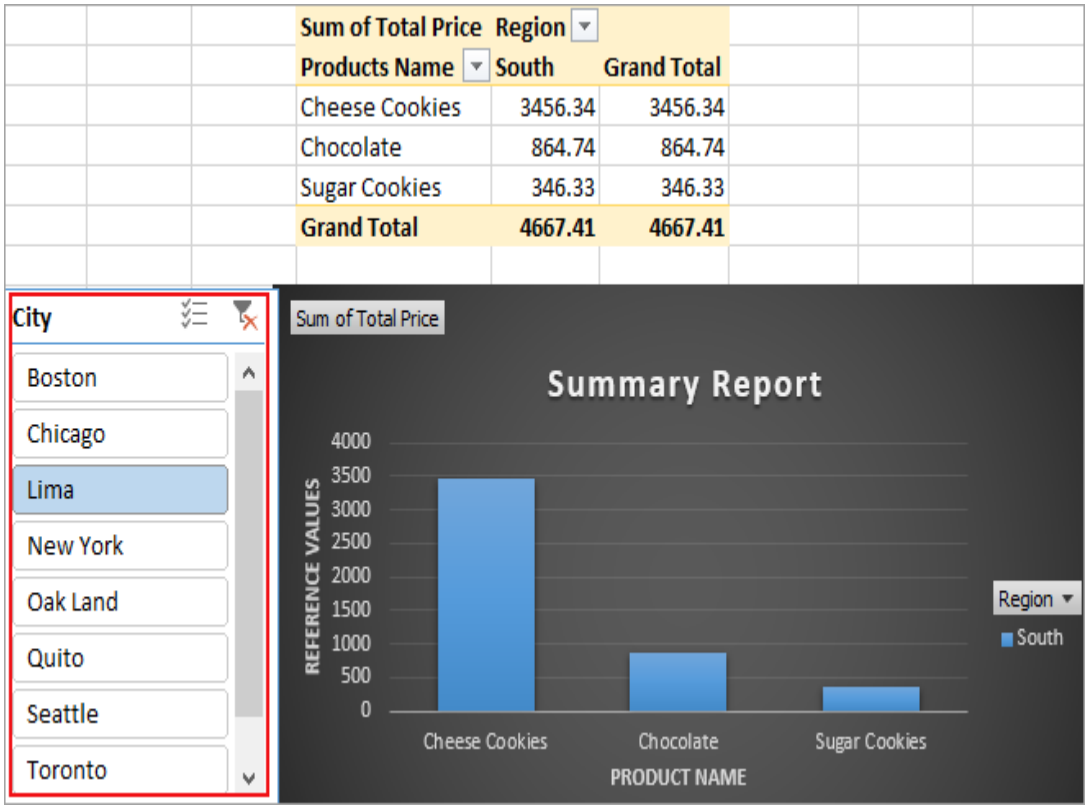
Insert Slicer

You can insert a slicer into the chart just like the pivot table.

To integrate the slicer with a chart follow the below steps.

1. Click on the pivot chart.
2. Go to the **Analyze tab -> Insert Slicer**.
3. In the dialog Select fields, you need to create the slicers.
4. Click OK

This will insert the slicer box as shown below. We have seen how to use slicer in our previous tutorial.



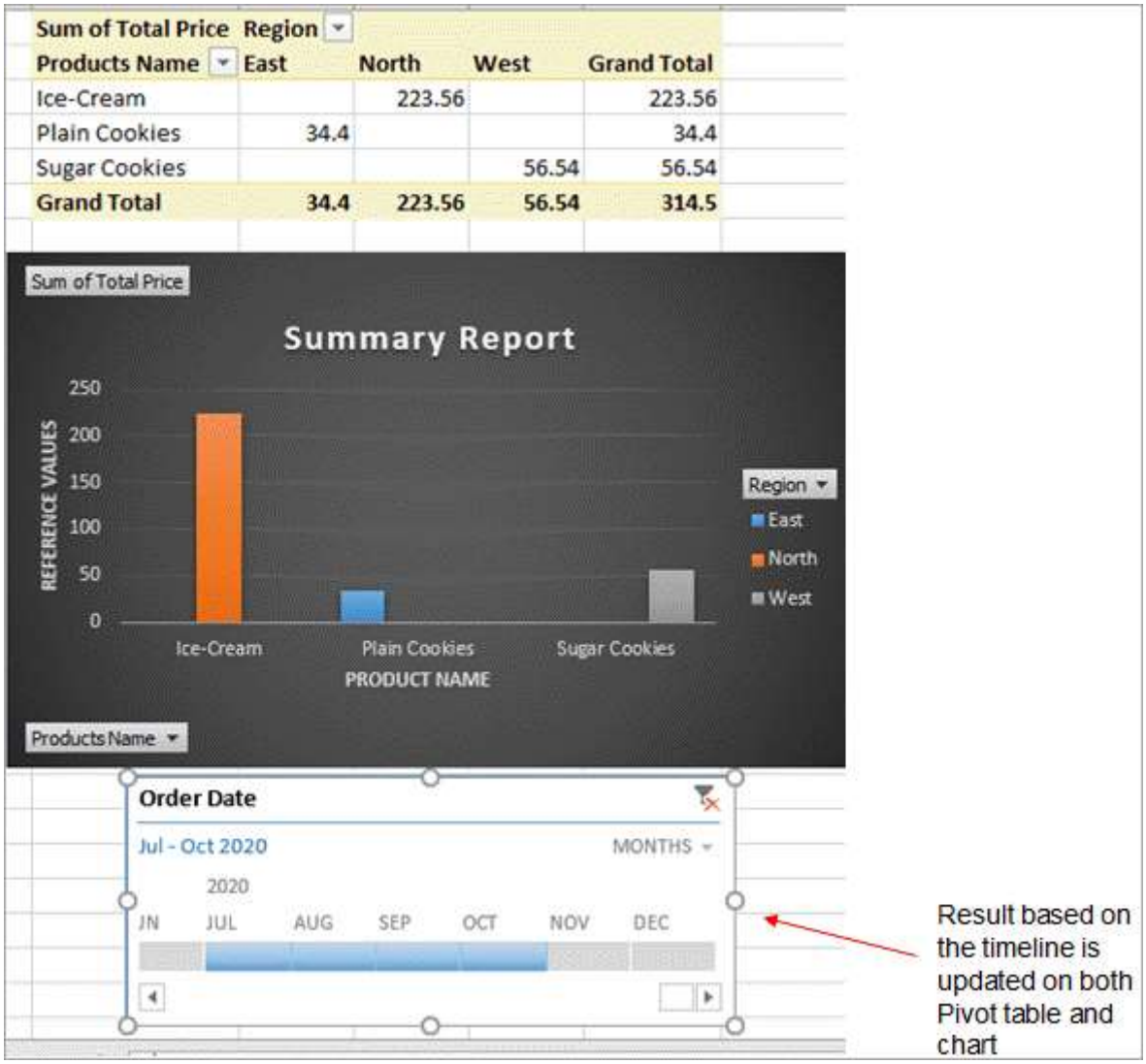
Insert Timeline

You can insert a Timeline into the chart just like a pivot table.

To integrate Timeline with the chart follow the below steps.

1. Click on the pivot chart.
2. Go to the **Analyze tab -> Insert Timeline.**
3. Select the required Date field.
4. Click OK

This will insert the timeline as shown below. We saw how to use the timeline in our previous tutorial.

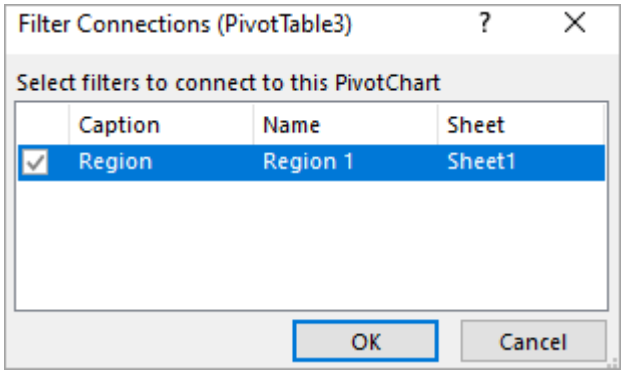


The result based on the timeline is updated on both the Pivot table as well as the chart.

Filter Connection

You can **link the slicer or timeline** to multiple pivot charts. **For example,** we have created 2 Pivot tables and 1 Slicer. You apply the slicer to both charts.

1. Click on the pivot chart to which the slicer is not currently connected.
2. Go to **Analyze -> Filter Connection**
3. Select the Slicer you want to connect.
4. Click Ok



Now you can handle both charts with a single slicer.

Calculations

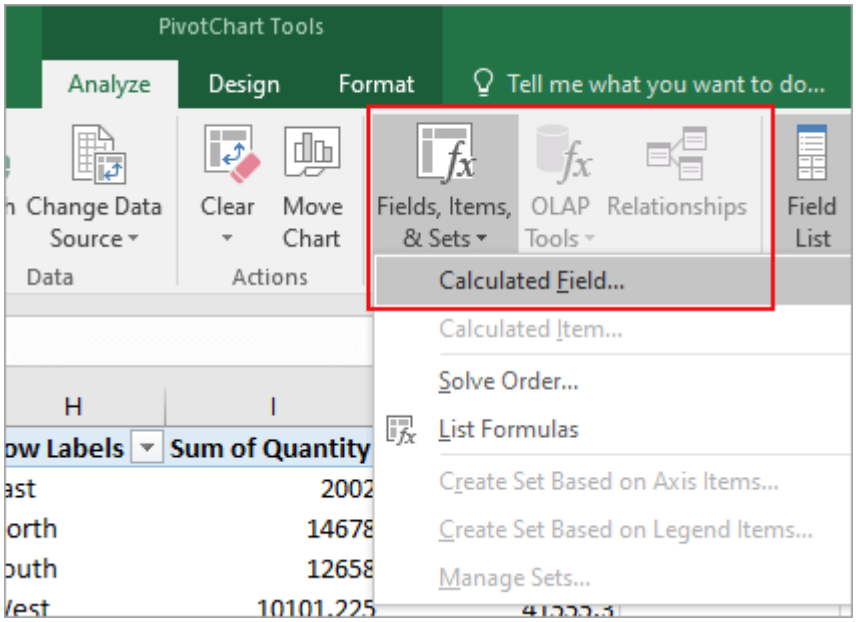
If you want to add any custom formulas, you can do so using the calculation field.

Example:

1) Select the Pivot chart you want to add the custom formulas to.

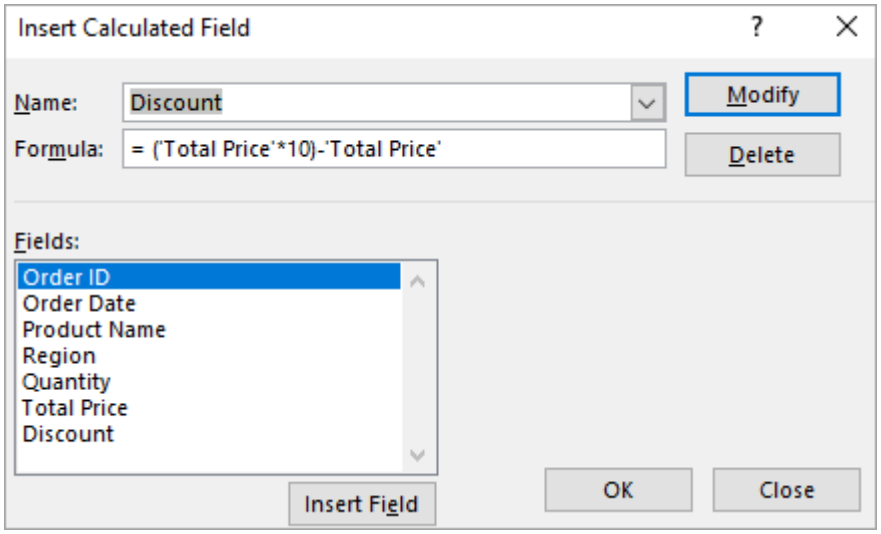
2) Go to **Analyze -> Fields ->Items -> Sets**

3) Select Calculated Fields.

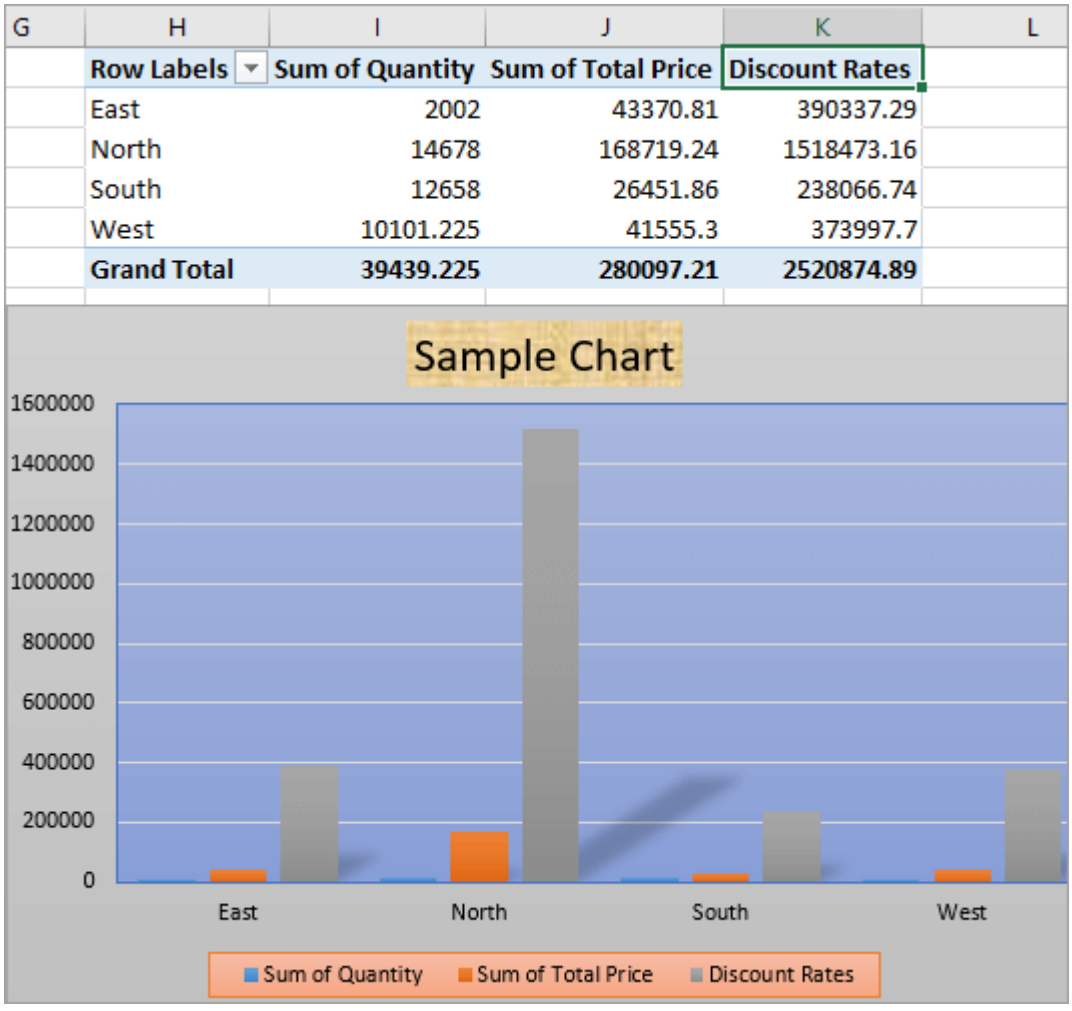


4) In the Name, enter the name you wish.

5) In Formula, Add your custom formula. If you are giving a 10% discount on the total sum, then you can add a formula as shown below.



6) The pivot table, pivot fields, and chart will be updated accordingly.



Row Labels	Sum of Quantity	Sum of Total Price	Discount Rates
East	2002	43370.81	390337.29
North	14678	168719.24	1518473.16
South	12658	26451.86	238066.74
West	10101.225	41555.3	373997.7
Grand Total	**39439.225**	**280097.21**	**2520874.89**

Refresh

Whenever you change the values in the data source, click anywhere on the pivot chart and Right-click and select Refresh or go to Analyze -> Refresh. Refreshing a pivot table also will refresh the chart.

Change Data Source

Whenever you add more rows to the data source, the chart won't take the added rows, as we have defined the range while creating the chart.

To include the new rows:

1. Click anywhere on the Pivot Chart.
2. Go to **Analyze -> Change Data Source**
3. Change PivotTable Data Source dialog will appear and you can enter the new data range.
4. Click Ok

Make sure that you do the above steps for all the charts individually.

Clear

Using Clear, you can clear the entire Pivot Chart. It will be an empty Chart and a Table.

1. Click on the Pivot Chart
2. **Analyze -> Clear -> Clear All**

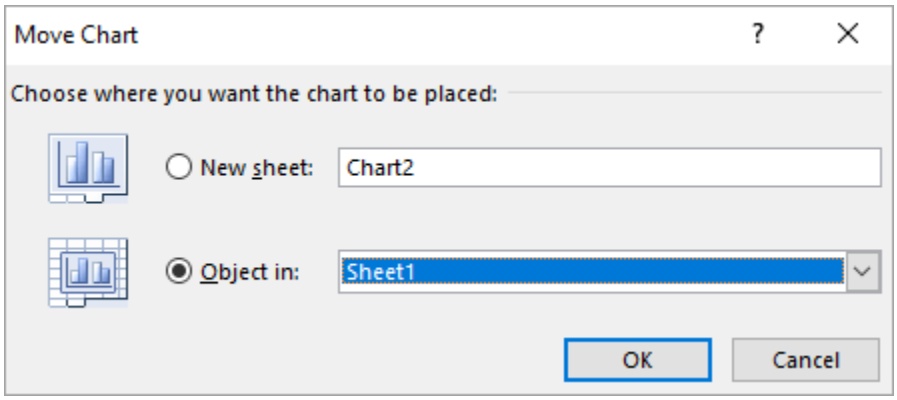
You can also clear all the applied filters by **Analyze -> Clear-> Clear Filters**

Move Chart

After creating a chart, you can move it to the desired location.

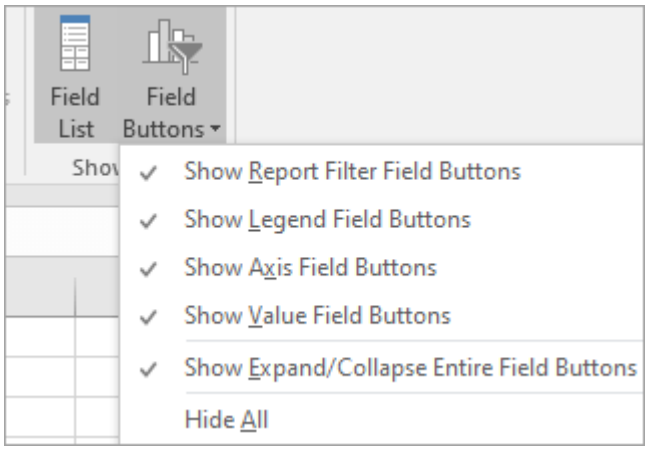
Follow the below steps:

1. Click on the pivot chart.
2. Go to **Analyze -> Move Chart**
3. Select the desired option from the dialog:
    - **New Sheet:** The sheet will be automatically created and the chart will be displayed.
    - **Object in:** You can select among the available sheets and the chart will be moved to the selected sheet.



Field List: You can show/hide the PivotChart Fields pane.

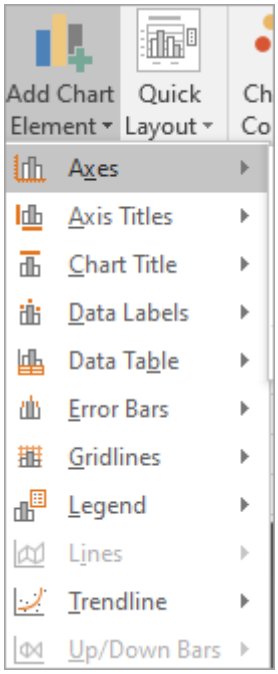
Field Buttons: You can show/hide the Legend Field, Axis Field, Value Field, Report filter, etc. on the chart.



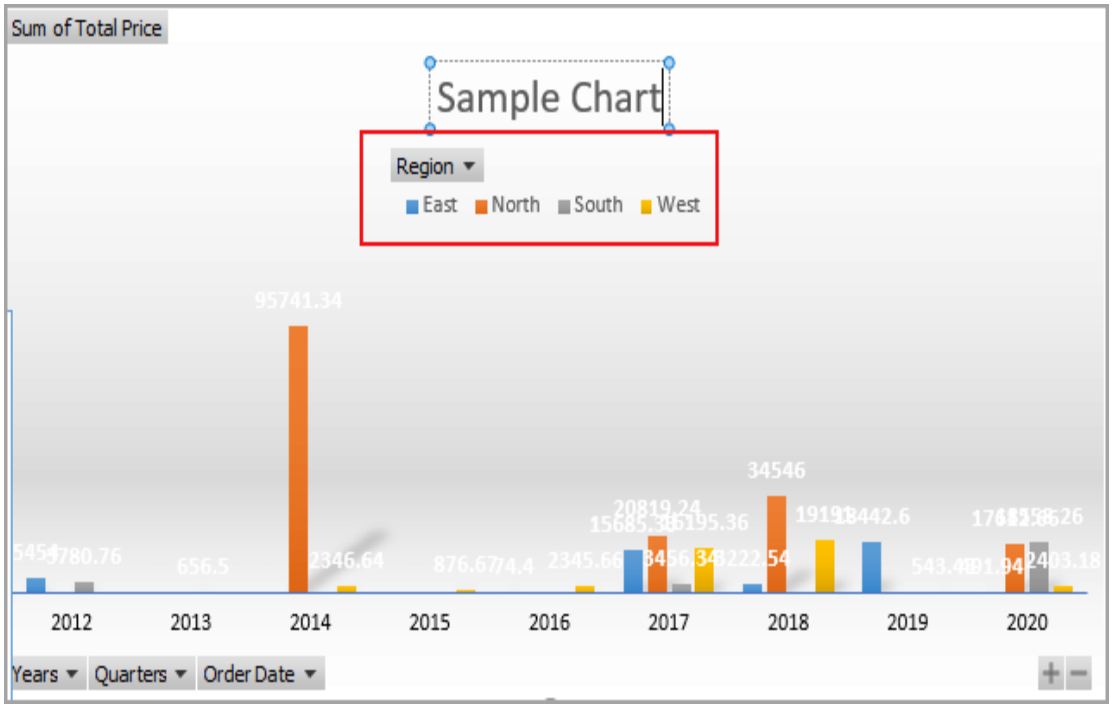
Design

There are several options available to design the chart under this tab.

Add Chart Element: This gives us the same options as we got when we clicked on the + button next to the pivot chart. They help us to add elements to the chart like title, error bard, etc.



Quick Layout: You can change the default layout and select among the predefined layout available. **For example,** we have moved the Region layout to the Top instead of the right side.



Change Colors: Select the different colors for your chart.

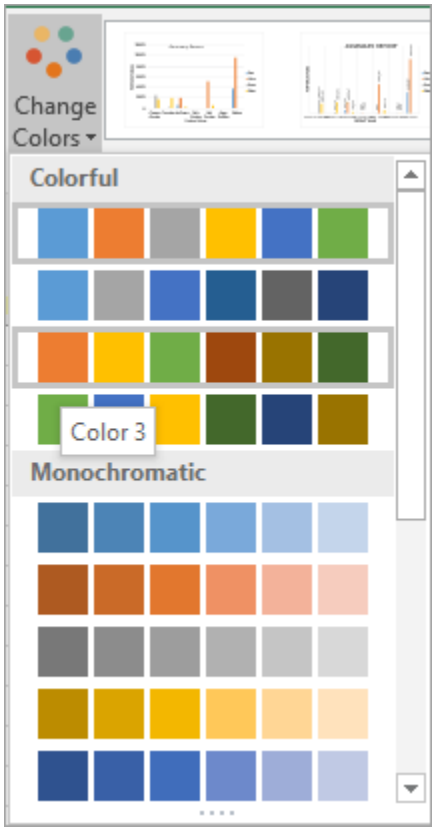
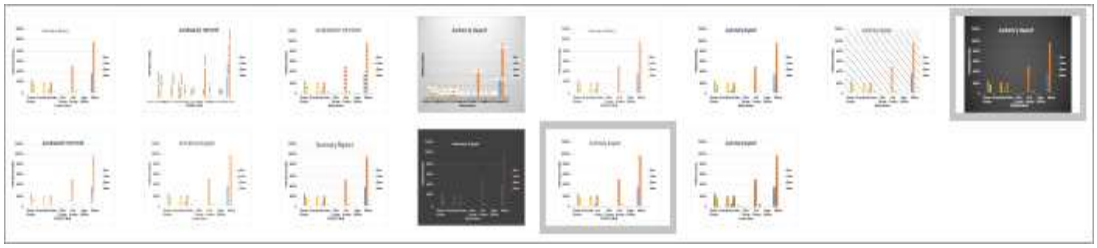


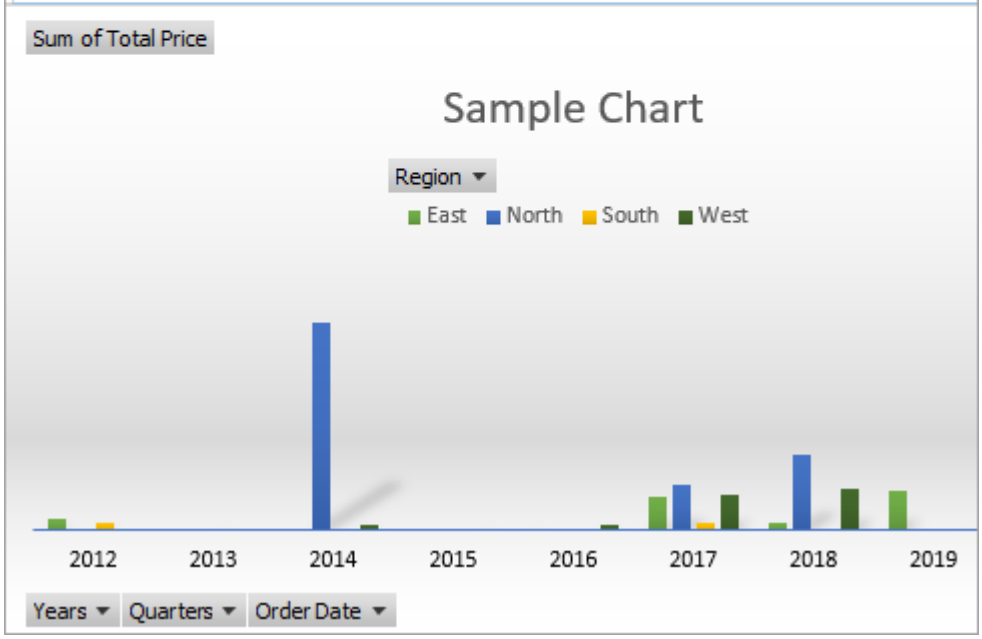
Chart Style: Choose the Style for your chart from these available charts.



Switch Row/Column: You can easily switch Rows and Columns with just one click and the pivot table and chart will be updated automatically.

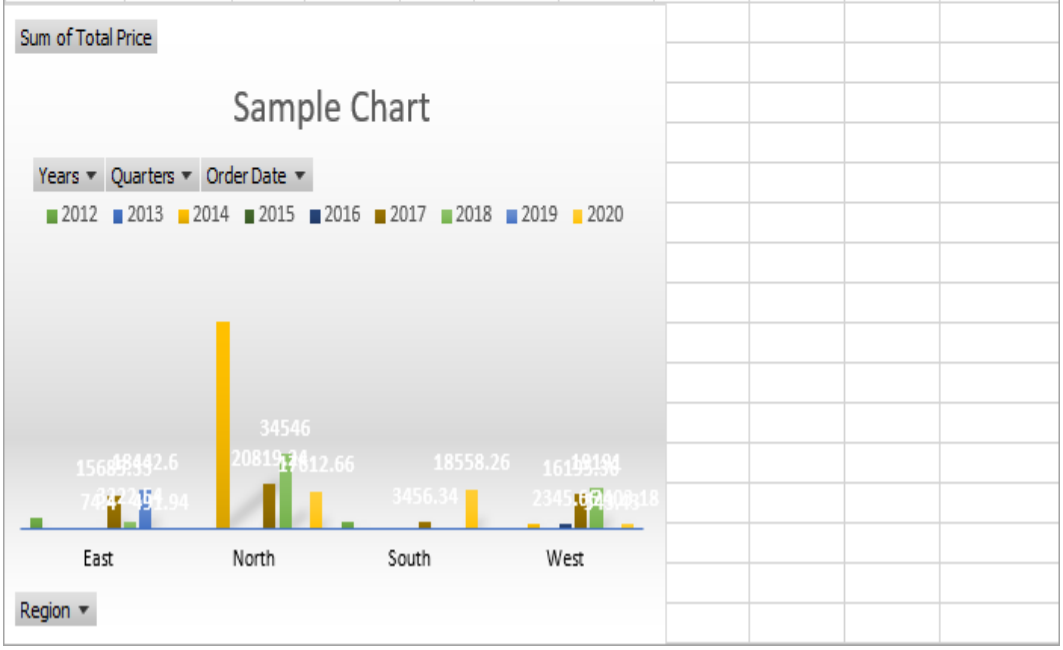
Before Switching Row/Column

Sum of Total Price	Column Labels				
Row Labels	East	North	South	West	Grand T
2012	5454		3780.76		923
2013			656.5		6
2014		95741.34		2346.64	9808
2015				876.67	87
2016	74.4			2345.66	242
2017	15685.33	20819.24	3456.34	16195.36	5615
2018	3222.54	34546		19191	5695
2019	18442.6			543.43	1898
2020	491.94	17612.66	18558.26	2403.18	3906



After Switching Row/Column

Sum of Total Column	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
Row Labe										
East	5454				74.4	15685.33	3222.54	18442.6	491.94	43370.81
North			95741.34			20819.24	34546		17612.66	168719.24
South	3780.76	656.5				3456.34			18558.26	26451.86
West			2346.64	876.67	2345.66	16195.36	19191	543.43	2403.18	43901.94
Grand Total	**9234.76**	**656.5**	**98087.98**	**876.67**	**2420.06**	**56156.27**	**56959.54**	**18986.03**	**39066.04**	**282443.85**



Select Data: Suppose you have spent a lot of time formatting a pivot chart according to your company standards and all your charts should be in the same format. Then this option comes in handy. You can't directly copy the pivot chart and change the data source. There are a couple of steps to be conducted.

1) Select the desired pivot chart and copy the chart area.

2) Open a new workbook. **File -> New Workbook**

3) Paste the copied chart. You can notice in the Menu bar that it says Chart Tools and not PivotChart Tools.

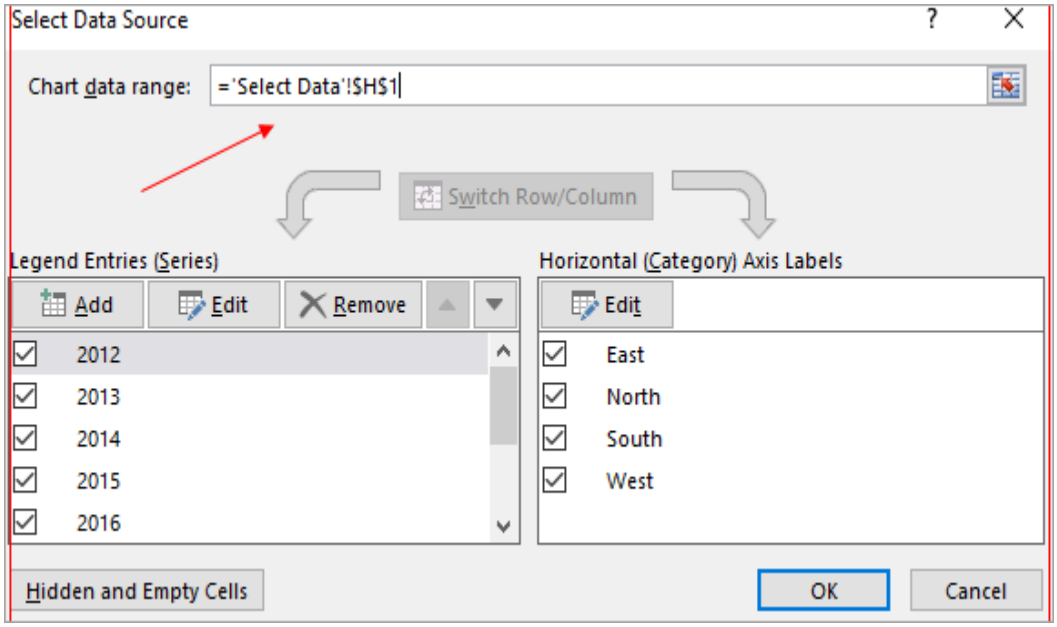
4) Now select the Chart area and hit the Cut option.

5) Go to the workbook where you want to use this chart.

6) Note: You should already have a pivot table created.

7) Paste the chart from step 4.

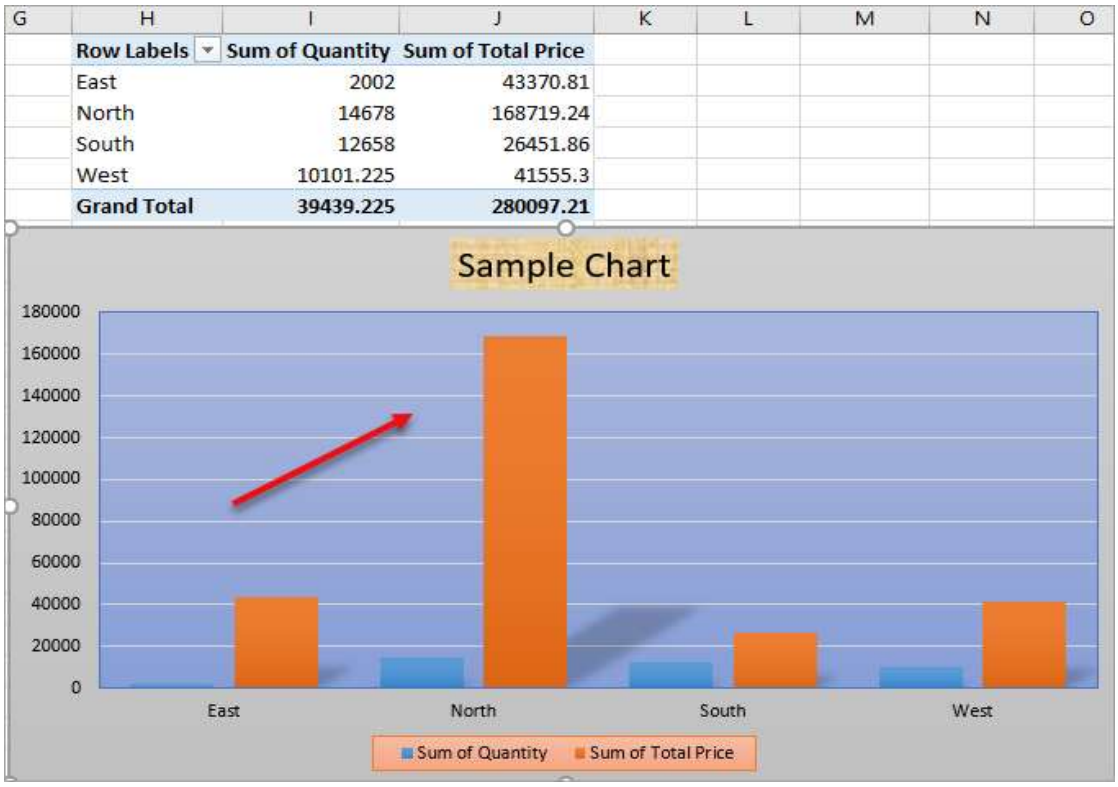
8) Go to Design present under Chart Tools. Click on Select Data Tab.



9) Click on any cell in the pivot table.

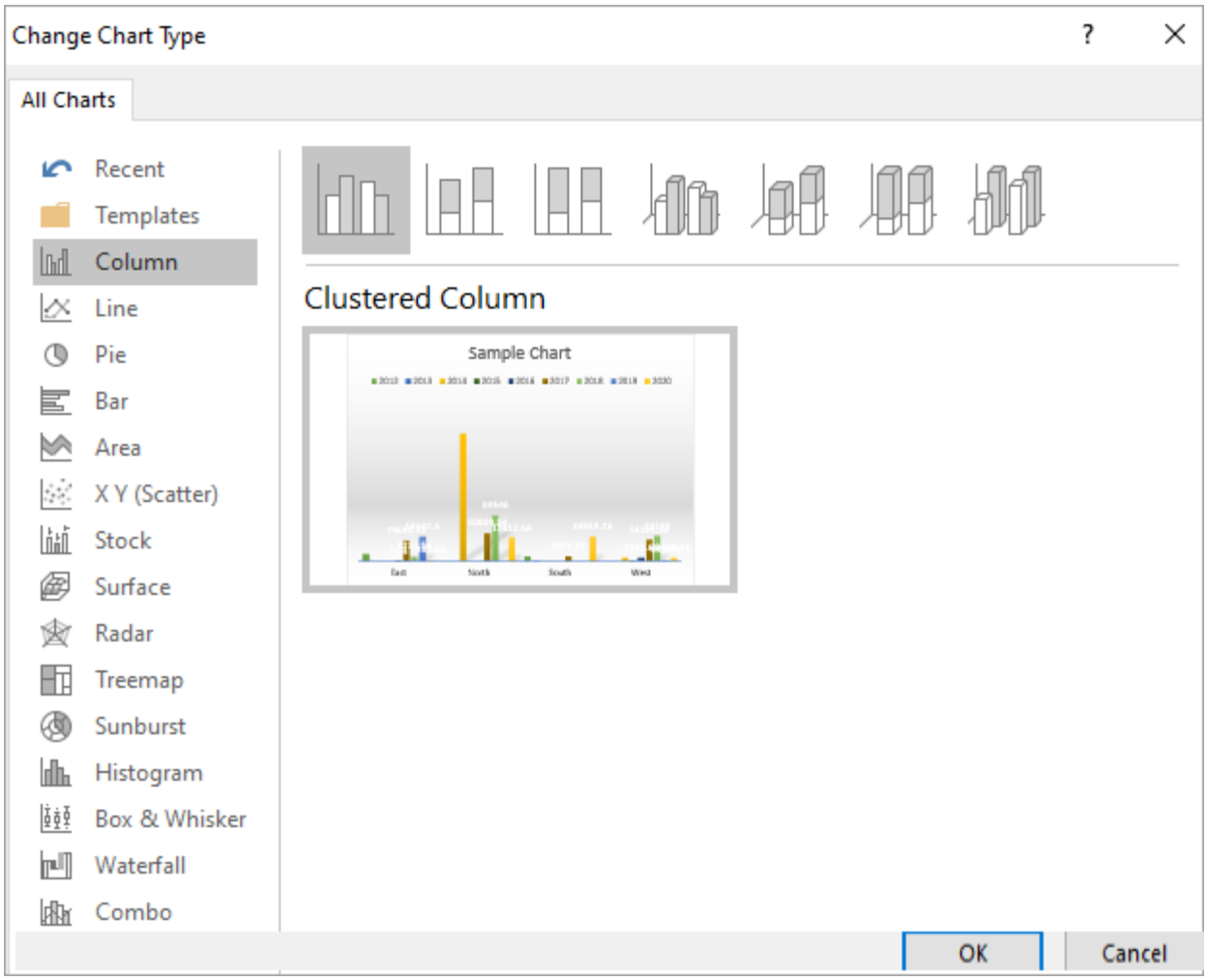
Pivot Chart will be created with the data present in the new pivot table, but the format remains the same as previously. You can modify the Axis and Legend as needed for the new table.

The resulting chart for the new pivot table is shown below.



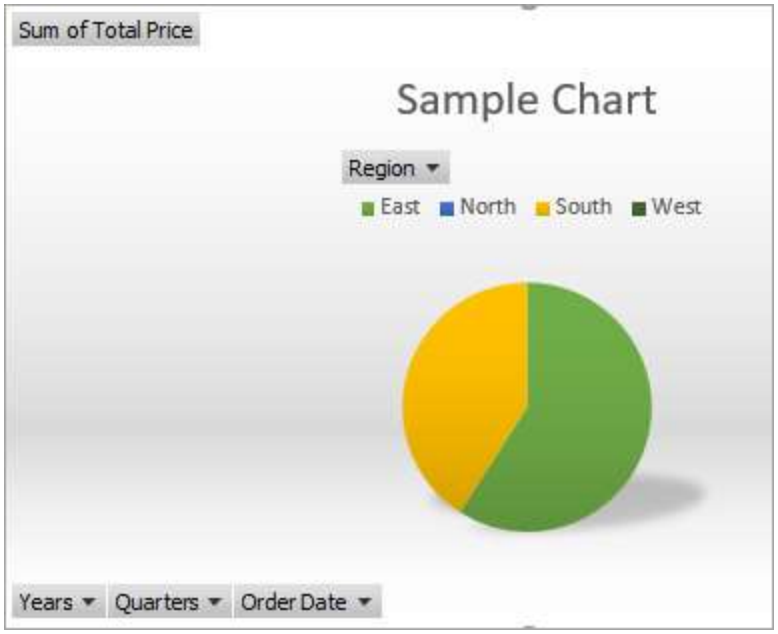
Row Labels	Sum of Quantity	Sum of Total Price
East	2002	43370.81
North	14678	168719.24
South	12658	26451.86
West	10101.225	41555.3
Grand Total	**39439.225**	**280097.21**

Change Chart Type: You can change the default column chart type to the desired type as shown below.

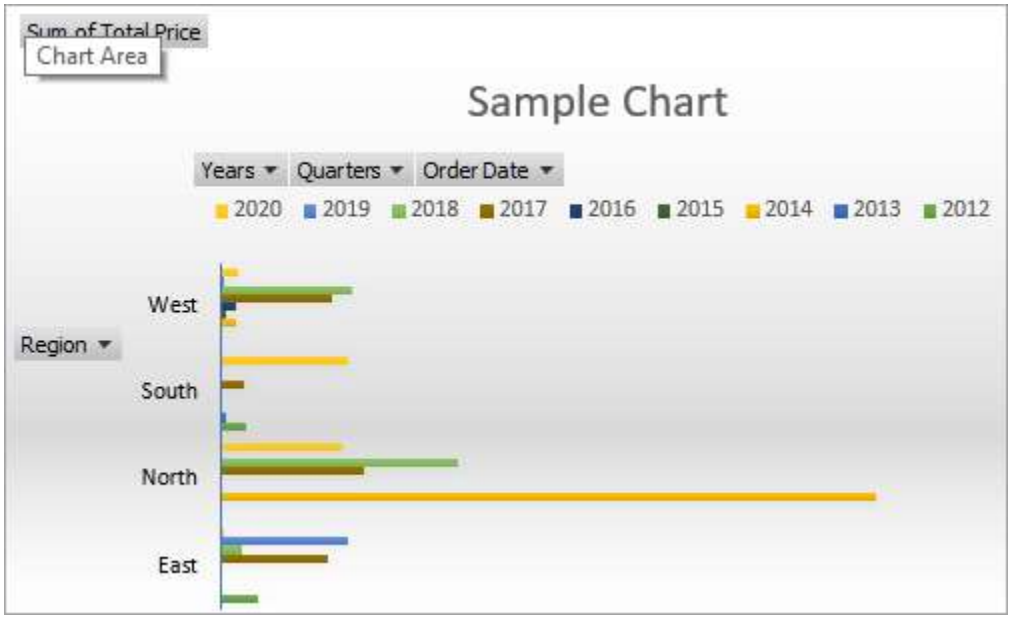


The chart will update automatically based on the selection.

Pie Chart



Bar Chart



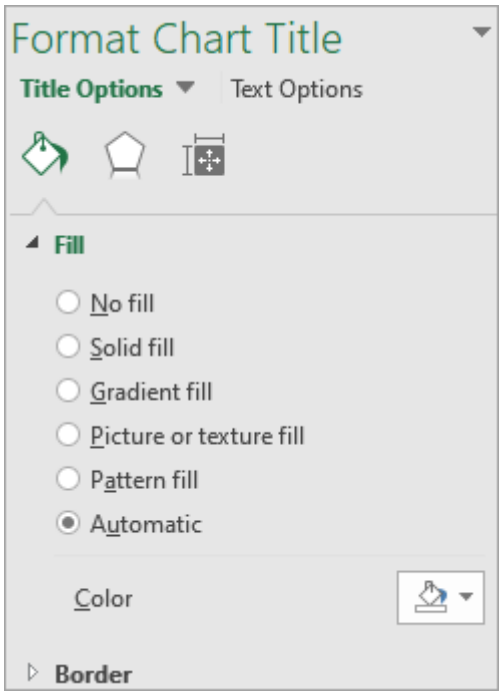
Format

These are basically used to custom format the text present inside the chart.

Current Selection: This will show all the elements present in the table and you can select the one in which you want to change the format style. **For example,** We will select Chart Title and change its style.

1) Select Chart Title from the drop-down.

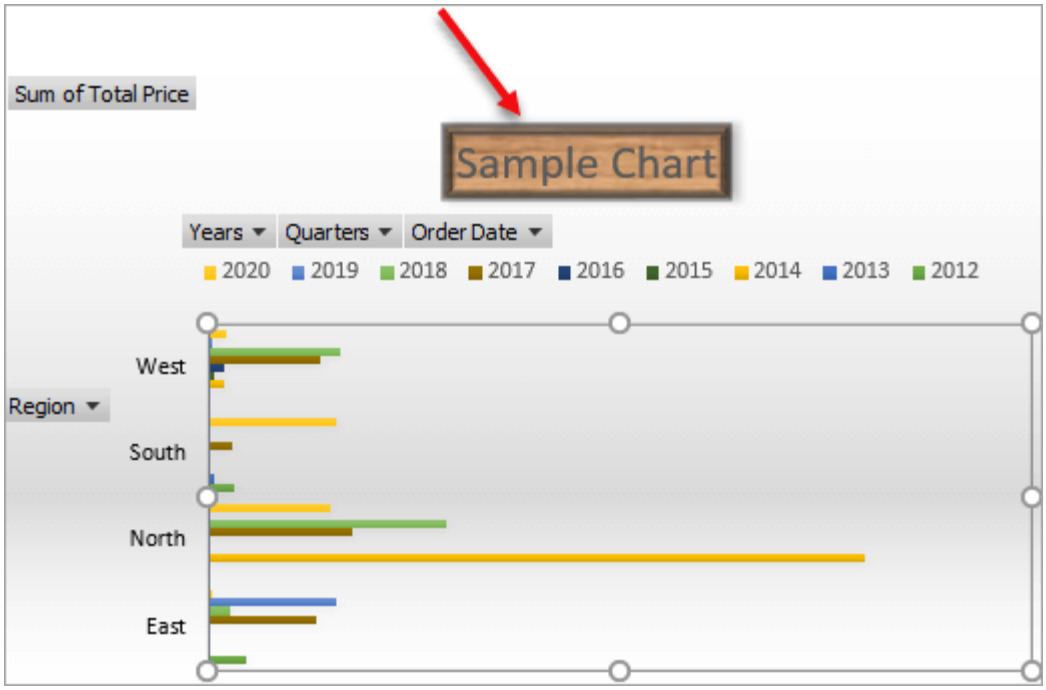
2) Click on Format Selection.



3) Format Chart Title will Open on the right pane.

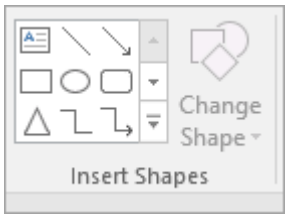
4) Choose the color, style, border, etc as you desire.

After a few basic formatting, a Chart Title will look as below.



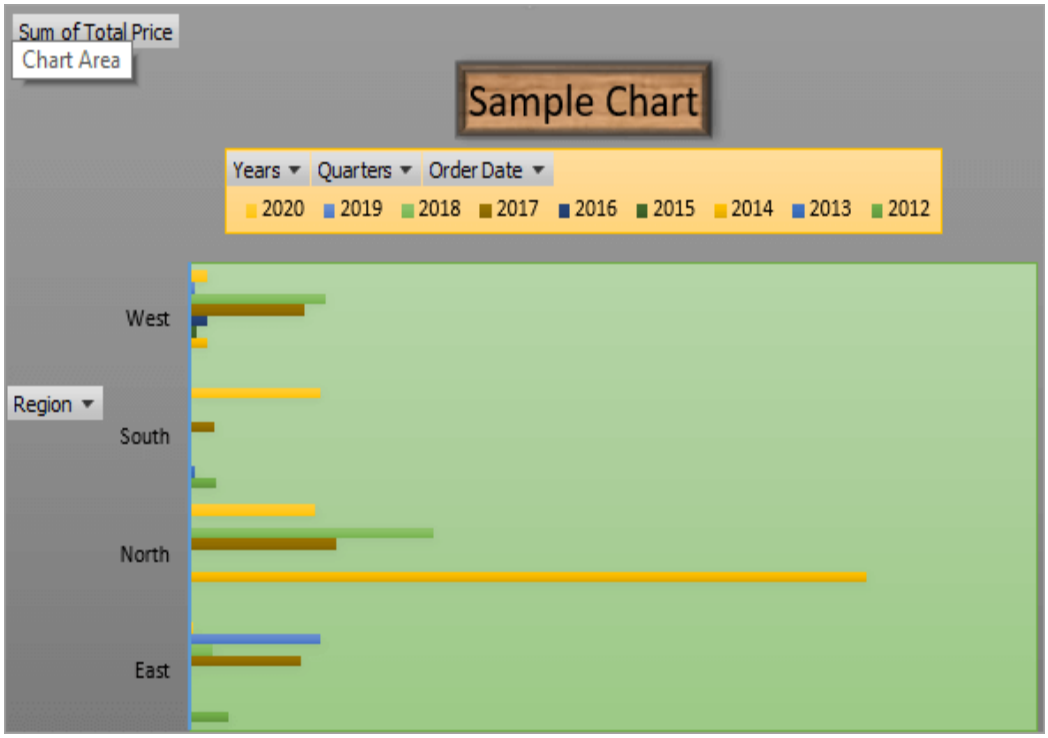
Reset to Match Style: This will reset all the changes and give the default style.

Insert Shapes: You can insert shapes like lines, arrows, and also a text box for a better explanation.

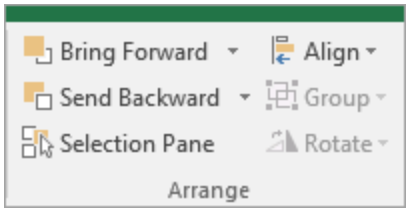


Shape Style: You can select different styles for the plot area. Select the area you want to change the style and click on the style.

After applying the styles to the entire chart, the Column and Rows are shown below.



Arrange: If there are multiple pivot charts and they are overlapping on one another on these options.



Bring Forward

- Select the chart you want to bring in front.
- Click on Bring Forward option to bring the chart one step forward.

Bring To Front: This option will bring your chart above all the other charts.

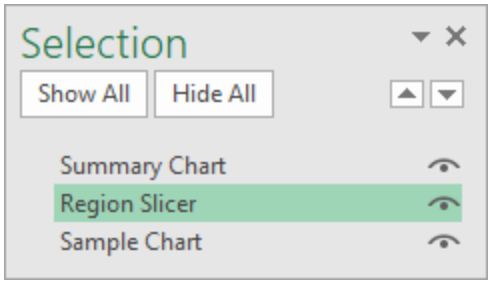
Send Backward

- Select the chart you want to send back.
- Click on the send backward option to send the chart one level back.

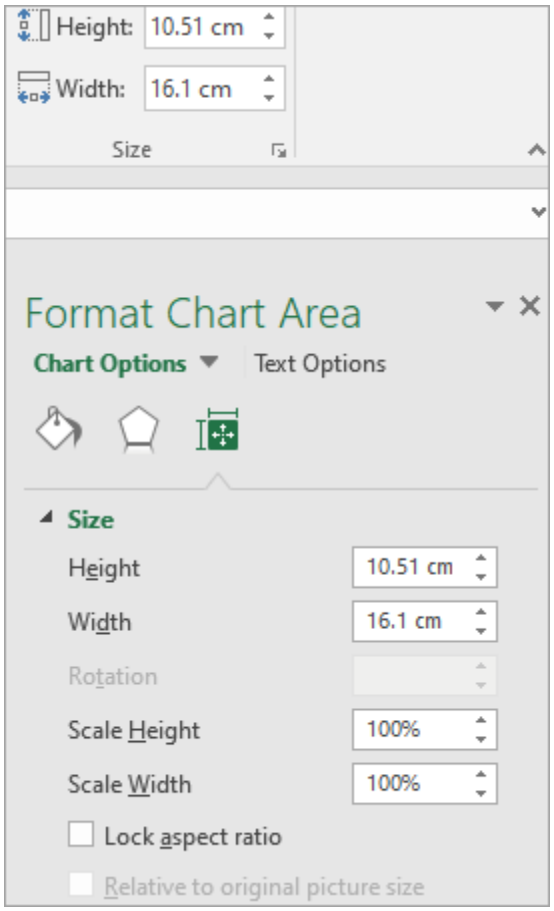
Send to Back: This is used to send the selected chart back to all the other charts.

Selection Pane

You can decide the visibility of the chart using the selection pane. This page shows you all the charts and slicer available and you can click on the eye icon to decide whether that particular item should be visible on the worksheet or not.



Size: This is used to customize the pivot chart height, width, scale height, scale width, etc.



6.7 Let us Sum Up

- A pivot table is *the most powerful and flexible* method of data analysis and synthesis available in Excel.
- PivotTable is a table that summarizes the data as sums, averages, and many other statistical measures.
- Expanding and collapsing levels of data to focus your results, and drilling down to details from the summary data for areas of interest to you.
- A pivot chart in Excel is a visual representation of the data. It gives you the big picture of your raw data.
- Pivot Table provides us a way to summarize large data in a grid-like matrix.

- Expand and collapse data show the underlying details that pertain to the values.

6.8 Review Questions

1. Distinguish between Pivot Chart And Standard Chart.
2. What is the purpose of data source in Creating Pivot Chart?
3. Define Pivot Table. List the advantages of it.
4. What are the different types of Pivot chart?
5. How the pivot chart can be created using Pivot Table?
6. Give various features of Pivot Chart.
7. What are the different functions performed on the Pivot Table?
8. How do you provide Dynamic Range in 'Data Source' of Pivot Tables?
9. Which option is used to add column(s) in Pivot Tables to compute the values in run-time?
10. Is it possible to make Pivot Table using multiple sources of data?

UNIT -7: APPLICATIONS OF MIS: MARKETTING FINANCIAL PRODUCTION PERSONNEL

STRUCTURE

UNIT 7: APPLICATIONS OF MIS: MARKETTING FINANCIAL PRODUCTION PERSONNEL

7.1.ROLE OF MIS IN GLOBAL BUSINESS

MIS plays a crucial role in almost all kinds of organizations irrespective of their size and nature of business. MIS has evolved from traditional electronic data processing (EDP) systems to highly integrated information systems (enterprise information systems like ERP, CRM, SCM). Many advances in IS/IT have led to a fundamental shift in the role of information systems. As already been mentioned, information systems play three vital roles for a business organization today. They support the business processes of an organization, decision-making by managers, and the strategies of an organization for gaining a competitive advantage.

MIS has changed the way organizations do business and has increased their efficiencies and responsiveness. Today, Internet-based and web-enabled systems and global e-business and e-commerce systems are becoming quite common in the operation and management of a business organization. The Information systems have played a major role in automating business transactions, and streamlining routine operations and have also helped organizations to make quick and well-informed decisions and thus enabling the organizations to have better intimacy with customers and suppliers. In view of the role, integrated MIS can play; organizations are implementing these systems to replace their old or legacy systems.

Let us try to understand the role of MIS in impacting the business globally.

7.1.1 Integration of functional areas

Integrated information systems play a very important role in integrating the various functional areas of a business organization. Because highly integrated information systems like ERP are designed on the premise of a common database and a common interface for all the functional areas and thus have the ability to automatically update data among related functions or activities. For example, when a customer places an order and the order is entered into the system (either online or offline), it triggers many actions across various departments or functional areas like inventory management; production planning; finance; marketing, and so on. The invoices are generated, the production schedule is planned, the inventory status is verified; the items, if not available in the stock, are ordered; and the customer is informed about the likely date of the delivery of the ordered item. All these actions are taken automatically and data updation happens instantaneously. This role of ERP in integrating various functional areas leads to improved responsiveness across the organization, and thus enables better decision-making and problem-solving in organizations. This, in turn, leads to reduced lead time (the elapsed time between placing an order and receiving it); reduced cycle time (the time between placing an order and delivery of the product); efficient use of resources; on time delivery of products; transparency; and overall customer satisfaction.

7.1.2 Reengineering of business processes

Highly integrated information systems like ERP Systems are process-oriented and one of the prerequisites for the implementation of ERP systems is business process re-engineering (BPR). Thus, ERP Systems force organizations to re-engineer or redesign their obsolete function-oriented business processes. To implement ERP systems, organizations have to either adopt ERP-based processes or modify ERP systems so as to match their existing business processes. Since ERP systems are designed and developed on the basis of the best practices of the industry, it is generally recommended to adopt ERP processes.

7.1.3 Standardization of systems and procedures

Highly integrated information systems, which are based on an integrated approach, enable an organization to follow standardized systems and procedures across the organizational units. This brings about consistency in the entire organization. This becomes all the more important for the organizations, which have either acquired other companies or got merged with some other company. ERP ensures that the new company after the acquisition or merger uses the same information systems throughout and follows similar procedures.

7.1.4 Networked Business

The integration of highly integrated information systems nowadays is extended beyond the boundaries of an organization leading to networking with the business partners of the organization like Supply Chain Management (SCM) systems; Customer Relationship Management (CRM) systems, etc. This network with the partners of the organization enables it to exchange electronically various business documents like purchase orders, sales orders, invoices, billing, etc. (Goyal, 2014)

7.2. MIS: ORGANISATION EFFECTIVENESS

Management Information System (MIS) should be designed to view the organization as discussed earlier. MIS design should give due weightage to the human side of the organization and its culture. The task and technology are the physical aspects of the organization which can be ascertained very easily. But culture and people are very difficult to assess from the design point of view. The structure of the five subsystems should be considered while designing the MIS. MIS design should give reports in line with the organization's structure. This means that the main decision-makers and the power centers must be recognized in the MIS. Let us discuss these aspects of the organization structure and their implications.

In a tall hierarchy with a high degree of centralization, the MIS should give control information to the higher management where decision-making is concentrated. If the system is structured on a functional basis where the functional head is a key decision-maker and all the functions have equally important roles to play, then the MIS will have a functional design with the information support to the functional head. Further, in such a set-up, an integrated MIS would be necessary, reporting the corporate status of the business to the top management.

If the organization works on a standardized system where rules, policies, systems, and procedures have been laid down, then these become part of the MIS. The processing routines in the MIS incorporate these features as an integral part. This is safe as it has already been approved by the management of the organization. Along with the information, if the decision-making responsibilities are also clearly defined and allocated, then the MIS can produce information reports by processing the data and summarising the results in line with the decision-makers position in the structure.

If the basic model of the organisation is modified as a product or a project organisation system, then the MIS should focus on the management of product or project where the concerned manager has a composite responsibility of planning and control of the multiple functions Management Information Systems in a Digital Firm.

Besides these functions, he has to know the status of the other support functions. The information should be such that it highlights the trouble spots and shows the interconnection with the other functions. It must summarise all information relating to the span of control of the product or project manager. The MIS should be able to cater to the view of the product or the project manager and also of the top management

If the organisation's culture provides sufficient incentive for reticence and results, the MIS should support this culture by providing information that will aid the promotion of efficiency. If the culture encourages delegation of power and authority, then the MIS should incorporate the decision maxing rules in the system.

The organization system is an open system and MIS should be so designed that it highlights the critical business, operational, technological, and environmental changes to the concerned level in the organisation, so that action can be taken to correct the situation. The principle of the feed-forward control should be extensively used as a design feature to provide a prior warning to the decision-maker.

Since the organization system has a dynamic role to play to meet the changing needs of a business, the MIS becomes a common support system for playing the dynamic role. When the organisation is moving through the business phases of introduction, growth, maturity, and decline, MIS should provide information support, relevant to that phase of the business cycle. This means the designer of MIS should foresee such requirements and make the design flexible enough to support such requirements

Organizational learning helps to tone up the behavior of the organization. The MIS should support the learning mechanism by identifying the cause and effect in a given situation. It should keep the records of action and provide help to analyze the best action in a given situation. It should help to build various decision models for use by the managers. The information support should be such that the group of enterprising managers should be able to improve their capabilities to perform better.

The design of the MIS, in isolation from organizational factors, is destined to fail as it just does not fit into the structure. Since organization systems in the same business differ for various reasons such as the leadership style, the management style, culture and group of

people as a body, and so on, it is difficult to evolve a standard model of the MIS for a business and /or an industry.

MIS plays a very important role in creating organizational behavior which in turn sets the goals for achievement. Technology and people decide the organization's structure and style of management, Figure explains the impact and relationship of MIS on the organisation.

7.3. BENEFITS OF MANAGEMENT INFORMATION SYSTEM

- **Aid in Decision Making** - MIS can generate synthesized and processed information from computerized/ automated and certain manual systems. Information distribution to all levels of corporate managers, professionals, and key executives becomes quite seamless with streamlined MIS. Managers are able to make quick, timely, and informed decisions. Top management and board members can take strategic decisions, and plan future growth and business expansion activities based on the data and information generated by MIS.
- **Better Planning and Control** - MIS is designed and managed in such a way that it aggregates information, monitors the company's activities and operations and enhances communication and collaboration among employees. This ensures better planning for all activities and better ways to measure performance, manage resources and facilitate compliance with industry and government regulations. Control helps in forecasting, preparing accurate budgets and providing the tools and vital information to employees, top management and business partners.
- **Core Competencies** - MIS provide the tools necessary to gain a better understanding of the market as well as a better understanding of the enterprise itself. Every market leading enterprise will have at least one core competency - that is, "a function they perform better than their competition". By building an exceptional management information system into the enterprise it is possible to push out ahead of the competition.
- **Quick Reflexes** - As a corollary to improved supply chain management comes an improved ability to react to changes in the market. Better MIS enables an enterprise to react more quickly to their environment, enabling them to push out ahead of the competition and produce a better service and a larger piece of the pie.
- **Enhance Supply Chain Management** - Improved reporting of business processes lead inevitably to a more streamlined production process. With better information on the production process, comes the ability to improve the management of the supply chain, including everything from the sourcing of materials to the manufacturing and distribution of the finished product.

7.4. MANAGEMENT INFORMATION SYSTEM FOR A DIGITAL FIRM

Twenty-first-century organizations are E-Enterprises, that run their major operations on the Internet/WEB and WAN, spread over a large area.

The term 'E-Business enterprise' was coined to convey the use of the Internet and IT in key resource management processes and to transact business with customers, suppliers, and business partners. ERP, SCM, CRM, PLM, and homegrown legacy systems are the main applications in the business. The application of the Internet and information technology is in key core areas of business. These technologies are used for computing, collaboration, communication, and storage of information in all kinds of formats. These applications however did not integrate the entire cycle of business starting *from Customer to finishing at Customer: Customer Ordering to Delivery to Customer Service'.*

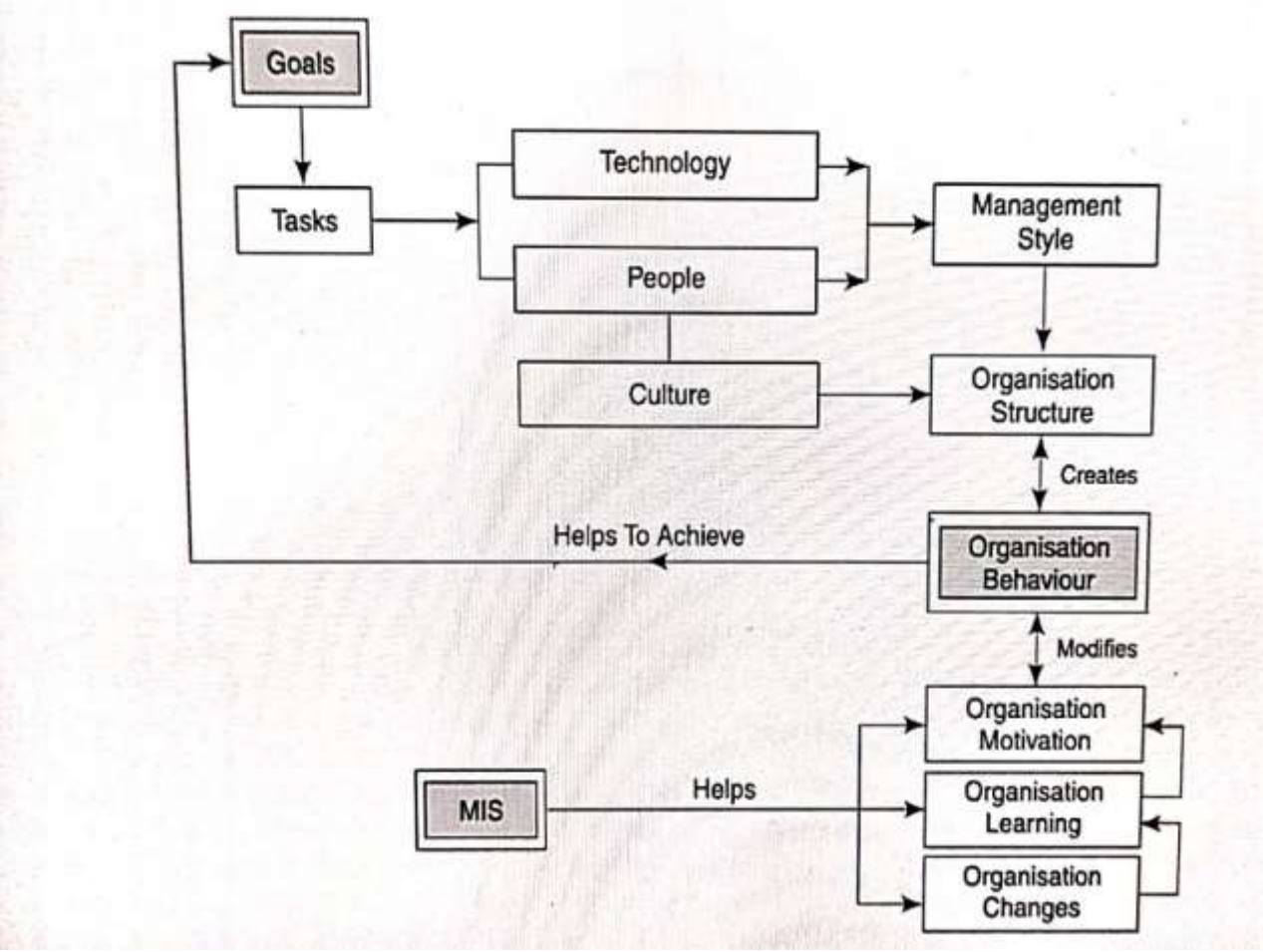


Figure- Organizational Behaviour and Management Information System

With the advancement of the Internet, Web communication and network and Information technology, business process management crossed the boundaries of the organization and embraced every aspect of the business making all its operations 'Digital'. That is capturing the data or event, validating, processing, decision making, storing, and delivering. The extent of use of these technologies is so much across the boundaries of the organisation that E-Business enterprise has become completely digitalized all its operations, and hence is now called as a "Digital Firm".

Digital describes electronic technology that generates, captures, validates and stores, and processes data in terms of two states: positive and non-positive, Positive is expressed or represented by the number 1 and non-positive by the number 0. Digital firms use extensively

computing, convergence, and content management technologies on internet platform for all business processes, transactional and relational. Digital firms rely heavily on Internet and Information technology to conduct the E- business operations. The complete change over to digital platform makes organisation and its activities more flexible, profitable, competitive and efficient than traditional people, paper and process driven organisation.

Going digital has a clear strategic advantage for the firm and its stakeholders. Supply chain management systems, customer relationship management systems, enterprise management established infrastructure such as branch office, zonal office. Allow people to work from anywhere. Automate processes after reengineering to cut down process cycle time

Another challenge is to convert domestic process design to work for international processes, where integration of multinational information systems using different communication standards, country-specific accounting practices, and laws of security are to have adhered to strictly.

Internet and networking technology have thrown another challenge to enlarge the scope of an organization where customers and vendors become part of the organization. This technology offers a solution to communicate, coordinate, and collaborate with customers, vendors, and business partners. This is just not a technical change in business operations but a cultural change in the mindset of managers and workers to look beyond the conventional organization. It means changing the organization's behavior to take competitive advantage of Digital technology.

The last but not least important, is the challenge to organise and implement information architecture and information technology platforms, considering multiple locations and multiple information needs arising due to global operations or the business into a comprehensive MIS.

7.5. APPLICATION OF MANAGEMENT INFORMATION SYSTEM

With computers being as omnipresent as they are today, there's hardly any organization that does not rely on the IT systems.

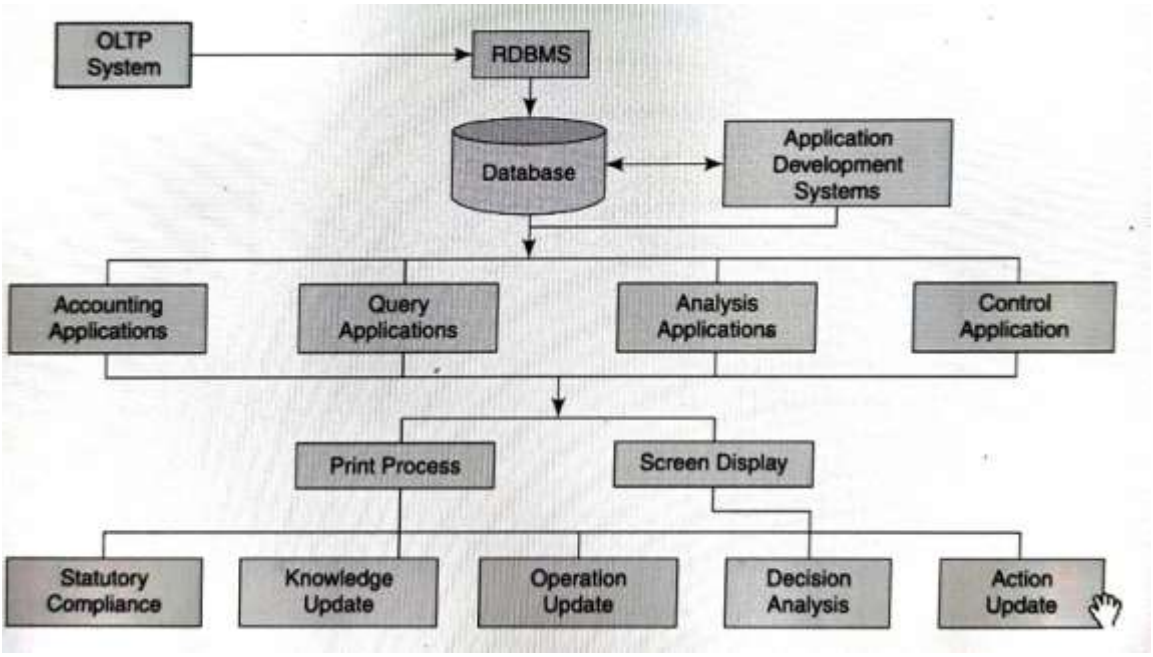
- **Strategic Support** - Computers cannot create business strategies by themselves. They can assist management in understanding the effects of their strategies, and help enable effective decision-making. MIS provides a valuable function; they can collate into coherent reports unmanageable volumes of data that would otherwise be broadly useless to decision-makers. By studying these reports decision-makers can identify patterns and trends that would have remained unseen if the raw data were consulted manually. MIS can provide financial statements and performance reports to assist in the planning, monitoring, and implementation of the strategy.
  MIS can also use these raw data to run simulations - hypothetical scenarios that answer a range of what-if questions regarding alterations in strategy. For instance, MIS can provide predictions about the effect on sales that an alteration in price would have on a product. These Decision Support Systems (DSS) enable more informed decision-making within an enterprise than would be possible without MIS systems.

- **Management by Objectives** - MIS is extremely useful in generating statistical reports and data analysis they can also be of use as a Management by Objectives (MBO) tool. MB is a management process by which managers and subordinates agree upon a series of objectives for the subordinate to attempt to achieve within a set time frame. Objectives are set using the SMART ratio, that is, objectives should be Specific, Measurable, Agreed, Realistic and Time-Specific.
  The aim of these objectives is to provide a set of key performance indicators by which an enterprise can judge the performance of an employee or project. The success of any MB objective depends upon the continuous tracking of progress. In tracking this performance, it can be extremely useful to make use of the MIS. Since all SMART objectives are by definition measurable, they can be tracked through the generation of management reports to be analyzed by decision-makers.
- **Data Processing** - Not only do MIS allow for the collation of vast amounts of business data, but they also provide a valuable time-saving benefit to the workforce. Where in the past business information had to be manually processed for filing and analysis it can now be entered quickly and easily onto a computer by a data processor, allowing for faster decision making and quicker reflexes for the enterprise as a whole.

7.6. APPLICATIONS IN THE MANUFACTURING SECTOR

This is an introduction to the business applications of Management Information systems. It gives an overview of the application and does not give small details which may be specific to a typical organization. The approach to the application development is on the basis of database and not the conventional file system. The MIS model of an application considers transaction processing as a basis. The online transaction processing system develops data for DBMS and the application development is based on such a database. The model of the information processing system is given in the Figure.

Model of Information Processing System



For each application, inputs, are processed by online transaction processing (OLTP), and systems are determined. The system designer develops the applications with the objective of accounting for the transaction-based results and providing reports on the same. The second objective is to provide a Query system for assessment of the status of record, result, or document. The system provides an on-the-spot screen display showing a status, such as the stock of an item, the balance of an account, the position of the purchase order, and so on. The third objective is to provide a system of analysis of processed data revealing certain business trends or results. It is supposed to give a certain analytical assessment of the event which will throw light on the validity of decisions, policies, and rules. It is also supposed to provide certain guidelines and norms for strategic and tactical planning.

The analytical information provides support for decision-making in the Decision Support System (DSS). The analysis system provides funds of information at all levels for planning and execution of business operations. The fourth objective is to provide control information to ensure that the business runs as per the plan, progresses in a set direction, and achieves the goals.

The control information is generated by using the standards, norms, targets, and bud, The actual results are compared with these entities, and exceptions are highlighted. Whenever possible, the information is provided on the basis of feed-forward control, i.e., providing an early signal of probable adverse conditions or results. The designer of business applications focuses the development on the aspect of accounting, querying, analysis and control.

The report generation is decided on the basis of certain business information needs. These needs are statutory compliance, Knowledge update, operation management, decision analysis, control, and action. The reports are designed for screen display or for print. The contents of the reports are decided as per users of the information. The frequency, duration and coverage of the report are decided as per the user requirements.

A typical information system begins with OLTP System, uses RDBMS for the creation of Database, 4 GL for application development, and SQL for querying and report generation. It uses a program for complex data processing and report generation. It uses business models, accounting, and commercial principles for processing the information leading to business results. The information system is designed on the principle of open system design, providing flexibility and friendliness to the users of the system.

A typical information system primarily serves the needs at function levels such as Personnel, Finance, Production, Materials, Marketing, and Corporate Business Management. These systems when integrated provide cross-functional information to management high- lighting the business implications of the decisions taken in one area of the business or the other. Integrated systems provide data and information for business planning at the middle management level and for strategic planning at the top management level.

7.7. INFORMATION SYSTEM AND COMPETITIVE ADVANTAGE

A business organization generally operates in a competitive environment and thus has competitors (rivals) in the industry, in which it operates. In order to survive, grow, and to

become an industry leader, an organization has to make strategies or in other words, has to align itself with its environment. Information Systems support the strategies of an organization and thus help an organization in achieving competitive advantage. However, until recently, information systems played only a limited role. It is in the last three decades that there has been a revolutionary change in the use of information and information systems in organizations. Today, a large majority of organizations use information and information systems not merely for operational efficiency; rather as a strategic resource for gaining competitive advantage. The latest advancements in information technology such as the Internet and telecommunication technology further enhanced the capabilities and strategic capabilities of information systems. Nowadays, many organizations, especially the service industry such as Banking, Airlines, Retail, etc. use information systems extensively and on real-time basis and thus cannot afford these systems down even for a few minutes. Such systems help organizations to meet the needs of competitive necessity and also to gain competitive advantage. The growing use of information systems may largely be attributed to the changing concept of the role of information in organizations. The concept of Information has evolved from a necessary evil in the past to that of a strategic resource of today. Let us understand the evolving role of information so as to understand its relevance in today's organizations.

7.8. CHANGING ROLE OF INFORMATION SYSTEM

The changing role of information and information systems is briefly discussed under following, subsections.

7.8.1. Information as a Necessary Evil

Information was regarded as a necessary evil, associated with the development, production as marketing of products or services. Information was thus merely considered as a by-product. transactions in the organizations. As a result, information systems of the 1950s were primarily, designed with the aim to reduce the cost of routine paper processing in accounting areas. The term "Electronic Data Processing (EDP)' was coined in this period.

7.8.2. Information for General Management Support

By mid-sixties, organizations began recognizing information as an important tool which could support general management tasks. The information systems corresponding to this period were known as Management Information Systems (MIS) and were thought of as systems processing data into information.

7.8.3. Information for Decision-making

In the early-eighties, information was regarded as providing special-purpose, tailor-made management controls over the organization. Decision Support Systems and Executive Support Systems were important advancements, which took place during this period. The purpose of such information systems was to improve and speed-up the decision-making process of top-level managers.

7.8.4. Information as a Strategic Resource

In the revolutionary change pattern, the concept of information changed again by the mid-eighties and information has since then been considered as a strategic resource, capable of providing competitive advantage or a strategic weapon to fight the competition. Latest information systems, which are known as strategic systems, support this concept of information.

Changing concepts of information systems

Time Period	Concept of Information	Information	Aims of Information System
1950-65	Necessary Evil, A by-product	Electronic Data, A by-product	Fast Paper Processing
1966-70	General Purpose Support	Management Reporting System	Speedy General Report Requirement
1971-85	Specific Management Control Support System	Decision Support Systems, Executive	Decision Making Improvement, Tailor-made
1986	Strategic Resource, Competitive Weapon	Strategic Informal Systems	Promote Survival and Growth of Organisation

The table above portrays the changing concepts of information and information systems in organizations.

Information and information systems can be used to gain and sustain competitive advantage in organizations. In order to understand how information systems can be used to gain and sustain competitive advantage, let us understand the concept of competitive advantage and the models for analyzing competitiveness.

7.9. INFORMATION SYSTEM ACTIVITIES

Regardless of the type of information system, the same basic information system activities occur. Let's take a closer look now at each of the basic data or information processing activities. You should be able to recognize input, processing, output, storage, and control activities taking place in any information system you are studying. Figure lists business examples that illustrate each of these information system activities.

Business examples of the basic activities of information systems.

Information System Activities
• **Input.** Optical scanning of bar-coded tags on merchandise. • **Processing.** Calculating employee pay, taxes, and other payroll deductions. • **Output**. Producing reports and displays about sales performance. • **Storage.** Maintaining records on customers, employees, and products. • **Control.** Generating audible signals to indicate proper entry of sales data.

7.9.1. Input of Data Resources

Data about business transactions and other events must be captured and prepared for processing by the input activity. Input typically takes the form of data entry activities such as recording and editing. End users usually enter data directly into a computer system or record data about transactions on some type of physical medium such as a paper form. This entry includes a variety of editing activities to ensure that they have recorded the data correctly. Once entered, data may be transferred onto a machine-readable medium, such as a magnetic disk, until needed for processing.

For example, data about sales transactions may be recorded on source documents such as paper order forms. (A source document is the original, formal record of a transaction.) Alternatively, salespersons might capture sales data using computer keyboards or optical scanning devices; they are visually prompted to enter data correctly by video displays. This method provides them with a more convenient and efficient user interface, that is, methods of end-user input and output with a computer system. Methods such as optical scanning and displays of menus, prompts, and fill-in-the-blank formats make it easier for end users to enter data correctly into an information system.

7.9.2. Processing of Data into Information

Data are typically subjected to processing activities, such as calculating, comparing, sorting, classifying, and summarizing. These activities organize, analyze, and manipulate data, thus converting them into information for end users. The quality of any data stored in an information system also must be main- tined by a continual process of correcting and updating activities.

Example. Data received about a purchase can be (1) *added* to a running total of sales results, (2) *compared* to a standard to determine eligibility for a sales discount, (3) *sorted* in numerical order based on product identification numbers, (4) *classified* into product categories (e.g., food and non-food items), (5) *summarized* to provide a sales manager with information about various product categories, and finally (6) used to *update* sales records.

7.9.3. Output of Information Products

Information in various forms is transmitted to end users and made available to them in the output activity. The goal of information systems is the production of appropriate information products for end users. Common information products include messages, reports, forms, and graphic images, which may be provided by video displays, audio responses, paper products, and multimedia. We routinely use the information provided by these products as we work in organizations and live in society. For example, a sales manager may view a video display to check on the performance of a salesperson, accept a computer-produced voice message by telephone, and receive a printout of monthly sales results.

7.9.4. Storage of Data Resources

Storage is a basic system component of information systems. Storage is the information system activity in which data are retained in an organized manner for later use. For example, just as written text material gets organized into words, sentences, paragraphs, and documents, stored data are commonly organized into a variety of data elements and databases. This organization facilitates their later use in, Data Resource Management processing or retrieval as output when needed by users of a system.

7.9.5. Control of System Performance

An important information system activity is the control of system performance. An information system should produce feedback about its input, processing, output, and storage activities. This feedback must be monitored and evaluated to determine whether the system is meeting established performance standards. Then appropriate system activities must be adjusted so that proper information products are produced for end users.

For example, a manager may discover that subtotals of sales amounts in a sales report do not add up to total sales. This conflict might mean that data entry or processing procedures need to be corrected. Then changes would have to be made to ensure that all sales transactions would be properly captured and processed by a sales information system.

7.10. ACCOUNTING INFORMATION SYSTEM

Accounting is one of the significant activities in any business. Accounting is mainly concerned with the collecting, recording and evaluation of financial data and then, communicating this information to the management and other people. It is viewed as an information system since it has inputs (financial data), processes (evaluation of data) and outputs (financial statements). All organizations need systematic maintenance of their records that help in the preparation of the financial statements such as Profit & Loss account and Balance sheet

Operational accounting systems emphasize legal and historical record-keeping and the production of accurate financial statements. Typically, these systems include transaction processing systems such as order processing, inventory control, accounts receivable, accounts payable, payroll, and general ledger systems. Management accounting systems focus on the planning and control of business operations. They emphasize cost accounting reports, the

development of financial budgets and projected financial statements, and analytical reports comparing actual to forecasted performance.

7.10.1 Online Accounting Systems

It should come as no surprise that accounting information systems are being transformed by Internet technologies. Using the Internet and other networks changes how accounting information systems monitor and track a business activity. The interactive nature of online accounting systems calls for new forms of transaction documents, procedures, and controls. This particularly applies to systems like order processing, inventory control, accounts receivable, and accounts payable. As outlined in Figure 3.17, these systems are directly involved in the processing of transactions between a business and its customers and suppliers. So naturally, many companies are using the Internet and other network links to these trading partners for such online transaction processing systems, as discussed in Section I. Figure 3.19 is an example of an online accounting report

There are 3 general types of Accounting Information Systems:

- **Financial Accounting System:** This system provides financial statements to investors, governmental authorities, and other interested parties in accordance with their reporting formats.
- **Management Accounting System:** It provides reports to managers both, for strategic and tactical decisions and on profitability of the organization.
- **Cost Accounting System:** It provides reports to managers for cost planning and cost control of operations.

All the above three types of accounting information systems process the same accounting transactions and often share the data files. Therefore, an accounting information system is generally developed as an integrated system providing all the report of the above three types. Many types of account books and financial statements can be generated by a financial accounting system. In manual system of accounting, maintaining of account books in a prescribed manner is called Book Keeping, while preparation of financial statements based on the account books is called financial accounting.

However, in computerized system of accounting, no such distinction is found and a financial accounting system generates both account books and financial statements.

The major types of account books are:

(a) Voucher. A transaction is recorded by debiting and crediting the two affected accounts, called a voucher.

(b) Journal: It is an account book in which all the transactions are recorded in a chronological order (i.e., date wise). It is maintained only in manual system by entering information from vouchers and is not required in computerized systems.

(c) General ledger: All the accounts are recorded and maintained individually in a book called general ledger or simply ledger. In manual system of accounting, the ledger is prepared by entering information from the journal by a process called posting while in computerized system, the data of vouchers (input) is processed to prepare a ledger (output).

(d) Purchase book: The purchase of goods on credit basis is recorded in another special ledger called purchase book.

(e) Sales book: The credit sales of goods are recorded in a special ledger called sales book.

(f) Cash book: Cash book is a special type of ledger in which only cash transactions are recorded and maintained.

(g) Bank book: Bank book is another type of ledger in which only bank transactions are recorded and maintained.

(h) Creditor's ledger: The transaction (credit purchases) of all the creditors are recorded and maintained in creditor's ledger.

(i) Debtor's ledger: The transactions (credit sales) of all the debtors are recorded and maintained in debtor's ledger.

After preparation of all the above accounts, the final statements of accounts are generated periodically (monthly or yearly). The major financial statements are as follows:

(a) Trial balance: It is a list or financial statement prepared monthly, quarterly or annually to find out the balance at each accounting a trial balance all debtors am shown on one side while all creditors are shown on the other. The total of debit balance must match the total of the credit balance.

(b) Trading account: It is a financial statement prepared yearly to find out the gross profit or gross loss of the organization.

(c) Profit and loss account: After preparation of trading accounts, a financial statement called Profit & Loss account 15 generated to find out the net profit or net loss of the organization.

(d) Balance sheet: The balance sheet is the most important financial statement of the company that shows its position of assets and liabilities on a particular date (generally at the end of the accounting year).

(e) Accounts receivable statement: This statement lists the name of the debtors and, the amounts to be received by the company.

(f) Account payable statement: This statement lists the name of the creditors and, the amounts to be paid by the company.

7.11. A TYPICAL FINANCIAL ACCOUNTING SYSTEM

The major objectives for implementing a computerized financial accounting system for an organization are:

- Preparation of a general ledger
- Maintaining account books
- Generating Profit & Loss account and Balance sheet

- Generating updated financial data for other systems
- Generating accounts receivables & accounts payable statements

The various inputs to the system are:

- Cash vouchers
- Bank vouchers
- Journal vouchers
- Purchase vouchers or bills from vendor/suppliers
- Sale vouchers or bills to customers

A typical financial accounting system generates the following outputs:

- Account books (cash book, bank book, journal general ledger, purchase book, sales
- book)
- Trial balance
- Trading account
- Profit & loss account
- Balance sheet
- Accounts payable statement
- Accounts receivable statement

A typical Accounting Information System includes financial accounting, cost accounting and management accounting systems. The major objectives of an accounting information system are:

- Preparation of account books and financial statements
- Generation of MIS reports

The various inputs to the system are:

- Updated financial data from general ledger and accounts
- Updated purchase data from inventory system
- Updated production data from production planning and control system
- Updated sales data from invoicing system
- Receivable/ payable system
- Updated pay data from payroll system

A typical accounting information system generates the following:

- Account books i.e., cash book, bank book, sales book, purchase book, journal and general ledger
- Financial statements i.e., trial balance, trading accounts, profit & loss account, balance sheet, accounts receivable statement and accounts payable statements
- MIS reports i.e., cost analysis, forecasting and funds management reports (Gupta, 2011) (Gupta, 2011)

7.12. FINANCIAL MANAGEMENT SYSTEM

Computer-based financial management systems support business managers and professionals in decisions concerning (1) the financing of a business and (2) the allocation and control of financial resources within a business. Major financial management system categories include cash and investment management, capital budgeting, financial forecasting, and financial planning.

For example, the capital budgeting process involves evaluating the profitability and financial impact of proposed capital expenditures. Long-term expenditure proposals for facilities and equipment can be analyzed using a variety of return on investment (ROI) evaluation techniques. This application makes heavy use of spreadsheet models that incorporate present value analysis of expected cash flows and probability analysis of risk to determine the optimum mix of capital projects for a business.

Financial analysts also typically use electronic spreadsheets and other financial planning software to evaluate the present and projected financial performance of a business. They also help determine the financing needs of a business and analyze alternative methods of financing. Financial analysts use financial forecasts concerning the economic situation, business operations, types of financing available, interest rates, and stock and bond prices to develop an optimal financing plan for the business. Electronic spreadsheet packages, DSS software, and Web-based groupware can be used to build and manipulate financial models. Answers to what-if and goal-seeking questions can be explored as financial analysts and managers evaluate their financing and investment alternatives (Ramesh Behl, 2019).

7.12.1. FINANCIAL INFORMATION SYSTEM

Financial information system is a sub-system of organizational management information system. This sub-system supports the decision-making process of financial functions at the level of an organization. The basic financial decisions, which an organization usually takes, may include the following.

(i) Where to invest funds and to what extent?

(ii) Where to raise funds and what amount?

(iii) How much to pay in dividends (in case, it is a public company)?

A brief description of each of the financial decisions, that a financial manager has to take, is given below.

- ***Capital budgeting decision*** In this decision, funds are allocated to long-term assets which would yield benefits/returns in the future. For example, funds allocated for land, building machinery, etc. Before committing funds, it is very important for the financial manager bto evaluate the prospective profitability of the new investment.
- ***Financing decision*** It relates to when, where and how to acquire funds to meet the investment needs of the organization. The financial manager has to decide about the proportion of equity capital and debt capital. He has to determine areas where the use

of debt capital affects the return and poses a risk to shareholders, The return on equity may increase, but so will the risk. Thus, a proper balance will have to strike between return and risk.

- ***Dividend decision*** This decision relates to the dividend policy of the organization. A decision whether the organization should distribute all profits or retain them or distribute a portion and retain the balance, has to be taken by the financial managers.
- ***Current asset management*** in order to safeguard the organization against illiquidity or insolvency, current assets of the organization are also required to be efficiently managed Investment in current assets affects the organization's profitability, liquidity and risk. If sufficient funds are not invested in current assets, the organization may become illiquid. But it would lose profitability as idle current assets would not car any profits. Thus, a suitable trade-off is needed to be achieved between profitability and liquidity.

Besides the above-mentioned managerial functions, the other functions of financial systems may be summarized as below.

- Controlling the receipt and payments
- Maintaining statutory records
- Preparation of periodic reports for statistics, performance and results for internal control and audit

Financial systems also include accounting systems as these systems are concerned with recording the transactions of the business, such transactions may include wages and salaries, purchases, sales and all other types of income and expenditure. Obviously, records of these transactions become the basis for the preparation of periodic or annual profit and loss accounts, balance sheets, etc.

In order to perform the above activities and functions, financial information that is accurate, precise and timely has to be supplied to the financial manager. These systems involve large amounts of data, concerned primarily with historical and internal information. However, in some areas of financial planning, it is future-oriented also. For example, the exercise of budgeting is wholly futuristic in nature.

Financial information systems are computerized:

- To improve the speed and accuracy of reporting
- To provide information and analytical support to financial managers to aid them in their decision-making. Figure illustrates a financial information system.

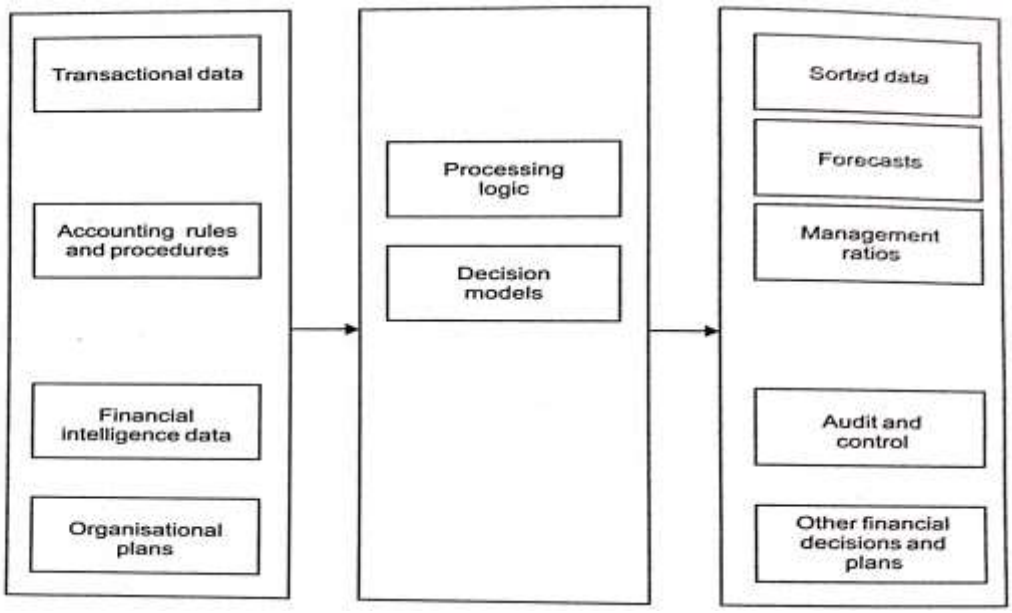


Figure- Financial Information System

- *Transactional data* is the basis of any type of analysis. This data may include credit applications, billing, payment vouchers, stock transfers, cheques, journal and ledger entries, etc.
- *Financial intelligence data* is collected from banks, government, stock markets, etc., which is processed to determine its impact on the organizational economy.
- *Organizational plan* is another important input in the financial information system, as it portrays the objectives of the organization. This needs to be reflected in the output of the financial information system, which may be in the form of financial plans.

Many software packages on financial accounting are available in the market, which provide complete financial accounting. Tally, BMS, etc., are the more common packages. Financial planning software (e.g., IFPS, etc.) packages are used for managerial decision-making at higher levels.

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UNIT -8: DECISION SUPPORT SYSTEM: CONCEPTS AND FEATURES MIS VS. DSS, TOOLS AND MODELS FOR DECISION SUPPORT GROUP DECISION SUPPORT SYSTEM

STRUCTURE

UNIT 8:- DECISION SUPPORT SYSTEM: Concepts and Features MIS vs. DSS, Tools and Models for decision support Group Decision support system.

8.1. Introduction

While understanding management as a component of management information system, we have advocated that decision-making is the essence of management. In other words, whatever a manager does in an organization, he/she does it through decision-making. That is why, decision-making is regarded as the core of managerial functions. MIS assists every manager/ decision-maker in providing the required information, which is vital and an essential input in any kind of decision-making.

Decision-making is no longer based on the creativity, intuition, and/or experience of a manager or rule of thumb approach; rather today's manager has to operate, under ever-increasing complexities of business as well as that of management. It is more difficult to make decisions for several reasons. For example, the number of available alternatives is much larger than ever before because of improved technology and communication systems. Secondly, any wrong decision may be very costly because of the complexity and magnitude of operations, automation, and the chain reactions that it can cause in an organization. Thirdly, the environment today is more dynamic, and finally, the ever-increasing competition forces managers to act fast and take quick decisions. The important factors and their effect on decision-making are listed in the table below:

FACTORS	EFFECT
More complexity in IT	More alternatives
Increased organizational complexity	High cost of wrong decisions
Presence of globalization, less political stability, high government intervention	More uncertainty
More changes fluctuations	Need for quick decisions

In order to cope with such a situation, today's manager must understand the decision-making process; decision situations; application of new tools and techniques; and the applications d computerized support systems in their decision-making. Let us first discuss the concept of decision-making.

8.2. DECISION-MAKING: A CONCEPT

Literally speaking, decision-making has been taken from the word 'decide', which is a Latin word meaning "to cut off" or 'to come to a conclusion. The decision may be regarded as a 'choice'" whereby a decision-maker comes to a conclusion about a given situation. A decision represents a course of behavior selected from a number of (more than one) possible alternatives. Decision-making, on the other hand, is a process of selecting one optimum alternative from among alternatives of a course of action. Thus, a decision is an end or the final product of the decision-making process. However, the decision should not be mistaken here as an end in itself, rather it is regarded as a means for action. Decisions are not static and have to be responsive to varying situations. In fact, decision-making means, choosing one course of action rather than another and finding an appropriate solution to a new problem posed by a dynamic world'. It is implied that decision-making envisages two or more alternatives from which a final decision can be made. However, if there is no option, i.e. only one alternative is available, there is no decision to be made. In organizations, some of the decisions can be made easily with a minimum of mental effort but in most cases, decision-making becomes a complex issue, broader than merely making a commitment after evaluating alternatives. It involves the entire process of establishing goals, defining activities, searching for other options, and developing plans. It includes all the activities of coordinating, information processing, problem-solving, and evaluating that usually precede a decision.

8.2.1. Decision Support Systems - Why?

Having discussed the conceptual framework for decision-making, let us now understand the need for computerized decision support systems. These systems have become necessary for today's managers because of the following reasons:

i. ***Fast computation:*** A decision-maker can perform a large number of computations very quickly and that too at a low cost with the help of computer support systems. Today, in the majority of decisions, time is of the essence.

ii. ***Enhanced productivity:*** Support systems can enhance the productivity of support staff and also enable the group members to discuss the problems among themselves at a distance.

iii. ***Data transmission:*** Sometimes the data, which may be stored at different locations, may be required to be transmitted quickly from distant locations. Computer support systems can search, store, and transmit the required data quickly and economically.

iv. ***Better decisions:*** Computer support systems can help a decision-maker in arriving at a better decision. For example, more alternatives can be evaluated, risk analysis be performed quickly, and views of experts from different places can be collected quickly and at a lower cost.

v. ***Competitive edge:*** Decision support systems enable the users to get a competitive edge over their competitors as these systems enable organizations to change their operations frequently, re-engineer processes and structures, empower employees and innovate. Decision support technologies can create useful empowerment by allowing people to make good decisions, even if they lack some knowledge.

In view of the above-stated reasons, decision support systems are important tools in the hands of decision-makers, which come in handy, especially in their semi-structured to unstructured problems.

8.2.2. Decision Support Systems - What?

Decision support systems like MIS have also been defined differently by different people and thus there is no universally accepted definition of DSS. It was in the early 1970s, when Scolt Morton put forward the concept of DSS and defined DSS as an interactive computer-based system, which helps decision-makers utilize data and models to solve unstructured problems, and thereafter many other scholars like Little (1970), Alter (1980), Moore and Chang (1950), Keen (1950), etc, have defined the concept in different ways. However, the focus of all these definitions has been on the 'what' aspect, i.e. what a DSS does and how aspect, i.e. how the objectives of DSS can be achieved. For the purpose of this book, we understand the definition of DSS as follows:

"A decision support system is a specialized kind of information system, which is an interactive system that supports in the decision-making process of a manager in an organization, especially in semi-structured and unstructured situations. The system utilizes information, models, and data manipulation tools to help make decisions in semi-structured to unstructured situations."

8.3. COMPONENTS OF DECISION SUPPORT SYSTEM

A decision support system comprises three main components:

- **Database**

  The data in the database typically is a combination of master files (internal corporate data) and data from external sources. Because of the large size of the data, data warehouse is used for handling huge data.

- **Model base**

  The second component of the DSS is a library of models to manipulate and analyse the data in the desired ways. The model base might include econometric models to forecast demand by industry and simulation models of the corporation. It may also have data mining tools to extract trends and patterns.

- **Dialogue box**

  A user interface is the third component. Through this, the user can communicate with the DSS. The physical interface generally consists of a terminal hooked up to the mainframe computer, either directly or by telephone. Micro-computers with modems are being used ever more frequently for this interface. These elements are illustrated in Figure .

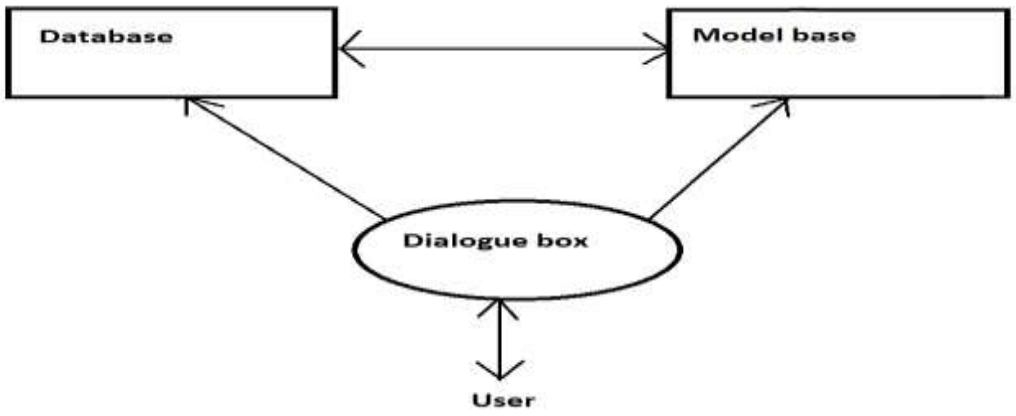


Figure -Components of a Typical DSS

8.4. CHARACTERISTICS AND CAPABILITIES OF DSS

Decision support systems, as the name implies, support the decision-making process of a manager and thus should be able to provide the required support in the decision-making process.

Accordingly, decision-support systems are understood to have the following characteristics and capabilities. These have also been depicted in Figure

1. DSS provide support for decision-makers mainly in semi-structured and unstructured situation by bringing together human judgements band computerized information. Such problem cannot be solved (or cannot be solved conveniently) by other information systems.

2. Support is provided for various managerial levels, ranging from managers at the strategic level to the managers at the operational level.

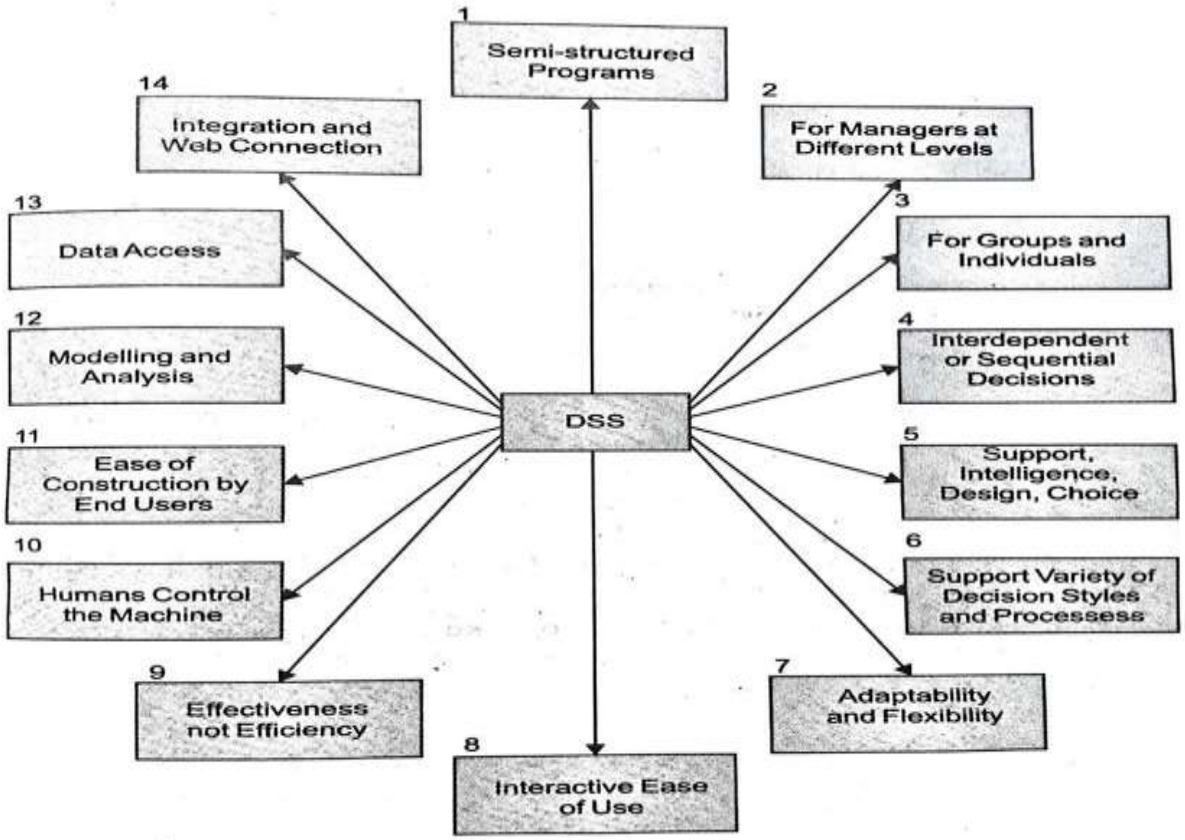


FIGURE -The ideal characteristics and capabilities of DSS

3. DSS provides support to individuals as well as to groups of managers. Less-structured problems often require the involvement of several individuals from different department and organizational levels or even from different organizations.

4. DSS provides support to several interdependent and/or sequential decisions. The decision may be made once, several times, or repeatedly.

5. DSS support all phases of the decision-making process: intelligence, design, choice, and, implementation.

6. DSS supports a variety of decision-making processes and styles.

7. DSS is adaptive over time. The decision-maker should be reactive, able to confront changing conditions quickly and be able to adapt the DSS to meet these changes. DSS is flexible, so users can add, delete, combine, change, or rearrange basic elements

8.. DSS should have the features like user-friendliness, strong graphical capabilities, and an English-like interactive human-machine interface. Such features can greatly increase the effectiveness of DSS.

9. DSS attempt to improve the effectiveness of decision-making (accuracy, timelines, quality) rather than its efficiency (the cost of making decisions).

10. The decision-maker has complete control over all steps of the decision-making process in solving a problem. A DSS specifically aims to support and not to replace the decision-maker.

11. End users should be able to construct and modify simple systems by themselves. Larger systems can be built with assistance from information system (IS) specialists.

12. A DSS usually utilizes models for analyzing decision-making situations. The modeling capability enables experimenting with different strategies under different configurations.

13. The DSS should provide access to a variety of data sources, formats, and types, ranging from geographic information systems (GIS) to object-oriented ones. A DSS can be employed as a standalone tool used by an individual decision-maker in one location, or it can be distributed throughout an organization and in several organizations along the supply chain.

14. It can be integrated with other DSS and/or applications, and it can be distributed internally and externally, using networking and Web technologies.

These characteristics allow decision-makers to make better, more consistent decisions in a timely manner, and they are provided by DSS major components.

8.5. INFORMATION, DECISION AND MANAGEMENT

The figure below emphasizes that the type of information required by decision-makers in a company is directly related to the level of management decision-making and the amount of

structure in the decision situations they face. It is important to understand that the framework of the classic managerial pyramid shown in Figure applies even in today's downsized organizations and flattened or non-hierarchical organizational structures. Levels of management decision-making still exist, but their size, shape and participants continue to change as today's fluid organizational structures evolve. Thus, the levels of managerial decision-making that must be supported by information technology in a successful organization are:

i. **Strategic Management**: Typically, a board of directors and an executive committee of the CEO and top executives develop overall organizational goals, strategies, policies, and objectives as part of a strategic planning process. They also monitor the strategic performance of the organization and its overall direction in the political, economic, and competitive business environment.
ii. **Tactical Management**: Increasingly, business professionals in self-directed teams as well as business unit managers develop short- and medium-range plans, schedules, and budgets and specify the policies, procedures, and business objectives for their subunits of the company. They also allocate resources and monitor the performance of their organizational subunits, including departments divisions, process teams, project teams, and other workgroups.
iii. **Operational Management**: The members of self-directed teams or operating managers develop short-range plans such as weekly production schedules. They direct the use of resources and the performance of tasks according to procedures and within budgets and schedules they establish for the teams and other workgroups of the organization.

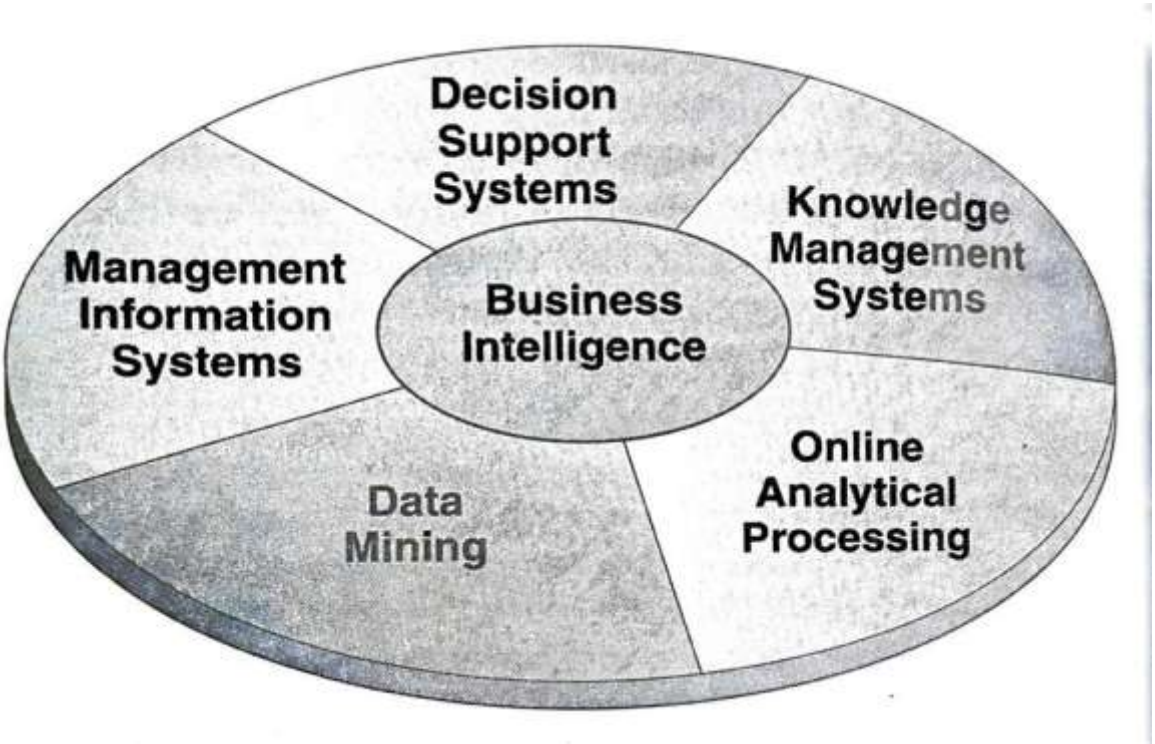
8.6. DECISION SUPPORT TRENDS

The emerging class of applications focuses on personalized decision support, modeling, information retrieval, data warehousing, what-if scenarios, and reporting.

Information systems has been used to support business decision, making it the primary thrusts of the business use of information technology. During the 1990s, however, academic researchers and business practitioners began to report that the traditional managerial focus originating from classic management information systems (1960s), decision support systems (1970s), and executive information systems (1980s) was expanding. The fast pace of new information technologies like PC hardware and software suites, client/server networks, and

networked PC versions of DSS software made decision support available to lower levels of management, as well as to nonmanagerial individuals self-directed teams of business professionals.

This trend has accelerated with the dramatic growth of the Internet, as well as of intranets and extranets that inter-network with companies and their stakeholders. The'-business and e-commerce initiatives that are being implemented by many companies are also expanding the information and decision Support uses and the expectations of a company's employees, managers, customers, suppliers, and other business partners. Figure. illustrates that all business stakeholders expect easy and instant access to information and Web-enabled self-service data analysis. Today's businesses are responding with a variety of personalized and proactive Web-based analytical techniques to support the decision-making requirements of all of their constituents.



Thus, the growth of corporate intranets and extranets, as well as the Web, has accelerated the development and use of "executive-class" information delivery and decision support software tools by lower levels of management and by individuals and teams of business professionals. In addition, this dramatic the expansion has opened the door to the use of such business intelligence (BI) tools by the suppliers, customers, and other business stakeholders of company for customer relationship management, supply chain management, and other - business applications.

In 1989, Howard Dresner (later a Gartner Group analyst) proposed BI as an umbrella term to describe "concepts and methods to improve business decision making by using fact-based support systems." It was not until the late 1990s that this usage became widespread. Today, BI is considered a necessary and mission-critical element in crafting and executing a firm's strategy. Consider the following findings from a 2009 Gartner Group study:

Because of a lack of information, processes, and tools, through 2012, more than 35 percent of the top 5,000 global companies will regularly fail to make insightful decisions about significant changes in their business and markets.

- By 2012, business units will control at least 40 percent of the total budget for business intelligence.
- By 2010, 20 percent of organizations will have an industry-specific analytic application, delivered via software as a service, as a standard component of their business intelligence portfolio.
- In 2009, collaborative decision-making will emerge as a new product category that combines social software with business intelligence platform capabilities.

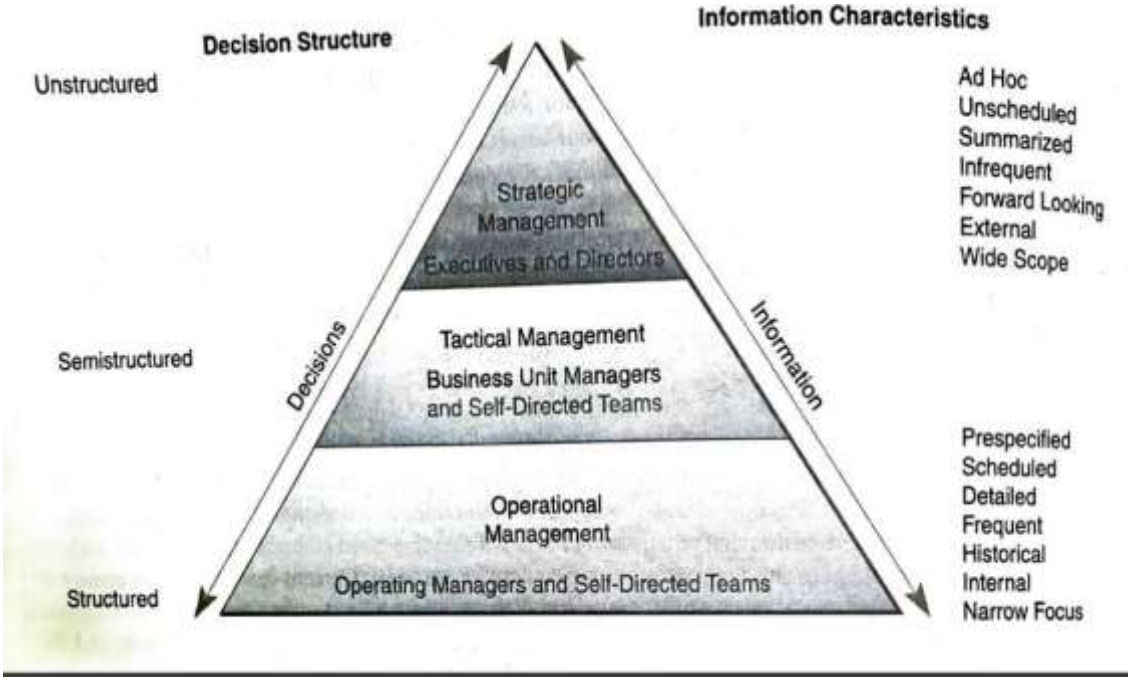
When you consider some of these findings, it becomes easy to see that BI is rapidly becoming the mainstay for business decision-making in modern organizations. Before long, it will evolve into; a competitive necessity for many industries.

As with all concepts in business-related technologies, business intelligence has evolved from Dresner's original definition focusing on concepts and methods to a more action-oriented approach referred to as business analytics. Business analytics (BA) refers to the skills, technologies, applications, and practices applied to a continuous iterative exploration and investigation of a business's historical performance to gain insight and drive the strategic business planning process. Business analytics focuses on developing new insights and understanding of business performance based on data and statistical methods. In contrast, business intelligence traditionally focuses on using a consistent set of metrics to both measure past performance and guide business planning, which is also based on data and statistical methods.

Business analytics makes much more extensive use of data, statistical and quantitative analysis, explanatory and predictive modeling, and fact-based management to drive decision-making. Analytics may be used as input for human decisions or may drive fully automated

decisions. Business intelligence is more associated with querying, reporting, online analytical processing (OLAP), and "alerts." In other words, querying, reporting, OLAP, and alert tools can answer the questions: *what happened; how many; how often; where; where exactly is the problem; and what actions are needed*. Business analytics, in contrast. can answer the questions*: why is this happening; what if these trends continue; what will happen next (that is, predict);* and *what is the best that can happen (that is, optimize).*

The figure below highlights several major information technologies that are being customized, personalized, and Web-enabled to provide key business information and analytical tools for managers, business professionals, and business stakeholders. We highlight the trends toward such business intelligence applications in the various types of information and decision support systems that are discussed in this chapter.



FIGURE

8.7. MANAGEMENT INFORMATION SYSTEMS

Management information systems were the original type of information system developed to support managerial decision-making. An MS produces information products that support many of the day-to-day decision-making needs of managers and business professionals. Reports, displays, and responses produced by management information systems provide information that these decision-makers have specified in advance as adequately meeting their

information needs. Such predefined information products satisfy the information needs of decision-makers at the operational and tactical levels of the organization who are faced with more structured types of decision situations.

For example, sales managers rely heavily on sales analysis reports to evaluate differences in performance among salespeople who sell the same types of products to the same types of customers. They have a pretty good idea of the kinds of information about sales results (by product line, sales territory, customer, salesperson, and so on) that they need to manage sales performance effectively. Managers and other decision-makers use an MIS to request information at their networked workstations that support their decision-making activities. This information takes the form of periodic, exception, and demand reports and immediate responses to inquiries. Web browsers, application programs, and database management software provide access to information in the intranet and other operational databases of the organization. Remember, operational databases are maintained by transaction processing systems. Data about the business environment are obtained from the Internet or extranet databases when necessary.

8.8. DECISION SUPPORT SYSTEM VERSUS MANAGEMENT INFORMATION SYSTEM

Is a DSS an MIS? How does a Decision Support System differ from a Management Information System? One can begin drawing distinctions between these two terms by first examining the concepts of Management Information System (MIS) and Information System (IS). Many authors have used the term "MIS" to describe a broad, general category of information systems. Also, MIS and IS are used interchangeably to describe a functional department in companies and organizations responsible for managing information systems and technology. A number of computing jobs are grouped together under the heading of MIS or IS professionals. Finally, the term "Management Information Systems" or "MIS" is used to identify an academic major and an area of scholarly inquiry in universities.

In the 1970s, an MIS generated periodic management reports. Today, managers use data-driven DSS to meet their management reporting needs. When the term "Management Information System" is defined narrowly, it refers to a management reporting system that provides periodic, structured, paper-based reports. In contrast, data-driven DSS are intended to be interactive, real-time systems that are responsive to unplanned, as well as planned,

information requests and reporting needs. Model-driven DSS are usually focused on modeling a specific decision or a set of related decisions (cf., Power, 1997).

DSS include a wide variety of analytical information systems. DSS provide managers more control of their data, access to analytical tools, and capabilities for consulting and interacting with a distributed group of staff. An enterprise wide DSS is linked to a large data warehouse and serves many managers within one company. Also, a DSS is defined as an interactive system in a networked environment that helps a targeted group of managers make decisions. The primary focus in the following discussion is on various types of DSS. The term MIS will be used sparingly and will usually refer broadly to an information system that provides managers with on-line access to information.

8.9. BUILDING DECISION SUPPORT SYSTEMS

Traditionally, IS academics and practitioners, have discussed building DSS in terms of four major components: 1) the user interface, 2) the database, 3) the models and analytical tools, and 4) the DSS architecture and network (cf., Sprague and Carlson, 1982). This traditional list of components remains useful because it identifies similarities and differences between categories or types of DSS, and it can help managers and analysts build new DSS. The expanded DSS framework is based on the different emphases placed on DSS components when a specific system is actually constructed.

Data-driven, document-driven and knowledge-driven DSS need specialized database components. A model-driven DSS may use a simple flat-file database with fewer than 1,000 records, but the model component is very important and it provides the functionality. Experience, and some empirical evidence, indicate that design and implementation issues vary for data-driven, document-driven, model-driven, and knowledge-driven DSS. Multiparticipant systems like group and inter-organizational DSS also create complex implementation issues. For instance, when implementing a data-driven DSS, a designer should be especially concerned about the user's interest in applying the DSS in unanticipated or novel situations.

In creating an accounting or financial simulation model, a developer should attempt to verify that the initial input estimates for the model are thoughtful and reasonable. In developing a representational or optimization model, an analyst should be concerned about possible

misunderstandings of what the model means and how it can or cannot be u2d (cf., Alter, 1980). Networking issues create challenges for many types of DSS, but especially for communications-driven systems with many participants, so-called multiparticipant systems. Today, architecture and networking issues are increasingly important in building DSS. DSS should be built or implemented using an appropriate process. Many small, specialized model-driven DSS are built quickly. Large, enterprise-wide DSS are built using sophisticated tools and systematic and structured systems analysis and development approaches. Communications-driven and GDS are usually purchased as "off-the-shelf" software and then implemented in a company. Creating enterprise-wide DSS environments remains an iterative and evolutionary task. As an enterprise-wide DSS grows, it inevitably becomes a major part of the overall information systems infrastructure of an organization. Despite the significant differences created by the specific task and scope of a DSS, all DSS have similar technical components and share a common purpose-_supporting decision making.

A data-driven DSS database is often a collection of current and historical structured data from a number of sources that have been organized for easy access and analysis. The above framework expands the database component to include unstructured documents in document-driven DSS and "knowledge" in the form of rules in knowledge-driven DSS. Large databases of structured data in enterprise-wide DSS are often called data warehouses or data marts. Data-driven DSS usually use data that has been extracted from all relevant internal and external databases. Managing information often means managing a database. Supporting management decision-making means that computerized tools are used to make sense of the structured data or documents in a database.

Mathematical and analytical models are the major component of a model-driven DSS. DSS models should be used and manipulated directly by managers-driven DSS. DSS models should be used and manipulated directly by managers and staff specialists. Each model-driven DSS has a specific set of purposes, and hence, different models are needed and used. Choosing appropriate models is a key design issue. Also, the software used for creating specific models needs to manage needed data and the user interface. In model-driven DSS the values of key variables or parameters are changed to reflect potential changes in supply, production, the economy, sales, the marketplace, costs, and/or other environmental and internal factors. Information from the models is then analyzed and evaluated by the decision-maker. Knowledge-driven DSS use special models, an inference engine, for processing rules or identifying relationships in data.

The communications component refers to how hardware is organized, how software and data are distributed in the system, and how components of the system are integrated and connected. A major issue today is whether DSS should be available, using a Web browser, on a company intranet and also available on the global Internet. Both managers and MIS staff need to develop an understanding of the technical issues and the security issues related to DSS architectures, networks, and the Internet. Networking and communications technology is the key driver of communications-driven DSS.

Managers and DSS analysts also need to emphasize the user interface component. In many ways, it is the most important component of any DSS. The tools for building the user interface are sometimes termed DSS generators, query and reporting tools, and front-end development packages. Much of the DSS design and development effort should focus on building the user interface. It is important to remember that the screens and displays in the user interface heavily influence how a manager perceives a DSS and whether it is used. What one sees is the DSS. (Power, 2002)

8.10. USING DECISION SUPPORT SYSTEM

A decision support system involves an interactive analytical modeling process. For example, using a DSS software package for decision support may result in a series of displays in response to the alternative.

What if changes are entered by a manager. This differs from the demand responses of a management information system because decision-makers are not demanding prespecified information; they are exploring possible alternatives; Thus, they do not have to specify their information needs in advance. Instead, they use the DSS to find the information they need to help them make a decision. This is the essence of the decision support system concept.

Four basic types of analytical modeling activities are involved in using decision support,

(1) what-if analysis, (2) sensitivity analysis, (3) goal-seeking analysis, and (4) optimization analysis briefly looks at each type of analytical modeling that can be used for decision support. See Figure below

Type of Analytical Modeling	Activities and Examples

What-if analysis	Observing how changes to selected variables affect other variables. Example: What if we cut advertising by 10 percent? What would happen to sales?
Sensitivity analysis	Observing how repeated changes to a single variable affect other variables. Example: Let's cut advertising by $100 repeatedly so we can see its relationship to sales.
Goal-seeking analysis	Making repeated changes to selected variables until a chosen variable reaches a target value. Example: Let's try increases in advertising until sales reach $1 million.
Optimization analysis	Finding an optimum value for selected variables, given certain constraints. Example: What's the best amount of advertising to have, given our budget and choice of media?

Activities and examples of the major types of analytical modeling.

8.10.1. What-If Analysis

In what-if analysis, a user makes changes to variables, or relationships among variables, and observes the resulting changes in the values of other variables. For example, if you were using a spreadsheet, you might change a revenue amount (a variable) or a tax rate formula (a relationship among variable) in, simple financial spreadsheet model. Then you could command the spreadsheet program to recalculate all affected variables in the spreadsheet instantly. A managerial user would be able to observe and evaluate any changes that occurred to the values in the spreadsheet, especially to a variable such as net profitable taxes. To many

managers, net profit after taxes is an example of the bottom line, that is, a key factor in making many types of decisions. This type of analysis would be repeated until the manager was satisfied with what the results revealed about the effects of various possible decisions.

8.10.2. Sensitivity Analysis

Sensitivity analysis is a special case of what-if analysis. Typically, the value of only one variable is changed repeatedly, and the resulting changes on other variables are observed. As such, sensitivity analysis really a case of what-if analysis that involves repeated changes to only one variable at a time. Some DSS packages automatically make repeated small changes to a variable when asked to perform sensitivity analysis. Typically, decision makers use sensitivity analysis when they are uncertain about the assumptions made in estimating the value of certain key variables. In our previous spreadsheet example, the value of revenue could be changed repeatedly in small increments, and the effects on other spreadsheet variables were observed and evaluated. This process would help a manager understand the impact of various revenue levels on other factors involved in decisions being considered. A typical example might be determining at what point the interest rate on a loan makes a project no longer feasible. By varying the interest rate used in a net present value calculation, for example, a manager can determine the range of acceptable interest rates under which a project can move forward. Approaching the problem this allows the manager to make decisions about a forthcoming project without knowing the actual cost of the money being borrowed.

8.10.3. Goal-Seeking Analysis

Goal-seeking analysis reverses the direction of the analysis done in what-if and sensitivity analyses. Instead of observing how changes in a variable affect other variables, goal-seeking analysis (also called bow-can analysis) sets a target value (eon) for a variable and then repeatedly changes other variables until the target value is achieved. For example, you could specify a target value (goal) of 2 million$ in net profit after taxes for a business venture. Then you could repeatedly, change the value of revenue or expenses in a Spreadsheet model until you achieved a result of $ 2 million. Thus, you could discover the amount of revenue or level of expenses the business venture needs to reach the goal of $2 million is after -tax profits.: Therefore, this form of analytical modeling Would kelp answer the question," How can we Achieve $2 million in net profit after taxes?" instead of the question," What happens if we change revenue or expenses?" So, goal-seeking analysis is another important method of decision support.

8.10.4. Optimization Analysis

Optimization analysis is a more complex extension of goal-seeking analysis. Instead of setting a specific target value for a variable, the goal is to find the optimum value for one or more target variables, given certain constraints. Then one or more other variables are changed repeatedly, subject to the specified constraints until you discover the best values for the target variables. For example, you could try to determine the highest possible level of profits that could be achieved by varying the values for selected revenue sources and expense categories. Changes to such variables could be subject to constraints, such as the limited capacity of a production process or limits to available financing. Optimization typically is accomplished using software like the Solver tool in Microsoft Excel and other software packages for optimization techniques such as linear programming.

8.11. DATA MINING FOR DECISION SUPPORT

We discussed data mining and data warehouses in Chapter S8 as vital tools for organizing and exploiting the data resources of a company. Thus, data mining's main purpose is to provide decision support to managers and business professionals through a process referred to as knowledge discovery. Data mining software analyzes the vast stores of historical business data that have been prepared for analysis in corporate data warehouses and tries to discover patterns, trends, and correlations hidden in the data that can help a company improve its business performance.

Data mining software may perform regression, decision tree, neural network, cluster detection, or market basket analysis for a business. See Figure . The data mining process can highlight buying patterns, reveal customer tendencies, cut redundant costs, or uncover unseen profitable relationships, and opportunities. For example, many companies use data mining to find more profitable ways to perform successful direct mailings, including e-mailings or discover better ways to display products in a store, design a better e-commerce Website, reach untapped profitable customers, or recognize customers or products that are unprofitable or marginal.

Market basket analysis (MBA) is one of the most common and useful types of data mining for marketing and is a key technique in business analytics. The purpose of market basket analysis is to determine which products customers purchase together with other products. MBA takes its name from the concept of customers throwing all of their purchases into a

shopping cart (a marker basket) during grocery shopping. It can be very helpful for a retailer or any other company to know which products people purchase as a group. A store could use this information to place products frequently sold together into the same area, and a catalogue or World Wide Web merchant could use it to determine the layouts of a catalogue and order form. Direct marketers could use the basket analysis results to determine which new products to offer their prior customers.

In some cases, the fact that items are sold together is obvious; every fast-food restaurant asks its customers "Would you like fries with that?" whenever a customer orders a sandwich. Sometimes, however, the fact that certain items would be sold together is far from obvious. A well-known example is the relationship between beer and diapers. A supermarket performing a basket analysis discovered that diapers and beer sell well together on Thursdays. Although the result makes some sense- couples stock upon supplies for themselves and for their children before the weekend starts-_it's far from intuitive. The strength of market basket analysis is as follows: By using computer data mining tools, it's not necessary for a person to think of which products consumers would logically buy together; instead, the customers' sales data speak for themselves. This is a good example of data-driven marketing. Consider some of the typical applications of MBA:

- **Cross-Selling.** Offer the associated items when a customer buys any items from your store.
- **Product Placement**. Items that are associated (such as bread and butter, tissues, and cold medicine, potato chips, and beer) can be put near each other. If the customers see them, it has a higher probability that they will purchase them together.
- **Affinity Promotion.** Design the promotional events based on associated products.
- **Survey Analysis.** The fact that both independent and dependent variables of market basket analysis are nominal (categorical) data types makes MBA very useful to analyze questionnaire data.
- **Fraud Detection.** Based on credit card usage data, we may be able to detect certain purchase behaviors that can be associated with the fraud.
- **Customer Behavior.** Associating purchases with demographic, and socio-economic data (such as age, gender, and preference) may produce very useful results for marketing.

Once it is known that customers who buy one product are likely to buy another, it is possible for a company to market the products together or make the purchasers of one product target prospects for another. If customers who purchase diapers are already likely to purchase beer, they'll be even more likely to buy beer if there happens to be a beer display just outside the diaper aisle. Likewise, if its known that customers who buy a sweater from a certain mail-order catalogue have a propensity towards buying a jacket from the same catalog, sales of jackets can be increased by having the telephone representatives describe and offer the jacket to anyone who calls in to order the sweater. By targeting customers who are already known to be likely buyers, the effectiveness of a given marketing effort is significantly increased-regardless of whether the marketing takes the form of in-store displays, catalog layout design, or direct offers to customers.

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UNIT 9: ISSUES AND CHALLENGES

Structure

9.1CHALLENGES

There are many challenges in managing information systems in organizations, which are important for a manager to understand.

Understanding the need and aligning business with MIS

The success of MIS depends significantly on understanding the need for an information system and aligning business with IS/IT. Generally, information systems are developed or acquired without understanding the specific needs of the organization for such systems. The goals of the information system and the reasons for implementing it, along with the sub-system or major tasks involved, are not clearly defined. Many a time IS/IT systems are conceived which may not be aligned with the mission and goals of the organization. As, a result the ISs may not be contributing any value to the organization.

9.1.1 Requirement Analysis

Many a time, the manager is not very clear about his/her requirements and thus it is left to the It specialist, who does not know much about the business. Thus, there remains a communication gap between the user and the IT specialist. As a result, the newly developed and implemented information system does not cater to the needs of the user.

9.1.2 Project Management

Information system to be successful must be developed/ implemented within time, budget and meet the quality standards. This calls for a proper IS project management. There may be many challenges in managing an IS/IT project, such as the following:

- Unrealistic Deadlines: Many IT projects are estimated using optimistic measures. Sometimes unrealistic deadlines are difficult to manage.
- Failure to Manage Risk: The project risks either are not well identified or are not managed fully leading to the failure of the project.
- Lack of Project Management Skills : The It project manager may be lacking the knowledge of project management tools and techniques. Instead of understanding It project as a socio-technical project, he/she focuses only on the technical aspects of the projects.
- Non-involvement of customers and end-users during the project: There is a big communication gap between the user and the technical professionals. The clients and end users are not involved during the project, which poses a great challenge to the success of the It project.

9.1.3 Re-engineering of business Process

Mere automation of the business process may not make the operation efficient and effective, rather it is redesigning of the business processes that is more important to improve the performance of the business. Re-engineering of the business processes would change the structure as well as the way an organization does business and thus leading to change in the organizational culture.

9.1.4 Change Management

Many IS/IT systems are considered as IT solutions and are not considered as a part of the business solution and hence there is no change management strategy in place.

Integrated Information systems like ERP Systems, being a transformation and an expensive solution, is not an easy decision, and thus needs to be dealt with care. While emphasising on the challenges of ERP system implementation, Kalakota and Robinson (2000) cautioned the organizations when they said that an ERP implementation is like the corporate equivalent of a brain transplant. The risk was certainly disruption of business, because if you do not do ERP properly, you can kill your company, guaranteed. They stressed this fact further and said that the fact cannot be denied that the implementation of ERP system is a complete business transformation which provides a competitive edge over other competitors but the costs and risks are also high. There have been different ERP implementation experiences from running into hundreds of millions of dollars.

9.2 ISSUES PERTAINING TO MIS

The ethical, social and managerial issues of the information systems are becoming more important these days because of the increased use of the internet and the interconnected information systems. These days, it has become much easier than ever before to gather, integrate and distribute information and thus has raised new concerns about the appropriate use of personal information relating to customers, employees or any other stake holder, protection of personal privacy; workplace monitoring and power struggle between employees and IS personnel; and the protection of the intellectual property. The other IS concerns relate to the deskilling of the employees; alienation or social cut off from the employees; setting of standards to protect system quality so as to protect the safety of the individual and the society; establishing accountability for the consequences of ISs; and preserving the values of the organization. In other words, while using information systems, these issues focus on the course of action that is secure, ethical and socially responsible.

9.2.1 Managerial Issues

- Organizational Impacts. Technology-supported communications are having various organizational impacts. The primary business benefit of networks and mobile communication is keeping workers connected. Mobile and collaboration technologies need to be in place to ensure that employees can be productive.

- Future of Technology Support. From a technology perspective the second half of this decade will be seen as a period in which technology moved to support collaboration. Whereas for the past five years the computer industry has been focused on providing computing for the individual, the emphasis is now firmly connectivity, communication, and collaboration.

- Virtual Work. Mobile multimedia technologies make it possible for businesses to reinvent the traditional workplace from an office-based activity to a virtual one. Employees can collaborate closely in real time with other employees, customers, or partners regardless of anyone's location.

- Extending organizational boundaries. Extranets connect businesses to their customers and supply chain partners. As high band-width networks become increasingly common, collaborative networking solutions are available for companies of any size.

- Single view of truth. Information silos are the bane of most of the organizations as they try to integrate and share data to get a clearer understanding of customers products, and other objects of interest. Regulatory compliance, performance management, and collaborative business relationships demand a single view of relevant information,

- Social and ethical issues. Social networks are redefining the way people communicate. Tools that are meant to improve the productivity and quality of life in general can also intrude on the personal lives of managers and employees.

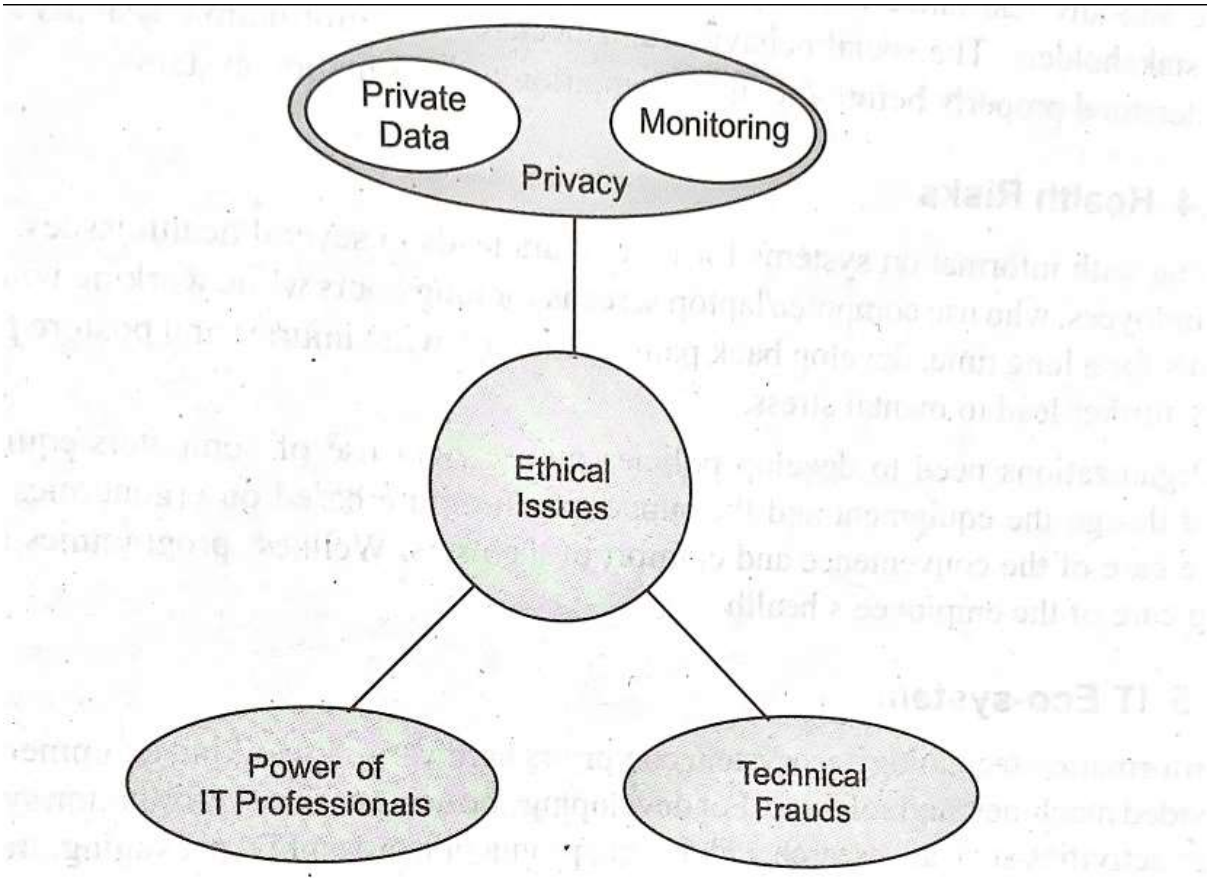

FIG.1 ETHICAL ISSUES OF INFORMATION SYSTEM

9.2.2 Ethical Issues

Ethics may be understood as the principles of right and wrong of the individuals or society choose to guide their behaviour. In other words, ethics may be referred as publicly accepted norms of behaviour for social engagement. Some proponents claim that ethics are the moral rules and codes that are agreed upon to be followed in the society. These moral norms or rules may be derived from a particular or a group of religion, and/or an ethos of community. Thus, the ethics may differ from one society to that of the other society. Ethics (the widely accepted norms of the society) should not be confused with the term legal. What is legal is determined by the law of the land, which is generally more explicit and written. Further, any legal issue is decided by the system of justice of the country. Whereas ethics are not that explicit and written down; they are loosely described rules of conduct and thus act as guidelines for the expected ethical behaviour. Though the ethical issues are not the creations of the information systems and are not of recent origin, they have been there since long. Nevertheless, information technology has heightened ethical concerns. The following ethical issues are of concern these days, which have been portrayed in Figure 1.

i. Private Data
ii. Workplace monitoring
iii. Power of IS professionals over other users.

9.2.2.1 Private Data

The information systems are gathering huge data that may pertain to the employees, customers, suppliers or any other stake-holder. This data may be very personal to these people and may be very sensitive that needs to be protected and thus handled very carefully. For example, the hospital information systems keep a record of the details of the diseases and the treatments of their patients; e-commerce sites capture personal details of a customer; e-governance sites such as income tax department, passport department, etc. capture personal details of its citizens. HR information systems collect a lot of personal details of its employees. The ethical issues regarding the private data are whether this data relates to the person or to the concerned organization and thus whether the organization can use private data related to a person for its decision-making/profit making. The answer to this relevant ethical issue varies from country to country.

It is important that the organizations as well as the concerned governments of the respective country should have clear policies/laws in place so that the personal data may not be misused.

9.2.2.2 Workplace Monitoring

Monitoring at the work place has been established method of controlling the performance and the behaviour of the employees. The employees are required to conform to certain work norms so as to achieve the pre-determined objectives. The management of an organization argues that the employees are required to have a close watch and supervision so as to ensure the desired behaviour from their employees that would in turn help achieve the targets of the organization. However, the other school of thought on the workplace monitoring opines that close supervision leads to loss of privacy and confidence of the employees.

The increased use of information systems has increased the scale and precision of monitoring of employees in the organization. For example, the BPO companies digitally record and save conversations of their employees to analyse whether the call was answered as per the prescribed norms. However, internet technology has posed new challenges for the workplace monitoring that has led to the loss of individual privacy. The complex nature of the information systems has made the question of ownership of data complicated, as the

information sent over these networked information systems may pass through many different computer systems before it reaches final destination, and each of these systems is capable of creating, monitoring and storing data. The following examples illustrate the privacy issue:

i. Some companies monitor employee emails and web surfing activities to minimize the wastage of their productive time during office time.
ii. The movement of the employees is captured from the security systems that use swipe cards for opening the office doors.
iii. The time spent by the employees may also be monitored from the log of the computer, where the work is computer intensive and they require logging in every time they want to work in the office.

Internet challenges to privacy

These days, many organizations are doing business using the internet-based information systems and thus many people including customers, suppliers, and the citizens use these information systems for their transactions. There are various tools that can monitor the visits of users to the websites. The websites can capture the identities of the visitors, once they register voluntarily at the site either to purchase a product or service or when they are offered free services/products. By using cookie technology, the websites can also capture data about the visitors without their knowledge or consent. Cookies are small files that are stored on a computer hard drive when a user surf the websites. These files identify the web browser of the user and track the visits to the website. For example, when a customer is surfing an e-commerce site wanting to purchase some item, the cookies would help to keep a track of what the user wants, help the user in making the payments and enable the user to move to other sites and return back to the website from where the user has made selection of some items. However, the users can either enable or disable the cookies in the browsers.

Cookies pose a great threat to the privacy of the users as the cookies help companies know the visitor's behaviour. Once the companies know the visits to a website by the user, it can target the advertisements at the visitor. Cookies data may also be combined with other data obtained from other sources such as websites where the user has registered or offline data collected from surveys, etc. to know the identity and develop a detailed profile of the visitors.

Similarly, spyware, which is a small file having some malicious software/ programme that is either installed secretly or get installed on the users' computer to invade the privacy of the user by monitoring the activity of the user on the computer. The spyware can also report the

sites without the knowledge of the users. A typical spyware may get itself installed through the email or through the web browser.

In view of these challenges, there is a need to formulate adequate policies for the organizations so that the users are aware of such a monitoring and also have proper rules/laws in case of the exploitation of the individual privacy of the people.

9.2.2.3 Power of IS professionals over other users

Information systems are developed and managed by the IS professionals with technical knowledge and the users, generally, do not have this technical knowledge. As a result, IS professionals, many a times use the power of technical knowledge over the other users in the organization. A person would be known to have power over the other person if he/she is able to influence the behaviour or thinking of the other person. It has been observed that IT professionals many a times influence the thinking or behaviour of the other users and make them to listen to and agree to what they say. Since the user, many a times is dependent on the IT technology, the IT professionals even go to the extent of dictating terms to the user and thus control their behaviour of using information systems. This is known as exercising the Power of IS professionals over other users. For example, the consultants who are appointed to implement ERP system in an organization, may not listen to the users for their genuine requirements for the customization of the system pretext on technical grounds. The exercise of power of IS Professionals over other users may be unintentional where both the parties are unaware of this exercise of this power. In the case when both the user and the IT professionals are aware of the power exercise situation, both the parties would negotiate to come to a solution. In still another situation, where the user is not aware of the power exercise, this would result into power manipulation by the IT professional. However, if the user is aware and the IS professional is not aware of such a situation, then it may lead to the resistance of the user. The ethical issues arise in situations where either party is unaware of the power exercise,

Organizations should sensitize all the users as well as the IT professionals in the organization so that no one feels that they are being dominated by the other party. Similarly, IT programmes and training programmes organized for such people need to sensitize the IT professional on this issue. Instead of giving technical reasons, they need to provide logic that why a particular process cannot be changed or has to be accepted by the users.

9.2.3 Social Issues

Information systems impact the individuals and the society in a number of ways. The negative socials costs of implementing information technologies have already started showing up. Information systems, despite many benefits, can damage our culture and society in a big way. Some of the negative social consequences of these information systems are discussed as below and shown in figure 2

i. De-skilling
ii. Alienation and loss of confidence
iii. Resistance to ISs
iv. Health risks
v. IT eco-system

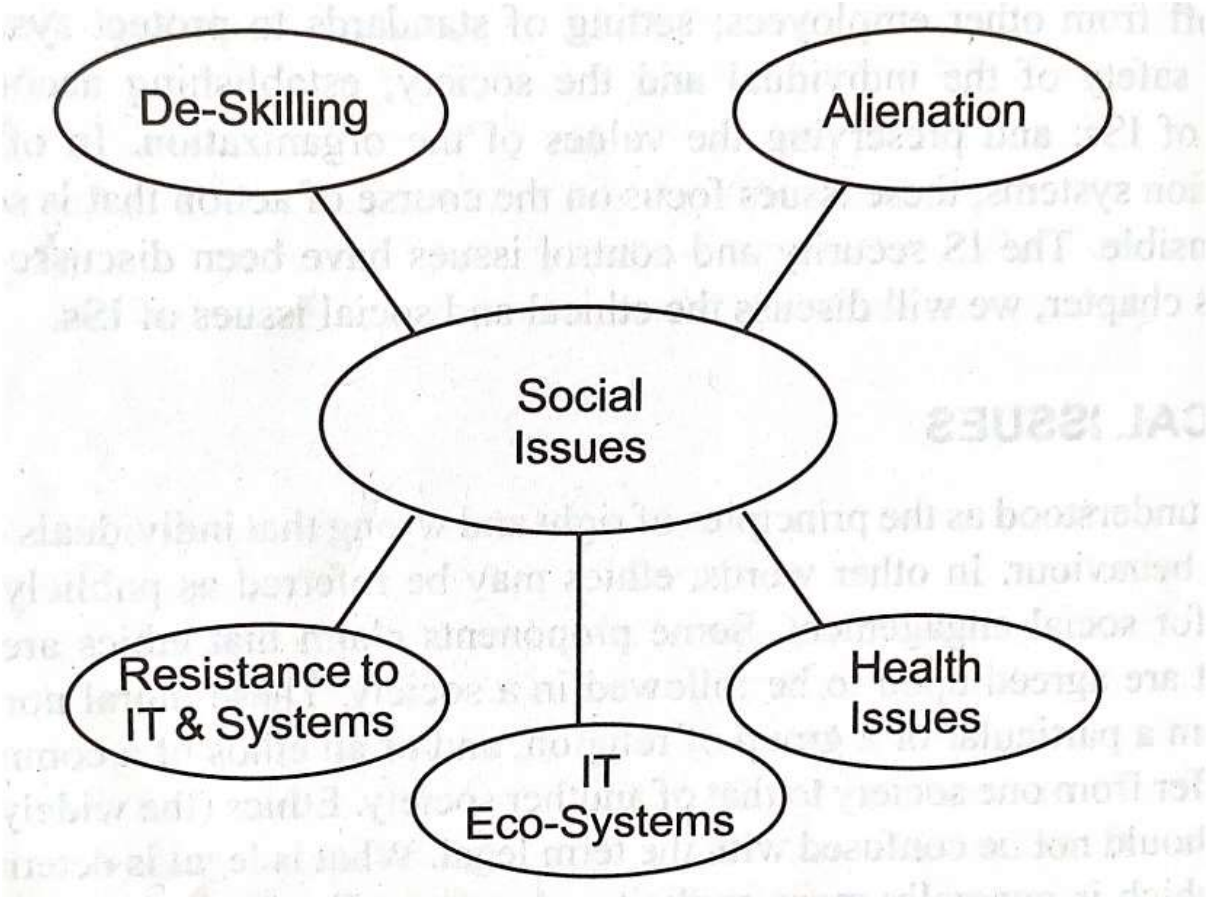

FIGURE 2. SOCIAL ISSUES OF INFORMATION SYSTEMS

9.2.3.1 De-skilling

With the new information system in place, the employees may be required to forget or unlearn some of the skills that were required to with the annual or old systems. This process of losing the skills because of the new systems is referred to as de-skilling. For example, with the dependency of children of the computer systems, their ability to calculate numbers is decreasing. Similarly, the employees who used to work with the manual systems were supposed to arrange the files region-wise, product-wise, year-wise and so on and read the labels of the files to locate the files quickly and were also required to remember the content of these files so as to get the right file. However, with the new computerized information system, employees do not need this skill as information system will take care of these aspects.

In order to develop the skills which are necessary for the overall development of the users, there should be more focus on improving the analytical and aptitude skills and thus more programmes need to be organized where the employees find challenges in solving problems requiring mental and logical abilities.

9.2.3.2 Alienation and loss of Confidence

As the people start doing more tasks using the information system and with the new information systems in place, they may not be doing tasks that require meetings and discussions with people. Slowly, their interaction with the colleagues would decrease. Even it may lead to spending of their lesser time with family members, friends, etc.

It results alienation among individuals and the lack of socialization may lead to loss of confidence among the individuals.

Organizations should develop more and more programmed/ organized social events also as to increase the interaction among the employees.

9.2.3.3 RESISTANCE TO ISs

Generally, it is found that whenever an organization wants to implement a new information system, it is resisted by the users. This resistance is not because of new technology; rather People resists this change because of other reasons that may include

- Fear of loss of job
- Fear of loss of athourity

- Changed social relations
- Fear of learning new technology

These reasons for the resistance to change may be reflected in the form of non cooperation in the implementation of new information system; denial to use the new information system; finding faults with the new systems; sabotaging of the system; damaging the system and even preventing others from using of the system.

Organizations should not forget that the biggest enable of an inormation system are the people and any resistance is going to the detrimental for the organization as well as for the other stake holders. The social/behavioural aspects of the information systems are required to be understood properly before the implementation of the information system.

9.2.3.4 Health risks

Working with information system for long hours leads to several health issues. For example, the employees, who use computer/ laptop screens for long hours while working with information systems for a long time, develop back pain, eye stain, wrist injuries and posture problems, etc. It may further lead to mental stress.

Organizations need to develop policies on the right use of computer/ equipment. They should design the equipment and the supporting furniture based on ergonomics design to take care of the convenience and comfort of the users. Wellness and rohranmes can also help taking care of the employee's health.

9.2.3.5 IT ECO-SYSTEM

The information technology ecosystem comprises hardware, networking equipment, computer embedded machines, and software. For developing and using of these information systems, many human activities such as research and design, production, assembly, packaging, transportation retailing, etc. are required to be exercuted.Similarly, the need users also engage in activities such as using, buying, and the eventual disposition of these IT components. All these activities create significant environmental problems and this are significantly affecting the natural ecosystem of this Planet. Due to the explosive growth in global demand for IT, it is increasingly consuming large amounts of energy and natural resources. Furthermore, in the field of IT, the rate of obsolescence is very high, and the

refresh cycle for IT equipment is relatively short. AT the same time, the users want to constantly update their equipment with newer, fancier ones, even though the older equipment is often still working. The disposal of all the un-needed electronic devices, which contain a lot of toxic substances, creates a huge problem due to the toxic chemicals contained in its hardware.

Organizations need to drastically reduce the amount of energy spent, for which they need to implement IT sustainability programmed. The manufacturing companies need to focus on developing efficient technology products. Keep e-waste out of landfills and adopt recycle and reuse programmes. Using more efficient technology can help consume fewer resources and emit less waste. Server virtualization has been found to be an effective strategy to bring technologically improved and energy efficiencies to computer hardware. A social movement is needed to encourage all organizations and individuals for judicious use of IT products. They need to be sensitized that any unnecessary use cause energy waste, and depletion of natural resources and energy emission of carbon-di-oxide. To achieve savings in electricity consumption, the utility companies should provide helpful tips on how to save energy in using computers, printers and lots of other electronics equipment for office and household use.

9.3 REFERENCES

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SEMESTER II

Course: Computer Applications in Accounting

UNIT 10: INTRODUCTION OF DATABASE MANAGEMENT

STRUCTURE

10.0 OBJECTIVES

After studying the Unit, students will be able to

- Know the fundamentals of database concepts.
- Understand and apply principles of storing the large amount of data.
- Understand and apply the various data base languages.
- Identify and analyze requirements for information systems.
- Identify the basic components of Data Base Management Systems.
- Conceptualize the difference between File oriented data base and data Base Management System.

10.1 Introduction

- **A database-management system** (DBMS) is a collection of interrelated data and a set of programs to access the data. This is a collection of related data with an implicit meaning and hence is a database.
- The collection of data, usually referred to as the **database,** contains information relevant to an enterprise.
- The primary goal of a DBMS is to provide a way to store and retrieve database information that is both *convenient* and *efficient.*
- 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 the people you know. You may have recorded this data in an indexed address book, or you may have stored it

on a diskette, using a personal computer and software such as DBASE IV or V, Microsoft ACCESS, or EXCEL.

- A **datum** - a unit of data - is a symbol or a set of symbols which is used to represent the raw facts and figures.
- This relationship between symbols and what they represent is the essence of what we mean by **information.** Hence, information is interpreted data - data supplied with semantics. Processed form of data is known as Information.
- **Knowledge** refers to the practical use of information.
- While information can be transported, stored or shared without many difficulties the same cannot be said about knowledge. Knowledge necessarily involves a personal experience.
- Referring back to the scientific experiment, a third person reading the results will have information about it, while the person who conducted the experiment personally will have knowledge about it.
- Database systems are designed to manage large bodies of information.
- Management of data involves both defining structures for storage of information and providing mechanisms for the manipulation of information.
- In addition, the database system must ensure the safety of the information stored, despite system crashes or attempts at unauthorized access. If data are to be shared among several users, the system must avoid possible anomalous results.
- Because information is so important in most organizations, computer scientists have developed a large body of concepts and techniques for managing data.
- These concepts and technique form the focus of this book. This chapter briefly introduces the principles of database system.

10.2 EVOLUTION OF DATA BASE SYSTEM

With the advent of civilization, advancement of living standards, the spread of education, sharing of knowledge and industrial revolution, the need of record keeping also evolved, which

included the areas of monetary and non monetary transaction. The records we kept in simple plain text or in some formatted manner.

We, in our daily routine life to maintain the record of one or more activities we may or may not putting it on papers. Since our memory is limited by its capacity we tend to put it on the papers, those records which are important shall be required for future referencing or for analysis or otherwise.

In the context of Data Base to put the records on the paper is storing of the data and calling the records in the future is called retrieving of the data.

Data Base: A Data Base is the collection of related information. So that it is available to many users for different purpose. In late 1950 some companies proposed the notation of generalized access to electronically stored data. Here, it becomes relevant to define this notion of generalized access. Generalized access means the method by which all sort of data may be read and manipulated. In 1960s the two basic models of data storage and retrieval evolved. First was the network data model developed by Conference in Data System Language Data Base Task Group (CODSYL DBTG) and the Hierarchical data model.

10.3 DATA PROCESSING VS. DATA MANAGEMENT SYSTEMS

- Data Processing and Data Management Systems both refer to functions that take raw data and transform it into usable information, the usage of the terms is very different.
- **Data Processing** is the term generally used to describe what was done by large mainframe computers from the late 1940's until the early 1980's (and which continues to be done in most large organizations to a greater or lesser extent even today): large volumes of raw transaction data fed into programs that update a master file, with fixed-format reports written to paper.
- **Data Management** Systems refers to an expansion of this concept, where the raw data, previously copied manually from paper to punched cards, and later into data-entry terminals, is now fed into the system from a variety of sources, including ATMs, EFT, and direct customer entry through the Internet.

- The master file concept has been largely displaced by database management systems, and static reporting replaced or augmented by ad-hoc reporting and direct inquiry, including downloading of data by customers.
- The ubiquity of the Internet *and* the *Personal Computer* have been the driving force in the transformation of Data Processing to the more global concept of Data Management systems.

10.4 CONCEPT OF DATA AND INFORMATION

DEFINITION

10.4.1 Data

Data means facts and figures which itself has no meaning but it helps to make the facts and figures meaningful. It can be anything like name of person, place or thing.

Example weight, cost, price tax code etc.

10.4.2 Information

The processed form of the data is called information. After processing of the data it produces some surprise value which is very useful for the receiver. After getting the information, one can make certain decision and may take certain action.

For the decision to be meaningful, the processed data must qualify the following characteristics like:

1. Timely: Information must be on time. Late information is of no use.
2. Accuracy: Information must be correct.
3. Complete: It should be complete. Incomplete information sometimes produce wrong signal.
4. Information must be given to the right person.

Data is converted into a more useful or intelligible form. It is the set of data that has been organized for direct utilization of mankind, as information helps the human beings in their

decision making process. Like Time Table, Merit list, Report card, Pay slips etc. The information is obtained by assembling items of data into a meaningful form.

Example of data and information

Marks obtained in different subjects in particular examination of a student acts as data. By processing this data, result may be obtained. The result is information. On the basis of the result student is declared pass or fail.

Hence, from the above it is clear that data and information are not same.

10.4.3 Need of Information

Modern civilization has become so complicated and sophisticated that to survive one has to be competitive, this compels the people to keep himself informed of all types of happenings in the society. Modern business management system has also rendered itself to bulk collection of data from various sources, that needs to rearranged in a fashion so that it can be utilised with minimum possible time. This needs a high amount of filing either at the data stage or at the information stage:

Information is needed

(1) To keep the system update.

(2) To gain the knowledge about the surroundings and whatever is happening in the society.

(3) To know about the rules and regulation.

(4) Based on the above three, we conclude that the information helps in planning current and prospective action in the process of forming, running and protecting a process or system.

10.4.4 Data Item (Field)

A set of characters which are used together to represent a specific data element *e*.g. Name of the student in a class is represented by the data item say NAME.

10.4.5 Record

Record is the collection of related data items.

10.4.6 File

File is the collection of various records. It is the basic unit (logical) storage in the computer system

Example:

Consider the SALARY file.

SALARY: **File**

Here **Data items are**

Sr. No., Name, Basic, DA, HRA, Total

Record

1. Mayanak 10,000 2500 100 12600

10.4.7 Data Aggregate

It is collection of data items within a record, which is given a name and is referred to as a whole.

Example date may be composed of the data items month, day and year.

10.4.8 Metadata

Meta data describes the properties or characteristics of other data. In simple terms it is data about data. It includes Entity name, Field names, their data type, size and etc.

10.5 FILE ORIENTED APPROACH

- The earliest business computer systems were used to process business records and produce information.
- They were generally faster and more accurate than equivalent manual systems. These systems stored groups of records in separate files, and so they were called **file processing systems.**
- In a typical file processing systems, each department has its own files, designed specifically for those applications.

- The department itself working with the data processing staff, sets policies or standards for the format and maintenance of its files.
- Programs are dependent on the files and vice-versa; that is, when the physical format of the file is changed, the program has also to be changed.
- Although the traditional file oriented approach to information processing is still widely used, it does have some very important disadvantages.

10.6 DATA BASE APPROACH

- In order to remove all limitations of the File Based Approach, a new approach was required that must be more effective known as Database approach.
- Database approach is a computer based storage technology in which related data is shared by various application programs.
- It is an improvement of traditionally file-based approach of storing data or information.
- It is characterized by a database management system and one or more databases.
- The database is a collection of related data stored in the database server, the data will be stored in the table.
- The main purpose of the database to provide a method for storing and retrieving data in a database quickly and efficiently.
- It is a single state stores data defined once and then access to multiple users.
- The main features of the database approach is that the database system contains not only data, but contains a complete definition or description of database structure and constraints.
- This definition is stored in the system directory, which contains information about the structure and definitions in the database.
- The information stored in a directory called meta-data that describes the database.
- Therefore, this approach will work on any database type, for example, the database security, airlines, banking data, financial data and company information database.
- A database system allows several users to access the database concurrently.

- Answering different questions from different users with the same (base) data is a central aspect of an information system.
- Data capturing and data storage is not redundant, the system can be operated from a central control and the data can be updated more efficiently.
- The database approach is that the database system does not only contain the data but also the complete definition and description of these data. These descriptions are basically details about the extent, the structure, the type and the format of all data and, additionally, the relationship between the data.
- This kind of stored data is called metadata ("data about data").
- Data integrity is a by word for the quality and the reliability of the data of a database system.
- In a broader sense data integrity includes also the protection of the database.
- Data reflect facts of the real world. Logically, it is demanded that this reflection is done correctly. A DBMS should support the task to bring only correct and consistent data into the database.
- Additionally, correct transactions ensure that the consistency is maintained during the operation of the system.
- In a DBMS all data is maintained as long as it is not deleted explicitly.
- The life span of data needs to be determined directly or indirectly be the user.

10.7 CHARACTERISTICS OF DATABASE APPROACH

1. **Increase data share ability:** Large organizations, such as insurance companies, banks, local councils and manufacturing companies, have for some time been putting large amounts of data onto their computer systems. Frequently, the same data was being collected, validated, stored and accessed separately for a number of purposes. For example, there could be a file of customer details for sales order processing and another for sales ledger. This 'data redundancy' is costly and can be avoided by following a database approach. In fact some data duplication is reasonable in a database environment, but it should be known, controlled and be there for a purpose, such as

efficient response to some database queries. However, the underlying data should be collected only once, and verified only once, so that there is little chance of inconsistency. With conventional files, the data is often collected at different times and validated by different validation routines, and therefore the output produced by different systems could well be inconsistent. In such situations the data resource is not easily managed and this leads to a number of problems. With reduced redundancy, data can be managed and shared, but it is essential that good integrity and security features operate in such systems. In other words, there needs to be control of the data resource. Furthermore, each application should run 'unaware' of the existence of others using the database. Good share ability implies a ready availability of the data to all users. The computer system must therefore be powerful enough so that performance is good even when there are a large number of users concurrently accessing the database.

2. **Increase data integrity:** In a shared environment, it is crucial for the success of the database users accessing the database, there must be some control to prevent failed transactions leaving the database in an inconsistent state. However, this should be easier to effect in a database environment, because of the possibilities of central management of the data resource, than in an environment where each application sets up its own files. Standards need only be agreed and implemented once for all users.
3. **Increase speed of implementing applications:** Applications ought to be implemented in less time, since systems development staff can largely concentrate on the processes involved in the application itself rather than on the collection, validation, sorting and storage of data. Much of the data required for a new application may already be held on the database, put there for another purpose. Accessing the data will also be easier because the data manipulation features of the database management system will handle this.
4. **Ease data access by programmers and users:** Early database management systems used well-known programming languages such as Cobol to access the database. Cobol, for example, was extended to include new instructions, which were used when it was necessary to access data on the database. However we now have specific database query languages, such as SQL, and other software tools that ease the process of applications

development in a database environment. Once the database had been set up, applications development time should be greatly reduced.

5. **Increase data independence:** There are many aspects to data independence. It is the ability to change the format of the data, the medium on which the data is held or the data structures, without having to change the programs that use the data. Conversely, it also means that it is possible to change the logic of the programs without having to change the file definitions, so that programmer productivity is increased. It also means that there can be different user views of the data even though it is stored only once. This separation of the issues concerning processes from the issues concerning data is a key reason for opting for the database solution. It provides far greater flexibility when compared to conventional file-based applications.
6. **Improve standards:** Applications tend to be implemented by different project teams of systems analysts and programmers and it has been difficult to apply standards and conventions for all applications. Computer people are reputed to dislike adopting the norms of the firm, and it is difficult to impose standards where applications are developed piecemeal. With a central database, it is possible to impose standards for file creation, access and update, and to impose good controls, enabling unauthorized access to be restricted and providing adequate back-up and security features.

10.8 DEFINITION OF DATA BASE MANAGEMENT SYSTEM

Data Base: It is the collection of occurrence of multiple, but related files, containing the relationship among the records, data aggregates and data items.

Management : Management means planning, organizing and controlling.

(*i*) **Planning** Means the task to be performed.

(*ii*) **Organizing** Means tackling the available resources.

(*iii*) **Controlling** To control the working of all the components of the system.

In context of Data Base Management we mean management of the data base which includes the services like data description, data manipulation and data control. In short we abbreviate it as

DDL : Data Definition Language

DML : Data Manipulation Language

DCL : Data Control Language

System : System means organized relationship among the different components of the data base.

"System is an orderly grouping of interdependent components linked together according to a plan to achieve a specific goal."

Combining Data base Management system, is combination of all the above components and we derive the one definition of DBMS as data base management system is a software system which is used for defining, constructing and controlling the data base.

By defining a data base it involves specifying the type, its structure and the constraints for the data to be stored in the data base.

By constructing we mean storing the data on some storage medium that is controlled by DBMS.

By controlling the data base means defining authorization for user and defining their access to the right person.

10.9 NEED FOR DATA BASE MANAGEMENT SYSTEM

Historically, information system involved the development of standalone systems for separate application with their own set of file. This means that data such as addresses may be duplicated in many separate systems such as employee's address once in the payroll system and again in personal file. This causes wastage of space and inconsistency. There may be possibility for the address to be updated in one system but not in the other and hence making the data inconsistent.

To cope up with the above problem, development of data base approach evolved. In the data base approach, an organization attempts to build an integrated data base to support all the data requirement of the organization. A DBMS is like a suitcase where all the stuff (data) is put so that it is available at one place and easy to access.

10.10 CHARACTERISTICS OF DBMS

The following are the characteristics of DBMS :

1. **Minimal Redundancy:** Redundancy means duplicacy. In file system each application has its own private file. This will result duplicacy and there is a wastage of space. For example a personal application and an educational records application may each have its own file containing department information for employees. These two files can be integrated and the redundancy can be eliminated if the DBA is aware of data requirement for both applications.
2. **Sharing of Data:** Sharing of data allows the existing application to use the stored data base. It also helps in developing the new application, which will use the same stored data. Due to shared data, it is possible to satisfy the data requirement of new application without having to create new data. For example in banking the account holder's name and address can be shared by all the departments. As a result, any change in the current account policies can be implemented virtually with no change in the table structure.
3. **Inconsistency can be Avoided:** This is the result of the minimum redundancy. If there is no duplicacy or minimum duplicacy it will automatically lead to consistency or inconsistency can be avoided.

   Suppose that an employee E7 works in department D3 is represented by two different entries in the data base and that in system is not aware of this duplicacy. Then there will be some occasion on which the two entries will not agree. At that time data base is said to be inconsistent obviously that data base is in inconsistent state or conflicting the information.
4. **Standard can be Enforced :** With the central control of the data base, the DBA can ensure that all the applicable standards are followed in representation of the data such as format of data items, convention on data name, documentation standard etc. which will result in uniformity of the data base as well as its usage.
5. **Improvement in Data Security:** In the data base system data must be secured and private. Data security refers to the protection of data against accidental or intentional

discloser to the unauthorized user. Security is highly complex subject because there are so many different aspects to it. The following are essential for data security:

(*i*) Data should be reconstruct able.

(*ii*) Data should be auditable.

(*iii*) System must be able to check user's actions whether they are authorized or unauthorized.

(*iv*) Users action should be monitored minutely.

(*v*) Data should be protected from theft, fire or other form of destruction. With the help of DBMS the Data Security can be prevailed.

6. **Better Interaction with the User:** DBMS often provides better interaction to the user. In conventional system, usually the information is poorly arranged and as a result the availability of data is very poor.

   However in case of DBMS, the availability of up to date information improves the interaction and the data can now be shared. DBMS makes it easy to respond to unforeseen information request. Centralizing the data in a data base also means that user can obtain new and combined information that would have been impossible to obtain otherwise. In addition, use of DBMS allows the users, who do not know programming, to interact with the data more easily.

7. **Efficient System:** It is very common to change the contents of stored data. These changes can easily be made in DBMS than in a conventional system as these changes do not need to have any efficiency impact on application program. It will also increase the efficiency of the system.

8. **Faster Development of New Application:** When a new application is proposed, it is likely that the data required is already stored in the data base. Therefore, development time is reduced as no file creation phase is required for new application.

9. **Data Migration:** With the help of DBMS tool one can transfer the data from one to the other table very easily. The rarely accessed data can be stored in a cheaper fashion.

10. **Tunability:** Adjusting a data base to improve its performance is referred to as tunability. The DBA is responsible for the tuning and the operation of data base. Effective Tuning has two requirements:
    (*i*) Physical data base independence is necessary.
    (*ii*) Automatically monitoring of the usage of data base so that appropriate adjustment can be made.

10.11 TRADITIONAL FILE PROCESSING ENVIRONMENT

The earlier business computer system were used to process the business records and produce the information. They were generally faster and more accurate than equivalent manual system. These systems store group of records in a separate file so they are called file processing systems. In a typical processing system, department has its own files designed specifically for those application.

Programs are dependent on files and vice-versa i.e. when the physical format of the file is changed, the program has also to be changed. Although the traditional file-oriented approach to information processing is still widely used, it does have some disadvantages.

10.12 LIMITATIONS/DISADVANTAGES OF TRADITIONAL FILE PROCESSING SYSTEM

The disadvantages of the Traditional file system are:

1. **Duplicate data:** Since all the files are independent of each other. Some files are stored in more than one file.
2. **Inconsistency:** In file processing system, data is not consistent. If a data item is to be changed then all the files containing that data need to be updated. The problem arises that all the files might not be updated causing inconsistency.
3. **Poor Data Integrity:** A collection of data has integrity, if data is logically consistent that is the duplicate data item agree with one another. In a file processing system, poor data integrity often develops.

4. **Data is Isolated and separated :** If it is needed to extract data from two different files, it will be required to determine which parts of each of the files are needed, then question arises how the files are related to one another ?
5. **Poor Data Security:** Data is stored in different files causing the security problem.
6. **Difficult to represent complex object:** Some data object may be of variable length which produce difficulty in representation of files.
7. **Incompatible File Forma :** Each programmer stores the data in the file in the format as per the choice as there is no standard file format for storing the file. It becomes very difficult to handle the different file in different format.
8. **Data Dependency:** Data dependence means it is impossible to change storage structure without affecting the application program.
9. **Lack of Flexibility :** In traditional file system, programmes are already told about which type of queries need to be answered by the application, and programme code that query using the data files for that application only.

10.13 COMPONENTS OF DATA BASE

There are four components of data base

1. Data
2. Hardware
3. Software
4. User

1. **Data:** Data stored in the system is partitioned into one or more data base. A data base 0both integrated and shared. By 'integrated' we mean that the data base may be thought of as a unification of several data files. By 'shared' we mean that individual piece of data may be shared among several different users.
2. **Hardware:** The hardware consists of secondary storage volumes disks, drums etc. on which the data base resides together with the associated devices, control with channel and so forth.
3. **Software:** Between the hardware and user there is a layer of software usually called as data base management system ''DBMS''. All the request from the user is handled by the DBMS.

4. **Data Base User:** There are three classes of user.

   (*i*) **Application Programmer:** They are responsible for writing the application programs that uses the data base. In typical data base we use the language COBOL or PL/I to meet the requirement.

   (*ii*) **End User:** These type of the users access the data base from the terminal. There are two types of end user.

   1. Casual user 2. Naive user.

   (*iii*) **Data Base Administrator (DBA):** DBA is a person or group of persons responsible for the overall control of the data base. The Database Administrator requires both Technical and Managerial knowledge.

10.14 DATA BASE ENVIRONMENT

In contrast to the file environment, the integrated data base environment has a single large repository of data called the data base, which is used simultaneously by many users. All the files are shared by the different users. It is managed by an individual (or groups) called the data base administrator (DBA), who is responsible for designing, creating and maintaining the data base to satisfy the need of users. All access to the data base is controlled by a sophisticated software package called data base management system (DBMS).

- Database system refers to a set of components that define and control the collection, storage, management and use of data.
- It is composed of five major parts hardware, software, people, procedures and data.

1. Hardware: Hardware refers to all of the system's physical devices; for example, computers storage devices, printers, network devices and etc.

2. Software: To make the database system work properly, three types of software are needed: operating system, DBMS software, and application programs.

(*a*) Operating system: It manages all hardware components and allows other software to run on the computers. Examples of operating system software include Windows, Linux and etc.

(*b*) DBMS Software: It manages the database within the database system. Some examples of DBMS software include Oracle, Access, MySql and etc.

(*c*) Application Programmer: These are used to access and manipulate data in the DBMS and to manage the computer environment in which data access and manipulation take place. Application programs are most commonly used to access data to generate reports. Most of the application programs provide GUI.

3. People: This component includes all users of the database system. According to the job nature, five types of users can be identified: systems administrators, database administrators, database designers, systems analysts and programmers, and end users.

10.14.1. Users of Database Environment

According to the job nature, there are five types of users that can be identifie :

(*a*) System administrator: They supervise the database system's general operations.

(*b*) Database administrator: They are also known as DBAs. They manage the DBMS and ensure that the database is functioning properly.

(*c*) Database designers: They design the database structure. They are the database architects. As this is very critical, the designer's job responsibilities are increased.

(*d*) Systems analysts and programmers: They design and implement the application programs. They design and create the data entry screens, reports, and procedures through which end users can access and manipulate the data.

(*e*) End users: They are the people who use the application programs to run the organization's daily operations. For example, sales-clerks, supervisors, managers are classified as end users.

4. Procedures: Procedures are the instructions and rules that supervise the design and use of the database system. Procedures are a critical component of the system. Procedures play an important role in a company because they enforce the standards by which business is conducted in an organization

5. Data: Data refers the collection of facts stored in the database.

10.15 ADVANTAGES OF USING THE DBMS APPROACH

1. **Controlled Redundancy**
   - In the file processing approach, each user defines and implements the files needed and software applications to manipulate those files.
   - Various files are likely to have different formats and programs may be written in different languages and same information may be duplicated in several files.
   - Data redundancy leads to
     - Wasted storage space
     - Duplication of effort (when multiple copies of a datum need to be updated),
     - Higher likelihood of the introduction of inconsistency.
   - Database design stores each logical data item at one place to ensure consistency and saves storage.
   - But sometimes, controlled redundancy is necessary to improve the performance.
   - Database should have capability to control this redundancy & maintain consistency by specifying the checks during database design.
2. **Multiple user interfaces**
   - DBMS provides a variety of user interfaces for the users of varying level of technical knowledge.
   - These includes query language for casual users, programming language interfaces for application programmers, forms and command codes for parametric users, menu driven interfaces and natural language interfaces for stand alone users etc
3. **Providing Backup & Recovery**
   - Data should be restored to a consistent state at the time system crash and changes being made
   - If hardware or software fails in the middle of the update program, the recovery subsystem of DBMS ensures that update program is resumed at the point of failure.
4. **Restricting Unauthorized Access**
   - A DBMS provides a security and authorization subsystem, which is used by DBA to create user accounts and to specify restrictions on user accounts.

- File processing system provides password mechanism and very less security which is not sufficient to enforce security policies like DBMS.

5. **Providing Persistent Storage for Program Objects**
   - Object oriented database systems are compatible with programming languages such as C++ and Java.
   - A DBMS software automatically performs the conversion of a complex object which can be stored in object oriented DBMS, such an object is said to be persistent due to its survival after the termination of the program.
6. **Providing Storage Structures for Efficient Query Processing**
   - The DBMS utilizes a variety of sophisticated techniques (view, indexes etc.) to store and retrieve the data efficiently that are utilized to improve the execution time of queries and updates.
   - DBMS provides indexes and buffering for fast access of query result, the choice of index is part of physical database design and tuning.
   - The query processing and optimization module is responsible for choosing an efficient query execution plan for each query submitted to the system.
7. **Representing Complex Relationships among data**
   - A DBMS must have the capability to represent a variety of complex relationship among the data, to define new relationships as they arise, and to retrieve and update the related data easily and efficiently.
8. **Enforcing Integrity Constraints**
   - The DBMS have certain integrity constraints that hold on data.
   - These constraints are derived from the meaning of the data and of the miniworld.
   - Some constraints can be specified to the DBMS at the time of defining data definitions and automatically enforced.
   - Database does not allow violation of constraints at the time of updating the database.
9. **Permitting Inference and Action Using Rules**
   - Deductive database systems provide capabilities for defining deduction rules for inference new information from the stored database facts.

- Triggers can be associated with tables.
- A trigger is a form of a rule activated by updates to the table, which results in performing some additional operations to some other tables, sending messages and so on.
- Stored procedure can also be used as a part of the overall database definition and are invoked appropriately when certain conditions are met.
- Active database provides more powerful functionality by providing the active rules that can automatically initiate actions when certain events and conditions occur.

10.16 CLASSIFICATION OF DBMS

The DBMSs can be classified into different categories on the basis of several criteria such

- Based on data model
- Based on number of users
- Based on number of sites
- Based on purpose

1. **Based on Data Model :**
   - The various data models used in the DBMSs can be classified as Hierarchical, network, relational, object-oriented, and object-relational.
   - Among these, the hierarchical and network data models are the older data models and now known as legacy data models.
   - Some of the old applications still run on the database systems based on these models.
   - Most of the popular and current commercial DBMSs are based on relational data model.
   - The object-based data models have been implemented in some DBMSs; however, have not become popular.
   - Due to the popularity of relational databases, the object-oriented concepts have been introduced in these databases that led to the development of a new class of DBMSs called object-relational DBMSs.

2. **Based on Number of Users :**
    - Depending on the number of users the DBMS supports, it is divided into two categories, namely, single-user system and multi-user system.
    - In **single-user system** the database resides on one computer and is only accessed by one user at a time.
    - The user may design, maintain, and write programs for accessing and manipulating the database according to the requirements, as well as perform all the user roles.
    - The user may also hire database system designers to design a system.
    - In such a case, the single user performs the role of end user only.
    - However, in most enterprises the large amount of data is to be managed and accessed by multiple users and thus, requires **multi-user systems**.
    - In multi-user system, multiple users can access the database simultaneously.
    - In multi-user DBMS, the data is both integrated and shared.
    - For example, the Online Book database is a multi-user database system in which the data of books, authors, and publishers are stored centrally and can be accessed by many users.

3. **Based on Number of Sites:**
    - Depending on the number of sites over which the database is distributed.
    - It is divided into two types, namely, centralized and distributed database systems.
    - Centralized database systems run on a single computer system.
    - Both the database and DBMS software reside at a single computer site.
    - The user interacts with the centralized system through a dummy terminal connected to it for information retrieval.
    - In distributed database systems, the database and DBMS are distributed over several computers located at different sites.
    - The computers communicate with each other through various communication media such as high-speed networks or telephone lines.
    - Distributed databases can be classified as homogeneous and heterogeneous.

- In homogeneous distributed database system, all sites have identical database management system software, whereas in heterogeneous distributed database system, different sites use different database management system software.

4. **Based on the Purpose:**
   - Depending on the purpose the DBMS serves, it can be classified as **general purpose** or **specific purpose**.
   - DBMS is a general purpose software system. It can; however, be designed for specific purposes such as airline or railway reservation.
   - Such systems cannot be used for other applications without major changes.
   - These database systems fall under the category of online transaction processing (OLTP) systems.
   - Online transaction processing system is specifically used for data entry and retrieval.
   - It supports large number of concurrent transactions without excessive delays.
   - An automatic teller machine (ATM) for a bank is an example of online commercial transaction processing application.
   - The OLTP technology is used in various industries, such as banking, airlines, supermarkets, manufacturing, etc.

10.17 Data Base Languages

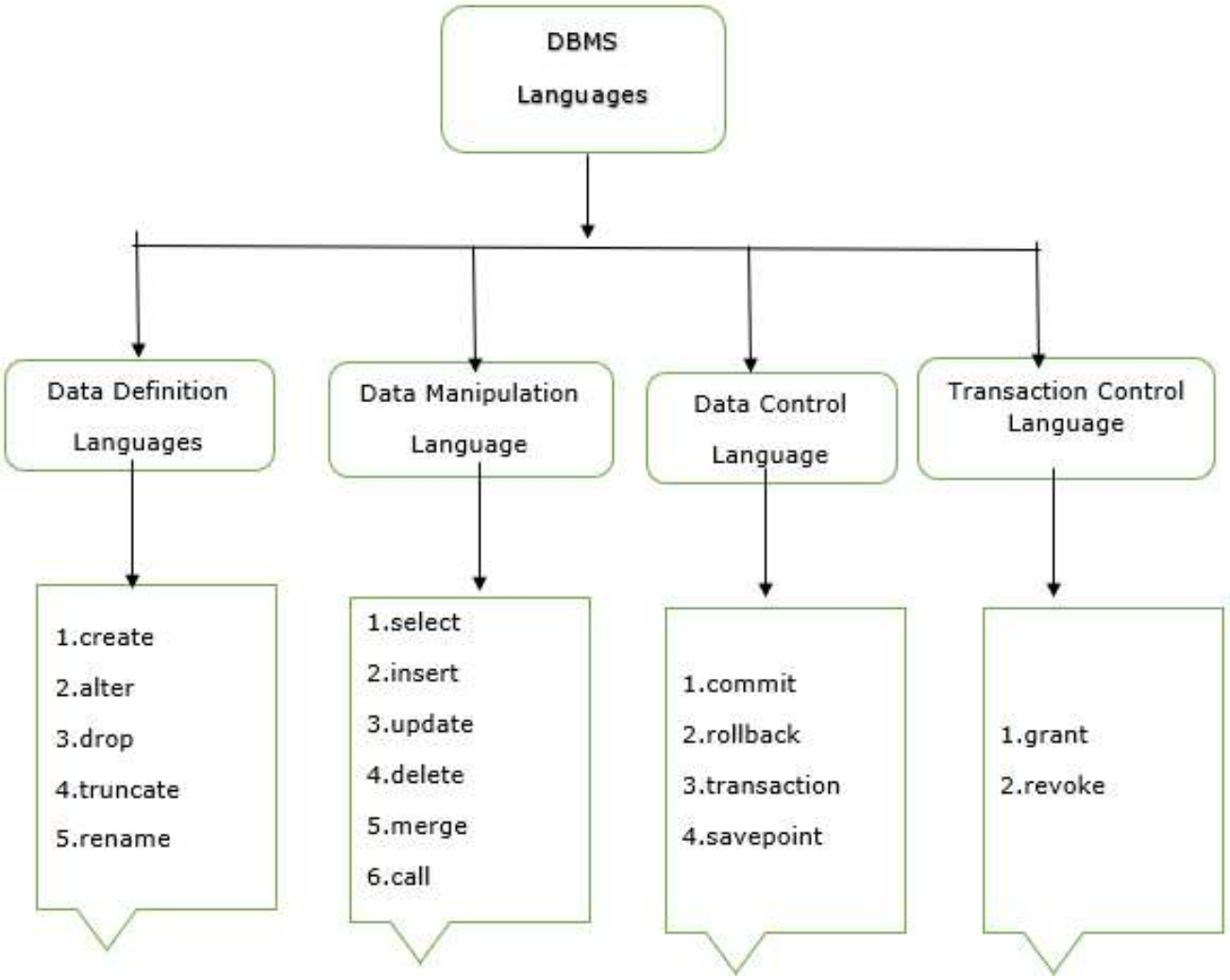
Once data is stored or filled it requires manipulation like insertion, deletion, updating, and modification of data. For these operations a set of languages are provided by the database management system (DBMS). So, the database languages are used to read, update and store data in the database.

The different types of DBMS languages are as follows −

- Data Definition Language (DDL) − Create, Drop, Truncate, Rename.
- Data Manipulation language (DML) − Select, Insert, Delete, Update.

- Data Control Language (DCL) − Revoke, Grant.
- Transaction Control Language (TCL) − Rollback, Commit.

The DBMS languages are pictorially represented as follows:



1. **Data Definition Language (DDL)**

It is a language that allows the user to define the data and their relationship to other types of data. The DDL commands are: Create, Alter, Rename, Drop, Truncate.

2. **Data Manipulation Language (DML)**

It is a language that provides a set of operations to support the basic data manipulation operation on data held in the database. The DML commands are: Insert, delete, update, select, merge, call.

3. Data Control Language (DCL)

DCL is used to access the stored data. It is mainly used for revoke and grant the user access to a database. The DCL commands are: Grant, Revoke.

4. Transaction Control Language (TCL)

TCL is a language which manages the transactions within the database. It is used to execute the changes made by the data manipulation language statements. The TCL commands are: Commit, Rollback.

10.18 DATA BASE ADMINISTRATION AND ITS RESPONSIBILITY

DBA is a person or group of persons responsible for overall control of the data base system. All the activities in data base system are controlled by DBA. The DBA must be expert in information technology and has a good skill of management. He acts as a mediator between the management and computer professional. A DBA must be well equipped with the knowledge of new development. The overall goal of DBA is to maintain the data base system and to provide the user with access to the required information when they need it. The DBA makes sure that the data base is protected and any chance of data loss is minimized. The responsibilities of data base administrator are listed below:

(*i*) **Deciding the information contents of database:** It is the DBA who decides the information contents of data base. DBA decides fields, type of fields, its range of values that can be stored in the fields.

(*ii*) **Deciding the user and data to be used by the user:** It is the DBA who decides the users of the data base system. DBA also decides which information contents are to be used by any particular user.

(*iii*) **Deciding the Hardware device to be used:** It is the job of DBA to decide which hardware device will be suitable for current data base application.

(*iv*) **Deciding the backup and Recovery Method:** To avoid the accidental loss of data backup of the data is maintained on regular interval. It is the DBA who decides which data is to be backed up and when. If data is lost then it is the duty of DBA how to recover the data from the existing data backup.

(*v*) Ensuring that the data base is updated regularly and accurately.

(*vi*) Identifying and resolving user's problem.

(*vii*) Procuring and maintaining data base software and related documents and tools.

(*viii*) Facilitating sharing of common data by proper key management and data dictionary maintenance.

(*ix*) Deciding the validation checks on the data.

(*x*) Monitoring performance and responding to the changing requirement. The DBA is responsible for so organizing the system as to get the performance that is ''the best for the enterprise'' and for making the appropriate adjustments as requirement changes.

(*xi*) **Access Strategy:** It is the duty of DBA to decide the method of accessing the data. DBA also provides the permission who can access the data base and revoke the data base.

10.19 DISADVANTAGES OF DBMS

1. **Complexity:** To develop the software that is expected to be a good DBMS makes the DBMS extremely complex. Database Designer, Developers, Data Base, Administrator and user must understand this functionality to take full advantage of it. Failure to understand the system can lead to bad database design decisions which can have a serious result for an organization.
2. **Cost of DBMS:** The cost of DBMS changes significantly, depending on the environment and functionality provided. There is also recurrent annual manual cost.
3. **Cost of Conversion:** The cost of the DBMS and extra hardware may be in significant and compared with the cost of converting existing application to run on new DBMS and hardware. It also includes the cost of training staff to use these new systems and possibility. The employment of the specialist staff to help with the conversion and running of system.

4. **Higher Impact of Failure:** The centralization of resources increases the chances of failure. Since all the user and application rely on the availability of DBMS, in failure of any component will lead halt of operations.
5. **Size:** The functionality of DBMS makes the DBMS extremely large pieces of software, occupying many megabytes of disk space and requires subsantial amount of memory to run efficiently.
6. **Performance:** Typically, file based system is written for the specific application. As a result the performance is generally very good. However, the DBMS is written to be more general, to satisfy the more application rather than just one. The effect is that some application may not run as fast as they used to.

10.20 TEST YOUR UNDERSTANDING (A)

1. Define DBMS. Explain various components of DBMS.

   ……
   ……
   ……
   ……

2. Difference between Data and Information.

   ……..…….
   ……
   …….

3. Fill in the Blanks
   a. ---------- allows the user to define the data and their relationship to other types of data
   b. ---------- Collection of interrelated data and a set of programs to access the data.
   c. Processed form of data is called ----------
   d. Collection of raw facts----------.

e. Row value of an Entity----------

10.21Review Question

1. Define Data and Information ?
2. Differentitate between data and information ?
3. Define data base management system ?
4. What is Traditional file processing system ?
5. Give at least three reasons why DBMS is better than traditional file processing system?
6. What are the vious users of data base ?
7. Define field, data item, record and file ?
8. What are the disadvantages of traditional file processing system ?
9. List the objectives of DBMS ?
10. What are the components of DBMS ?
11. What is the significance of system in DBMS?
12. What do you understand by Redundancy ? What characteristics of file system can lead to it ?
13. Define Mata data ?
14. What is data migration ?
15. What is DBA ?
16. What is the role of DB designer in DBMS ?
17. Define data dictionary.
18. Define instance.

Answer Key 1.20 A

1. Data base Management System
2. System
3. Information
4. Data
5. Tuple

M.COM

SEMESTER II

Course: Computer Applications in Accounting

Structure

UNIT 11: Introduction to Accounting

11.1 Introduction

Accounting is a business language. We can use this language to communicate financialtransactions and their results. Accounting is a completeorganization to collect, analyses, and communicates financial information. The source of accounting is as ancient as money. In early days, the number of transactionswas very small, so every businessman could keep the record of transactions duringa specific period of time. Twenty-three centuries ago, an Indian scholar named Kautilya introduced the accounting concepts in his book Arthashastra. In hisbook, he described the art of proper account keeping and methods of checking accounts.Accounting records can be traced back to the earliest civilizations of China, Babylonia, Greece and Egypt. Accounting was used to keep records regarding the cost of labour and materials used in building great structures like the Pyramids.

Steadily, the field of accounting has experiencednoteworthy changes in compliancewith the changes happening in the business scenario of the world.An accountant record financial

transactionsby following certain accountingprinciples and standards as prescribed,depending upon the size,description, volume, and other limitations of a particular business entity. Through the accounting process, we can ascertain the profit or loss of the businesson a specific date. It also aids us in analysing the historical performance and plan the futurecourses of action.Thus, accounting is a system meant for determining business activities, processing of transactions into reports and making the final results available to decision-makers. The documents, which communicate these findings about the performance of an organisation in monetary terms, are called financial statements.

Just like arithmetic is a procedural element of mathematics, book keeping is the procedural element of accounting. Figure 1 shows how an accounting system operates in business andhow the flow of information occurs.

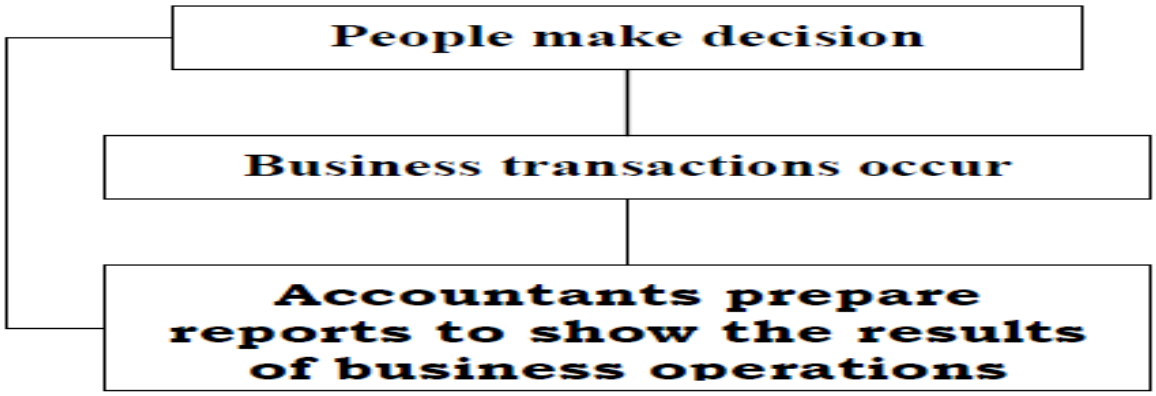


FIG 1: THE ACCOUNTING SYSTEM

11.2 Definition of Accounting

The American Institute of Certified Public Accountant has defined FinancialAccounting as:"the art of recording, classifying and summarizing in a significant manner and in termsof money, transactions and events which in part at least of a financial character andinterpreting the results thereof."

11.3 Objectives and Scope of Accounting

The main objectives of Accounting are discussed below:

a. **To keep systematic records**: Accounting is done to keep organized record of financialtransactions. The mainpurpose of accounting is to help us gather financial data andto record it methodically to get correct and useful results of financial statements.

b. **To ascertain profitability:** With the help of accounting, we can assess the profits andlosses incurred during a specific accounting period. With the help of a Trading andProfit & Loss Account, we can effortlessly determine the profit or loss of a firm.

c. **To ascertain the financial position of the business**: A balance sheet or a statement ofaffairs shows the financial position of a company as on a particular date. A correctlyprepared balance sheet gives us a view of financial health of any organisation, the financial status of the assets, the natureand value of liability, and also the capital position of the firm. With the help of that, wecan effortlesslydetermine the strength of any business entity.

d. **To assist in decision-making**: For taking financial decisions for the future, one requires accurate and reliable financial statements. One of the main intents of accounting is to take right financial decisionsat right time. Thus, accounting provides you the platform to plan for the future with thehelp of past records by doing financial forecasting.

e. **To fulfil compliance of Law**: Business entities such as companies, trusts, and societiesare being run and governed according to different legislative acts. Also, differenttaxation laws (direct and indirect tax) are also applicable to every business house. Therefore, everyone has to keep and maintain different types of accounts and records as prescribed bycorresponding laws of the land. Accounting helps in running a business in compliancewith the law.

f. **Useful for Investors and Creditors:**

   Investors and creditors are keen to evaluate the profitability andsolvency of a company before they decide to provide money to theorganisation. Therefore, they are interested to obtain financialinformation about the company in which they are contemplating aninvestment. Financial statements are the principal source of informationto them which are published in annual reports of a company and variousfinancial dailies and periodicals.

11.4 Accounting Cycle:

Accounting cycle denotes the precise tasks included in completing an accountingprocess. The length of an accounting cycle can be monthly, quarterly, half-yearly, orannually. It may differ from organization to organization but the process remains thesame. The following chart shows the basic steps in an accounting cycle:

Accounting Process / Cycle

The following are the steps followed in an accounting process:

1. Collecting and Analysing Accounting Documents: It is a very vital step in which one examine the source documents like invoice, expenses vouchers, bank statements etc., and analyze them. For example, before entering transactions in books accountants take notice of cash, bank,sales, and purchase related documents. This is anongoing process throughout the accounting period.

2. Posting in Journal: On the basis of the above documents, accountant pass journal entriesusing double entry system in which debit and credit balance remains equal. This processis repeated throughout the accounting period.

3. Posting in Ledger Accounts: Debit and credit balance of all the above accountsaffected through journal entries are posted in ledger accounts. A ledger is simply acollection of all accounts bot debit and credit. Ordinarily, this is also a continuous process for the wholeaccounting period.

4. Preparation of Trial Balance: As the name proposes, trial balance is a summary ofall the balances of ledger accounts regardless of whether they carry debit balance orcredit balance. Since, everyone follow double entry system of accounts, the total of all thedebit and credit

balance as appeared in trial balance remains equal. Typically, oneneed toprepare trial balance at the end of the said accounting period.

5. Posting of Adjustment Entries: In this step, the adjustment entries are first passedthrough the journal, followed by posting in ledger accounts to give effect to the adjustment done, and finally in the trialbalance. As in number of cases, mostly accrual basis of accounting is followed to obtain thecorrect value of revenue, expenses, assets and liabilities accounts, for this purpose, we need to do these adjustment entries. This procedure is done at the end of each accounting period.

6. Adjusted Trial Balance: After taking into account the above said adjustment entries, the next step is to createadjusted trial balance. Adjusted trial balance is a platform to prepare the financial statements of a company.

7. Preparation of Financial Statements: Financial statements are the set of statementslike Income and Expenditure Account or Trading and Profit & Loss Account, CashFlow Statement, Fund Flow Statement, Balance Sheet or Statement of Affairs Account.With the help of trial balance, we classify all the financial information into financial statements.Financial statements clearly show the financial health of a firm by portraying its profitsor losses and financial position in the form of assets and liabilities as on date.

8. Post-Closing Entries: All the different accounts of revenue and expenditure of the business entity are transferred to the Trading and Profit & Loss account at the end of the financial year. With the passing of theseentries, the balance of all the accounts of income and expenditure accounts come toNIL. The net balance of these entries which represents the profit or loss of the company is finally transferred to the owner's equity or capital account.We pass these entries only at the end of accounting period.

9. Post-Closing Trial Balance: After closing, Trial Balance represents the balances ofAsset, Liabilities & Capital account at the end of a financial year. These balances are transferred to next financialyear as an opening balance.

11.5 Accounting Concepts

The most important concepts of accounting are as follows:

a. Business Entity Concept

Business Entity is the fundamental concepts of accounting. According to this concept, the business and the owner of the business are two distinct entities. In other words, the person investing in the business and business are separate.For example, Mr Alpha starts a new industry in the name and style of M/s XYZ Enterprisesand advanced a capital of Rs

10,00,000 in cash. The result will be that the cashbalance of M/s XYZ Enterprises will increase by a sum of Rs.10,00,000/-.At the same time, the liability of M/s XYZ Enterprises in the form ofcapital will also increase. It means M/ XYZ Enterprises is liable to payRs 10,00,000 to Mr Alpha.In accounting we make a distinction between business and theowner. All the books of accounts records day to day financialtransactions from the view point of the business rather than from that ofthe owner. The proprietor is deemed as a creditor of the entity to the extent of the capital brought in the business by him. In the case of a limited company, this distinction can be easily retained because a company has a legal entity like a natural person it can engage itself in economic activities of buying, selling, producing, lending, borrowing and consuming of goods and services. Though, it is somewhat difficult to show this distinction in the case of sole proprietorship and partnership.

b. Money Measurement Concept

According to this concept**, o**nly financial transactions can be recorded in the accountingrecord which can be measured in monetary terms.In other words, a fact or transaction or event which cannot be measured in terms of money cannot be recorded in the accounting books. As money is acknowledged not only as a means of exchange but also as a store of value, it has a very significantbenefit. As various assets and equities, which are else different, can be measured and expressed in terms of a common denominator i.e. money.

This concept entails two severe weaknesses. **Firstly,** there are numerous facts which though very significant to the business, cannot be recorded in the books of accounts as they cannot be measured in money terms. For instance, general health condition of the Managing Director of the company, working conditions in which a worker has to work, sales policy followed by the undertaking, quality of product introduced by the enterprise, new competition faced by the organisation due to new products, althoughapply a great impact on the productivity and profitability of the enterprise, are not recorded in the books. Likewise, the information that a strike is about to startsinceworkers are discontented with the poor working conditions in the place of work will not be recorded even though this event is of great concern to the business. All these have aninfluence on the future profitability of the company.

Secondly, use of money infers that we accept stable or constant value of rupee. Choosing this assumption means that the changes in the money value in future dates are suitably ignored. For instance, a piece of factory land purchased in 1995 for Rs. 20lakhs and another bought for the same amount in 2005 are recorded at the same price, though the first bought in 1995 may be worth two times greater than the value recorded in the books because of rise in land prices. In fact, most bookkeepersare aware of this fact that purchasing power of rupee does

change but very few recognise this fact in accounting books and make allowance for changing price level.

c. Going Concern Concept

Our accounting is based on the notion that a business unit is a going concern. All the financial transaction of a business is recorded keeping this point of view in ourmind that a business unit is a going concern. Else, the bankerwill not offer loans, the supplier will not supply goods or services, the employeeswill not work properly, and the method of recording the transaction will changealtogether. Accounting presupposes that the business entity will continue tooperate for a long time in the future unless there is good indication to the contrary. The business is viewed as a going concern, that is, ascontinuing in operations, at least in the foreseeable future. In otherwords, there is neither the intent nor the necessity to liquidate the particular business venture in the predictable future. For of this belief, the accountant while valuing the assets does not take into account forced sale value of them. Infact, the assumption that the business is not expected to be sell out in the predictable future founds the basis for many of the valuations and allocations in accounting. For instance, the accountant charges depreciation on fixed assets. It is this assumption which inspires the decision of investors to pledge capital to enterprise. Only on the base of this assumption accounting practice can stay steady and attain the objective of appropriately reporting and recording on the capital invested, the effectiveness of management, and the position of the enterprise as a going concern.

The concept of going concern does not work in the following cases:

- If a unit is declared sick.
- When a company is going to liquidate and a liquidator is appointed for the same.
- When a business unit is passing through severe financial crisis and going to wind up.

d. Cost Concept

It is a very significant concept grounded on the Going Concern Concept. We record the valueof assets on the cost basis, not on the net realizable value or market value of the assetsbased on the assumption that a business unit is a going concern. No doubt, we decrease the value of assets providing depreciation to assets, but we ignore the market value ofthe assets.The cost concept ends any type of falsification while taking into account the netrealizable value or the market value. On the downside, this concept overlooks the effect of price rises in the market, which can from time to time be very steep. Still, the cost concept is

extensively and universally accepted on the basis of which we do the accounting of abusiness unit.The term ‘assets’ denotes the resources land building, machinery etc. owned by a business. The money values that are assigned to assets are derived from the cost concept. According to this concept an asset is usually entered on the accounting records at the price paid to acquire it. For example, if a business buys a plant for Rs. 50 lakhs the asset would be recorded in the books at Rs. 50 lakhs, even if its market value at thattime happens to be Rs. 75 lakhs. Therefore, assets are recorded at their originalpurchase price and this cost is the basis for all subsequent accountingfor the business. The term ‘book value’ isused for amount shown in the accounting records.The cost concept does not mean that all assets remain on the accounting records at their original cost for all times to come. The asset may systematically be reduced in its value by charging ‘depreciation’. Depreciation has the effect of reducing profit of each period. The prime purpose of depreciation is to allocate the cost of an asset over its useful life and not to adjust its cost. However, a balance sheet based on this concept can be very misleading as it shows assets at cost even when there are wide difference between their costs and market values. Despite this limitation you will find that the cost concept meets all the three basic norms of relevance, objectivity and feasibility.

e. Dual Aspect Concept

Financial accounting records all the transactions and eventsinvolving financial element. Each of such transactions requires twoaspects to be recorded. The acknowledgement of these two aspects of everytransaction is known as a dual aspect analysis. According to this concept every business transactions has dual effect. For instance, if a company sells goods of Rs. 5,000 this transaction involves two aspects. One aspect isthe transfer of goods and the other part is immediate receipt of cash (inthe case of cash sales). In fact, the term ‘double entry’ book keeping hascome into existence and in this system the total amount debited always equals the total amount credited. It stems from ‘dual aspect concept’that at any point of time owners’ equity and liabilities for any accountingentity will be equal to assets owned by that entity.

This view isfundamental to accounting and could be articulated as the followingequalities:

Assets = Liabilities + Owners Equity … (1)

Owners’ Equity = Assets- Liabilities … (2)

The above connection is known as the ‘Accounting Equation’. Theterm ‘Owners Equity’ signifies the funds supplied by the owners of theentity while the term ‘liabilities’ signifies the claim of external parties suchas creditors, debenture-holders, loans from the bank against the assets of the business.Assets are the resources owned by a business. The total of assets will

beequal to total of liabilities plus owner's capital as all assets of the company are claimed by either owners or outsiders.There must be a double entry to complete any financial transaction, means debit shouldbe always equal to credit. Hence, every financial transaction has its dual aspect.

f. Accounting Period Concept

The life of a business unit is indefinite as per the going concern concept. To ascertain the profit or loss of a company, and to determine its financial position, profit & loss accountsand balance sheets are made at regular intervals of time, usually at the end of eachyear. This one-year cycle is known as the accounting period. The reason of having anaccounting period is to take remedial measures keeping in view the past performances,to nullify the effect of seasonal changes, to pay taxes, etc.Based on this concept, revenue expenditure and capital expenditure are segregated.Revenues expenditure are debited to the profit & loss account to ascertain correct profitor loss during a specific accounting period. Capital expenditure comes in the class of those expenses, the advantage of which will be utilized in the next coming accountingperiods as well.Accounting period helps us establishthe correct financial position of the firm at regular intervals oftime, i.e., at the end of each accounting period.

Though a twelve-month period is adopted for external reporting, a shorter span of period, say one month or three months is applied for internal reporting purposes to assess the financial performance. This concept presents difficulty for the process of allocation of long term costs. All the revenues and all the cost relating to the year in operation have to be taken into account while matching the earnings andthe cost of those earnings for the any accounting period. This holds goodnotwithstanding whether or not they have been received in cash or paid in cash. In spite of the problems which stem from this concept, short termreports are of vital importance to owners, management, creditors and other interested parties. Hence, the accountants have no choice but to settle such difficulties.

g. Matching Concept

Matching concept is based on the accounting period concept. The expenditures of a firmfor a particular accounting period are to be matched with the revenue of the sameaccounting period to ascertain accurate profit or loss of the firm for the same period.This practice of matching is widely accepted all over the world. In reality, we match revenues and expenses during the accounting periods.Matching is the entire procedure of periodic earnings measurement, frequentlylabelled as a process of matching expenses with revenues. In other words, income earned by the enterprise during a period can be measuredonly when the revenue earned during a period is compared with theexpenditure incurred for earning that revenue.

Broadly speaking revenueis the total amount realised from the sale of goods or provision of servicestogether with earnings from interest, dividend, and other items of income.Expenses are cost incurred in connection with the earnings of revenues.Costs incurred do not become expenses until the goods or services in question are exchanged. Cost is not identical with expense sinceexpense is sacrifice made, resource consumed in relation to revenuesearned during an accounting period. Only costs that have expired duringan accounting period are considered as expenses. For instance, if acommission is paid in January, 2022, for services enjoyed in November, 2021, that commission should be taken as the cost for services rendered in November 2021. On account of this concept, adjustments are made forall prepaid expenses, outstanding expenses, accrued income, etc.,while preparing periodic reports.

h. Accrual Concept

As stated above in the matching concept, the revenue generated in the accounting periodis considered and the expenditure related to the accounting period is also considered.Based on the accrual concept of accounting, if we sell some items or we rendered someservice, then that becomes the point at which revenue is recognised or generatedregardless of whether wereceived cash or not. The same notion is relevant in case of expenses also. All theexpenses paid in cash or payable are considered and the advance payment of expenses, if any, is not taken in to account. The heart of the accrual concept is that net income arises from events that change the owner's equity in a specified period and that these are not necessarily the same as change in the cash position of the business. Thus it helps in proper measurement of income.

i. Objective Evidence Concept

According to the Objective Evidence concept, every financial entry should be supportedby some objective evidence like invoice, expenses voucher etc. Purchase should be backed by purchase bills, sale withsale bills, cash payment of expenditure with cash memos, and payment to creditors withcash receipts and bank statements. Similarly, stock should be checked by physicalverification and the value of it should be verified with purchase bills. In the absence ofthese, the accounting result will not be reliable, chances of falsification inaccounting records will be high, and no one will be able to rely on such financial statements.

j. Realisation Concept

Realisation is precisely appreciated as the process of converting non-cash resources and rights into money. As accounting principle, it is used to identify exactly the amount of revenue to be recognised and the amount of expense to be matched to such

revenue for the purpose of income measurement. According to realisation concept revenue is recognised when sale is made. Sale is measured to be made at the point when the property in goods passes to the buyer and he becomes legally liable to pay. This implies that revenue is generally realised when goods are delivered or services are rendered. The basis is that delivery legalizes a claim against the customer. Though, in case of long run construction contracts revenue is often recognised on the basis of a proportionate or partial completion method. Similarly, in case of long run instalment sales contracts, revenue is regarded as realised only in proportion to the actual cash collection. In fact, both these cases are the exceptions to the notion that an exchange is needed to justify the realisation of revenue.

11.6 Accounting Conventions

Following are the accounting conventions.

i. **Convention of Consistency**

To compare the results of different years over period of time, it is necessary that accounting rules,principles, conventions and accounting concepts for similar transactions are followedconsistently and continuously. Reliability of financial statements may be affected and lost, if there are frequent changes in following the accounting rules, principles, conventions while doing accounting treatment. For instance, if a company decidescost or market price whichever is lower method for stock valuation and written downvalue method for depreciation on fixed assets, it should be followed consistently andcontinuously over the long period of time.Consistency also states that if a change becomes necessary, the change and its effects onprofit or loss and on the financial position of the company should be clearly mentioned.In other words, accounting practices should remain unchanged from one period to another. However, this principle does not forbid introduction of improved accounting techniques. The application of the principle of consistency is essential for the purpose of comparison. One could get valid conclusions from the comparison of data extracted from the financial statements of one year with that of the other year. But the inconsistency in the application of accounting methods might significantly affect the reported data.

ii. **Convention of Disclosure**

The Companies Act, 2013, has recommended a format in which financial statements must beprepared. Every company that fall under this classification has to abide by this practice.Numerous provisions are made by the Companies Act to make these financialstatements. The main reason of these provisions is to disclose all essential

information sothat the view of financial statements should be true and fair. However, the term‘disclosure’ does not mean all information. It means disclosure of information that isof significance to the users of these financial statements, such as investors, owner, bankers, and Government Authorities and creditors.

iii. Convention of Materiality

Materiality concept affirms that items of small significance need not be given major importance. In fact, there are numerous events in business which are insignificant in nature. The cost of recording and showing in financial statement such events may not bejustified as there is no usefulnessoriginated from that information. For example, an ordinary calculator costing Rs. 200 may have life span of 5 years. Though, the effort involved in allocating its cost over the 5 years’ period is not of any value that can be derived from this exercise. The cost incurred on calculator may be treated as the expense of the period in which it is purchased. Likewise, when anaging statement of outstanding debtors is prepared for sending to top management, figures may be rounded to the nearest ten or hundred. This convention will needlesslyoverload an accountant with more details in case he is incapable to find an objective difference between material and immaterial events. It should be noticed that an item material for one party may be immaterial for another. Actually, there are no hard and fast rules to draw the demarcated line between material and immaterial events and therefore, it is a subject of judgement and common sense. In spite of this drawback, it is necessary to disclose all material information to make the financial statements clear and understandable. Materiality should govern the selection and application of accounting policies.If the disclosure or non-disclosure of information might influence the decision of theusers of financial statements, then that information should be disclosed.

iv. Conservation or Prudence

This concept necessitates that the accountants must follow the policy of ‘‘playing safe” while recording business transactions and events. That is why, the accountant follows the rule of anticipate no profit but provide for all possible losses and diminution in the value of the assets, while recording the business events. This rule means that an accountant should record lowest possible value for assets and revenues, and the highest possible value for liabilities and expenses. According to this concept, revenues or gains should be recognised only when they are realised in the form of cash or assets (i.e. debts) the ultimate cash realisation of which can be assessed with reasonable certainty. Further, provision must be made for all known liabilities, expenses and losses, Likely losses regarding all contingencies should also be provided for. ‘Valuing the stock in trade at market price or cost price whichever is less’,

‘making the provision for doubtful debts on debtors in anticipation of actual bad debts’, ‘adopting written down value method of depreciation as against straight line method’, not providing for discount on creditors but providing for discount on debtors’, are some of the examples of the application of the convention of conservatism. The principle of conservatism may also invite disapproval if not applied cautiously. For example, when the accountant creates secret reserves, by creating excess provision for bad and doubtful debts, depreciation, etc. The financial statements do not present a true and fair view of state of affairs. American Institute of Certified Public Accountant have also indicated that this concept need to be applied with much more caution and care as over conservatism may result in misrepresentation.It is a policy of playing safe. For future events, profits are not anticipated, but provisionsfor losses are provided as a policy of conservatism.

11.7 Accounting standards

The accounting concepts and conventions discussed above are the core elements in the theory of accounting. These principles, though, agree to a variety of different practices to co-exist. On account of this the financial results of different companies are difficult to compare and appraise unless otherwise full information is available about the accounting methods which have been followed. The lack of uniformity among accounting practices used by different business organisation have made it difficult to compare the financial results of different companies. It means that there should not be too much discretion to companies and their accountants to present financial information the way they like. In other words, the information contained in financial statements should conform to carefully considered standards.

Obviously, accounting standards are needed to:

a) provide a basic framework for preparing financial statements to be uniformly followed by all business enterprises,

b) Make the financial statements of one firm comparable with the other firm and the financial statements of one period with the financial statements of another period of the same firm,

c) Make the financial statements credible and reliable, and

d) Create general sense of confidence among the outside users of financial statements.

In this context unless there are reasonably appropriate standards, neither the purpose of the individual investor nor that of the nation as a whole can be served. In order to harmonise accounting policies and to evolve standards the need in the USA was felt with the establishment of Securities and Exchange Commission (SEC) in 1933. In 1957, a research

oriented organisation called Accounting Principles Boards (APB) was formed to spell out the fundamental accounting principles. After this the Financial Accounting Standards Board (FASB) was formed in 1973, in USA. At the international level, the need for standardisation was felt and therefore, an International Congress of accountants was organised in Sydney, Australia in 1972 to ensure the desired level of uniformity in accounting practices. Keeping this in view, International Accounting Standards Committee (IASC) was formed and was entrusted with the responsibility of formulating international standards. In order to harmonise varying accounting policies and practices, the Institute of Chartered Accountants of India (ICAI) formed the Accounting Standards Board (ASB) in April, 1977. ASB includes representatives from industry and government. The main function of the ASB is to formulate accounting standards. This Board of the Institute of Chartered Accountants of India has so far formulated around 32 Accounting Standards.

11.8 Classification of Accounts It is essential to have knowledge in regards to the classification of accounts and their treatment in double entrysystem of accounts. Broadly, the accounts are classified into three categories:

i. Personal AccountsPersonal accounts may be further classified into three categories:

Natural Personal Account: An account related to any individual like Sanjeev, Ronald, Ram, or Shyam is called as aNatural Personal Account.

Artificial Personal Account: An account related to any artificial person like M/s XYZ Ltd, M/s GTAENTERPRISES, etc., is called as an Artificial Personal Account.

Representative Personal Account: Representative personal account represents a group of account. If there are a number ofaccounts of similar nature, it is better to group them like salary payable account, rentpayable account, insurance prepaid account, interest receivable account, capital accountand drawing account, etc.

ii. **Real Accounts:** Every Business has some assets and every asset has an account. Thus, asset account iscalled a real account. There are two type of assets:Tangible assets are touchable assets such as plant, machinery, furniture, stock,cash, etc.Intangible assets are non-touchable assets such as goodwill, patent, copyrights,etc.Accounting treatment for both type of assets is same.

iii. **Nominal Accounts:** As this account does not represent any tangible asset, it is called nominal or fictitiousaccount. All kinds of expense account, loss account,

gain account or income accounts.come under this category of nominal account. For example, rent account, salary account,electricity expenses account, interest income account, etc.

11.9 Accounting Systems

There are two systems of accounting followed:

- Single Entry System
- Double Entry System

i. Single Entry System

Single entry system is an incomplete system of accounting, this system is followed by small businessmen, where there are very few transactions. In this system ofaccounting, only personal accounts are opened and maintained by a business owner. Occasionally subsidiary books are also maintained but not regularly. Since real and nominalaccounts are not opened by the business owner, preparation of profit & loss account andbalance sheet is difficult. Hence it is tough to ascertain the correct position of profit or loss or financialposition of business entity.

ii. **Double Entry System**: Double entry system of accounts is a scientific system of accounts followed all over theworld without any question. It is an old system of accounting. It was developed by 'LucoPacioli' of Italy in 1494. Under the double entry system of account, every entry has itsdual aspects of debit and credit. It means, assets of the business always equal to liabilities of the business.

Assets = Liabilities If we give something, we also get something in return and vice versa.Rules of Debit and Credit Under Double Entry System of Accounts

11.10 LET US SUM UP

Accounting is a business language. We can use this language to communicate financial transactions and their results. Accounting is a complete organization to collect, analyzes, and communicates financial information. It also aids us in analysing the historical performance and plan the future courses of action. Thus, accounting is a system meant for determining business activities, processing of transactions into reports and making the final results available to decision-makers. The main objectives and Scope of Accounting to keep

systematic records, to ascertain profitability, to ascertain the financial position of the business, to assist in decision-making, to fulfil compliance of Law and useful for investors and creditors. Accounting cycle denotes the precise tasks included in completing an accounting process. The length of an accounting cycle can be monthly, quarterly, half-yearly, or annually. There are number of accounting concepts to be followed for proper maintenance of accounts like business entity concept, money measurement concept, going concern concept, cost concept, dual aspect concept, accounting period concept, matching Concept, accrual concept, objective evidence concept and realisation concept. Every organisation to follow certain accounting conventions like consistency, disclosure, materiality and conservation or prudence for enhancing the reliability of the user of the financial statements. Accounts are to be classified in to personal, real and nominal. There are two accounting system namely single entry and double entry system but now a day's double entry system is in practice.

11.11 Test your Knowledge

Questions

1. What are the various interested parties which use accounting information? How is such information used?
2. Examine the role of accounting concepts in the preparation of financial statements. Do you find any of the accounting concepts conflicting with each other? Give examples.
3. Discuss briefly the basic concepts and conventions of accounting?
4. Write short notes on
   a) Going concern concept
   b) Dual aspect concept
   c) Business entity concept
   d) Convention of materiality
   e) Convention of conservatism
5. Why accounting practices should be standardised? Explain
6. Discuss about the accounting conventions followed by the accountants to prepare financial statement.

M. COM.

Semester II

Course: COMPUTER APPLICATIONS IN ACCOUNTING

Unit 12 - Accounting System using Database Management System

STRUCTURE:

12.0 Objective

After studying the Unit, you would be able to learn

- Fundamentals of data and database
- Use of MS-Excel in Accounting
- Creation and calculation on data tables
- Different accounting functions and their usage

12.1 Introduction to Data and Database

In day-to-day life or in business we need information to take decisions. Information should be accurate, precise and well presented for effective decision making. For this, we have to collect, store and process the data using software. Data is the raw facts which are gathered from different sources and may not be organized form. First we have to collect and store the data in forms of files or in database and then we have to process it to convert into meaningful information that will help us in making decisions. Database is an organized collection of interrelated data.

Computerized Accounting involves following processes:

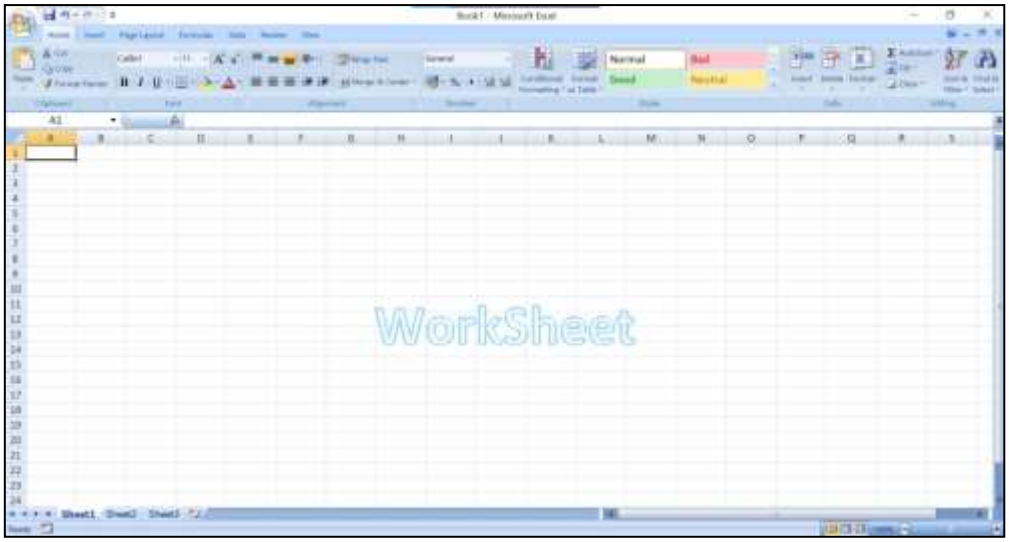
1. Identifying the Resources: The first step in computerized accounting is to identify the data resources. It may be the vouchers in which day-to-day transactions are recorded.
2. Data Capture: The data in the vouchers need to be recorded in computers for permanent storage. We need to prepare a data entry form to capture the data. The data also can be captured directly from business transactions.
3. Data Storage: A suitable storage structure is required to store the data permanently and it can access easily for further processing. It may be in tabular form consists of rows and columns.
4. Data Manipulation: The stored data is processed using the software to generate information that will help the managers in making decisions. There are formulas or functions to manipulate the data and convert it into meaningful information.
5. Reports: At the end, the reports will be generated containing output of data for making decisions. There are pre-designed accounting reports such as legers, balance sheet, profit/loss A/c, etc.

12.2 Introduction to MS-Excel

Microsoft Excel is a spreadsheet application software use to create workbooks consists of worksheets. Each worksheet is a collection of rows and columns. The data is organized in form of tables in these worksheets so that it can be easily managed. It is also used as a data manipulation, visualization and analysis tool for generating meaningful information. Excel has built in library functions for financial, logical, mathematical, statistical, text and other formulas. We can do all types of day-to-day and business calculations using these functions. It can be also used as a reporting tool that can generate different types of graphs for better visualization of data.

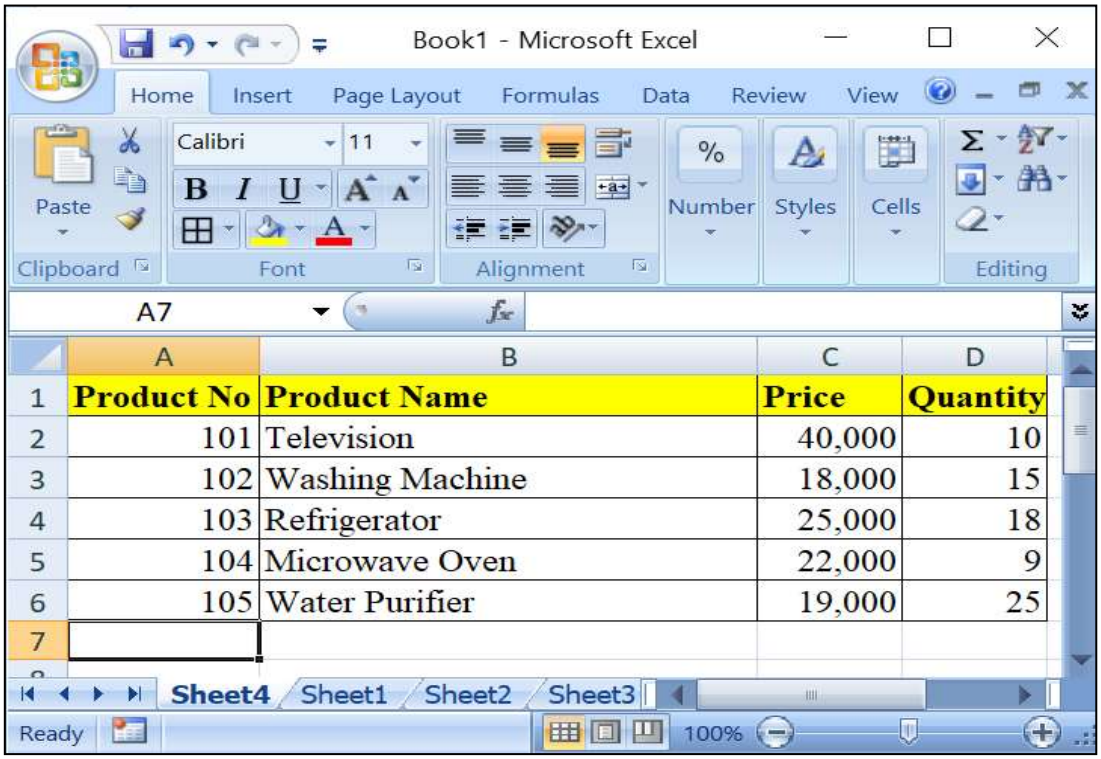
12.3 Creating Data Table

Microsoft Excel is used to store large amount of data in worksheets. One workbook has no of worksheets, consists of rows and columns. The total no of rows and cols varies from version to version. The intersection of a row and a column is known as a cell. Each cell may have data in different formats or formulas for calculations.



To create a new workbook we either go to *Office Button*/*File* menu then *New* or use shortcut key *Ctrl+N*. To open an existing file we go to *Office Button*/*File* menu then *Open* or use shortcut key *Ctrl+O*. *Shift+F11* is used to create a new worksheet. We can now define the column heading and enter the data. Select a cell to enter data or formulas. To move to the next column press *Tab* and press *Enter* to move to the next row. We may also use *arrow keys* to move to other cells.

If you want to select any data, then click on the cell. To select multiple continuous data, from the first cell drag the cursor to the end. To select the entire row and column click the row number (1,2…) and column name(A,B...).



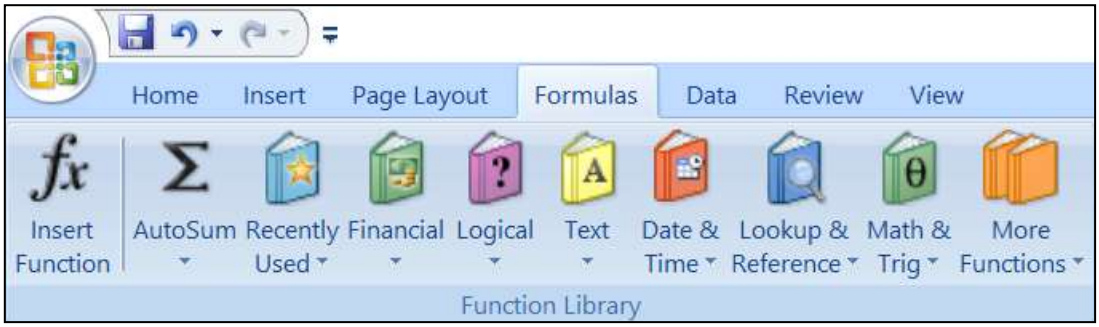
	A	B	C	D
1	**Product No**	**Product Name**	**Price**	**Quantity**
2	101	Television	40,000	10
3	102	Washing Machine	18,000	15
4	103	Refrigerator	25,000	18
5	104	Microwave Oven	22,000	9
6	105	Water Purifier	19,000	25
7				

For other basic operations following shortcut keys are used.

Select entire worksheet	Ctrl + A
Save the Workbook	Ctrl + S
Copy data in a Cell	Ctrl + C
Paste data in a Cell	Ctrl + V
Cut data in a Cell	Ctrl + X
Move to the First Cell	Ctrl + Home
Move to the Last Used Cell	Ctrl + End
Move to the Last Column	Ctrl + →
Move to the Last Row	Ctrl + ↓
Move to the First Column	Ctrl + ←
Move to the First Row	Ctrl + ↑

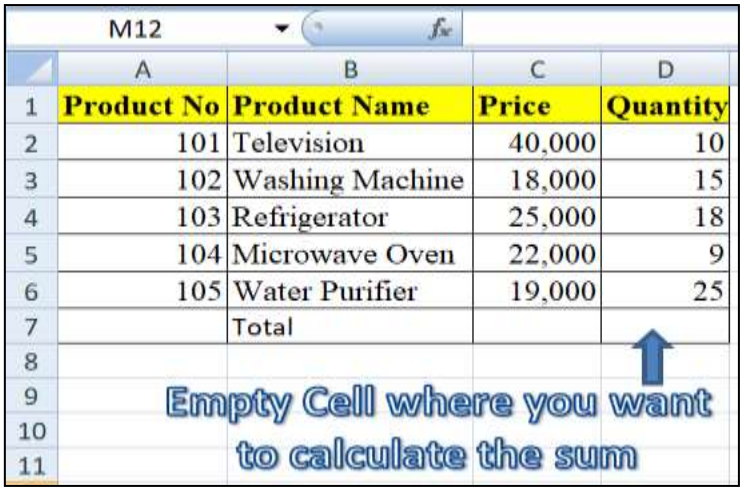
12.4 Calculations on Data Table

In Microsoft Excel we can do day-to-day calculations like addition, subtraction, multiplication, division, and etc. There are multiple ways to do these operations on rows or columns. We may use our own formula or library functions in the cells to do the calculations.



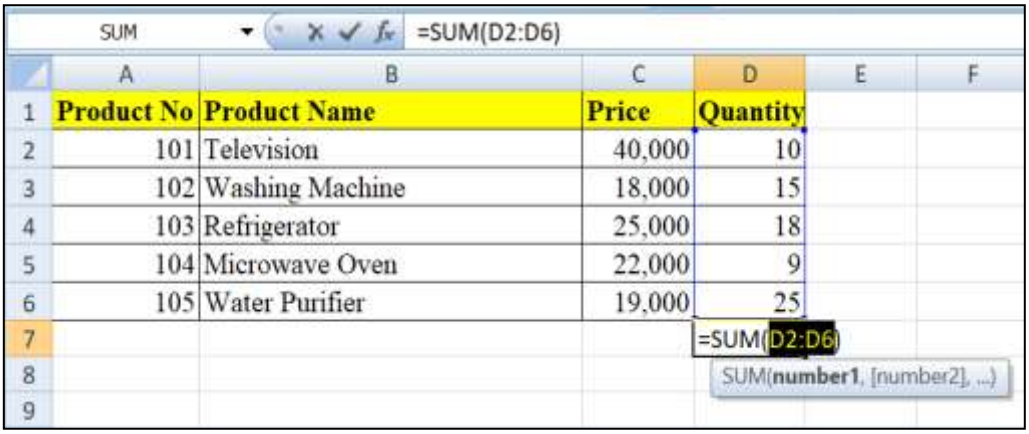
If you select continuous data cells, the sum will be automatically displayed on the status bar of the Excel. You may also use auto sum or SUM formula to do the same. In formula bar we may also write the formula starting with = for any calculation using following steps.

Step1: Place the cursor on the empty cell bellow the column where you want to calculate the total sum.



	A	B	C	D
1	**Product No**	**Product Name**	**Price**	**Quantity**
2	101	Television	40,000	10
3	102	Washing Machine	18,000	15
4	103	Refrigerator	25,000	18
5	104	Microwave Oven	22,000	9
6	105	Water Purifier	19,000	25
7		Total		

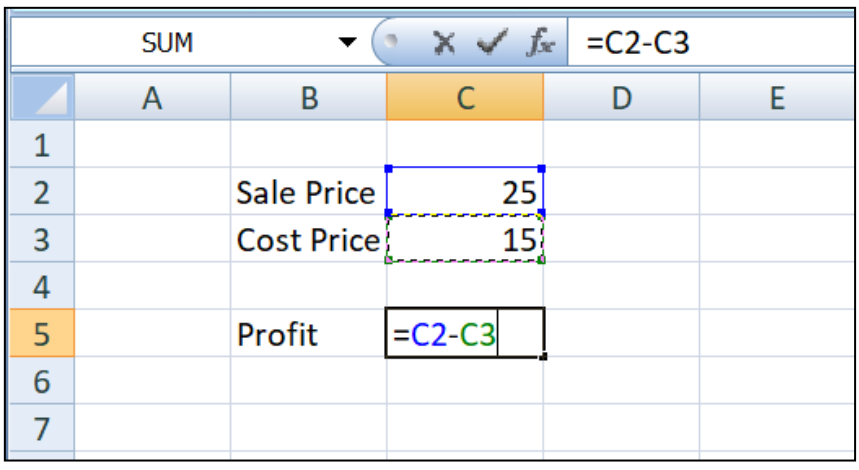
Step2: Start typing the formula starting with = sign followed by the formula or function. In the parameter mention the range of cells for which you want to calculate the sum. Then press enter key to find the result.



	A	B	C	D	E	F
1	**Product No**	**Product Name**	**Price**	**Quantity**		
2	101	Television	40,000	10		
3	102	Washing Machine	18,000	15		
4	103	Refrigerator	25,000	18		
5	104	Microwave Oven	22,000	9		
6	105	Water Purifier	19,000	25		
7				=SUM(D2:D6)		
8				SUM(number1, [number2], ...)		
9						

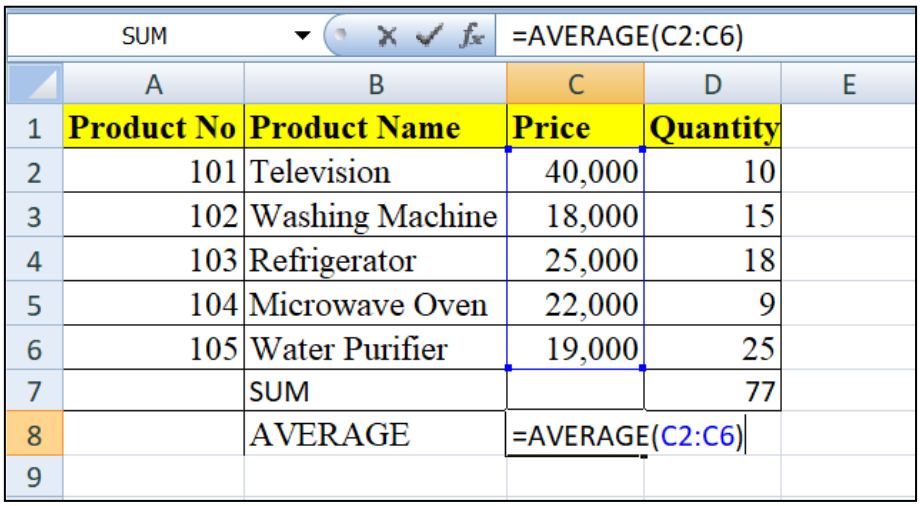
Like SUM other functions can be also used using same procedure. Using these functions calculations will be faster and efficient.

For subtraction select the cell where to display the result as C5 in figure below. Type = followed by first cell C2 then – then select the second cell C3. To get the result in C5 press the Enter key.



	A	B	C	D	E
1					
2		Sale Price	25		
3		Cost Price	15		
4					
5		Profit	=C2-C3		
6					
7					

Like addition and subtraction we can also find average of a set of data using AVERAGE function in Excel. The AVERAGE function calculates the average of a set of data by taking the value, range or reference to the cell as argument.



	A	B	C	D	E
1	**Product No**	**Product Name**	**Price**	**Quantity**	
2	101	Television	40,000	10	
3	102	Washing Machine	18,000	15	
4	103	Refrigerator	25,000	18	
5	104	Microwave Oven	22,000	9	
6	105	Water Purifier	19,000	25	
7		SUM		77	
8		AVERAGE	=AVERAGE(C2:C6)		
9					

The Average function includes Zero values but ignore empty and text values. There is another function AVERAGEA which include all values including text value as zero. It includes Zero values but ignores empty cells. AVERAGEIF also can be used to find the average of values based on a given condition.

Check Your Progress

1. MS-Excel is a flat file database which organizes the data in forms of tables, rows and columns**.** (True/False)
2. Microsoft Excel is a system software use to create workbooks consists of worksheets. (True/False)
3. What is the shortcut key to create a new worksheet in MS-Excel?
4. What is the shortcut key to move to the last used cell in the worksheet?
5. What is the shortcut key to create a new workbook in MS-Excel?

12.5 MS-Excel Functions for Accounting

Microsoft Excel is also used for accounting and budgeting. In small organization, Excel may be used to maintain records of accounts. The financial statements and balance sheet can be prepared in MS-Excel. MS-Excel can be integrated with other legacy software platforms for import and export of financial data. The financial data can be organized into accountancy tables using formulas, predefined functions and templates.

Accounting Formulas and Functions in Excel

1. **COUNT( ):** This function count no of cells containing values.

=COUNT(value1,[value2],…) OR =COUNT(range of cells)

D8 =COUNT(D2:D6)

	A	B	C	D	E
1	**Product No**	**Product Name**	**Price**	**Quantity**	
2	101	Television	40,000	10	
3	102	Washing Machine	18,000	15	
4	103	Refrigerator	25,000	18	
5	104	Microwave Oven	22,000	9	
6	105	Water Purifier	19,000	25	
7					
8			COUNT	5	
9					

Above example counts no of cells containing values in the range D2:D6.

2. **COUNTIF( ):** Counts no of cells containing values based on a condition.

=COUNTIF(range, criteria)

D8 =COUNTIF(D2:D6,">=15")

	A	B	C	D	E
1	**Product No**	**Product Name**	**Price**	**Quantity**	
2	101	Television	40,000	10	
3	102	Washing Machine	18,000	15	
4	103	Refrigerator	25,000	18	
5	104	Microwave Oven	22,000	9	
6	105	Water Purifier	19,000	25	
7					
8			COUNTIF	3	
9					

Above example counts no of cells containing values >=15 in the range D2:D6.

3. **COUNTIFS( ):** Counts the no of cells containing values based on multiple criteria.

=COUNTIFS(range1,criteria1,[range2,criteria2],…)

- This function can be used with condition or criteria based on numbers, text, date and other conditions.
- It supports logical operators (>,<,< >,=)
- It supports wildcard characters '*' and '?' for partial matching.

D8 =COUNTIFS(D2:D6,">=15",C2:C6,">=20000")

	A	B	C	D	E	F
1	**Product No**	**Product Name**	**Price**	**Quantity**		
2	101	Television	40,000	10		
3	102	Washing Machine	18,000	15		
4	103	Refrigerator	25,000	18		
5	104	Microwave Oven	22,000	9		
6	105	Water Purifier	19,000	25		
7						
8			COUNTIFS	1		
9						

Above example counts no of cells containing values in the range based on two conditions.

1. Quantity should be >=15
2. Price should be >= 20000

4. **ROUND( ):** This function is used to set the no of decimal places for the result**.**

=ROUND(Value,No of Decimal Places)

F16

	A	B	C	D
1	**Product No**	**Product Name**	**Price**	**Quantity**
2	101	Television	40,000.4565	10
3	102	Washing Machine	18,000.0000	15
4	103	Refrigerator	25,108.2000	18
5	104	Microwave Oven	22,000.0000	
6	105	Water Purifier	19,000.0000	25
7				
8		TOTAL PRICE	1,24,108.6565	
9		ROUND(two digits)	1,24,108.66	ROUND(C8,2)
10		ROUND(zero digit)	1,24,109.00	ROUND(C8,0)
11		ROUND(closest ten)	1,24,110.00	ROUND(C8,-1)

5. **SUMIF( ):** Find the sum of values based on condition or criteria

=SUMIF(range, criteria, [sum range])

D16

	A	B	C	D
1	**Product No**	**Product Name**	**Price**	**Quantity**
2	101	Television	40,000.4565	10
3	102	Washing Machine	18,000.0000	15
4	103	Refrigerator	25,108.2000	18
5	104	Microwave Oven	22,000.0000	9
6	105	Water Purifier	19,000.0000	25
7	101	Television	40,000.4565	8
8				
9		SUMIF(D2:D7,">=15")		58
10		SUMIF(D2:D7,"Television",B2:B7)		18

SUMIF(D2:D7,”>=15”) : Sum the values >=15 in the range D2:D7.

SUMIF(D2:D7,”Television”,B2:B7): Sum of Televisions

6. **Compound Interest:**

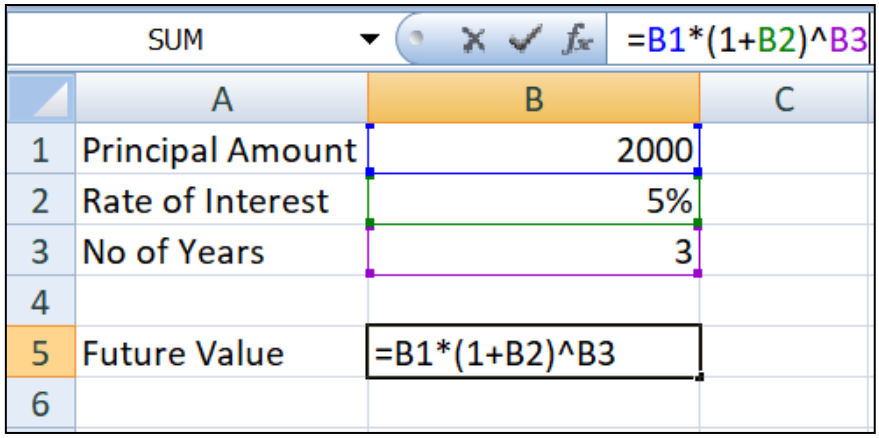
The future value at a constant rate of interest of an investment can be calculated using following formula.

=p*(1+r)^n

p -> Principal Amount

r -> Rate of interest per year

n -> No of periods of investment



The rate of interest can be monthly, quarterly and bi-annually also.

7. **FV( ):** The future value of investment can be also calculated using FV( ) function.

=FV(rate,nper,pmt,[pv],[type])

rate: Rate of interest per period

nper: No of compounding period

pmt: Additional payment per period

pv: Principal Investment (Optional)

type: “0” represent payment at the end of the period and “1” represent payment at the beginning of the period. (Optional)

- Units for *rate* and *nper* must be consistent.
- Payment value must be negative, if *pmt* is for cash out.
- Payment value must be positive, if cash received.

Example:

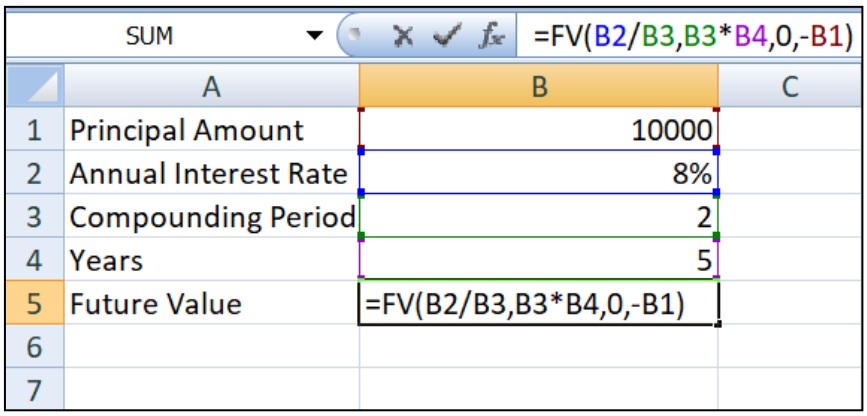
Future value =FV(B2/B3,B3*B4,0,-B1)

B2/B3 – Rate of interest per period

B3*B4 – No of compounding period

0 – Additional payment per period

B1 – Principal Investment



8. **PMT( ):** This function is used to find the payment for a loan, based on constant rate of interest and constant payment.

=PMT(rate,nper,pv,[fv],[type])

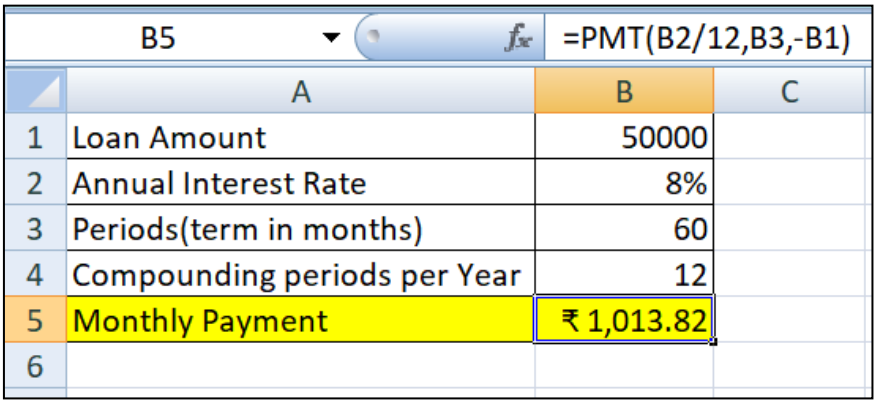
rate: Rate of interest

nper: Total no of payments

pv: Principal Value

fv: Balance after last Instalment [Optional]

type: '0' - Payment at the end of the period, '1'- Payment at beginning of the period.[Optional]



9. **IPMT( ):** It is used to find the interest portion on fixed loan payment for a given period.

=IPMT(rate, per,nper,pv,[fv],[type])

rate: Rate of interest

per: Period to find the interest

nper: Total number of payments period in a year

pv: Principal Value

fv: Balance after the last instalment. (Default Value= 0) [Optional]

type: "0" – Payment at the end of the period and "1" – Payment at the beginning of the period.[Optional]

B6 =IPMT(B2/12,1,B3,-B1)

	A	B	C
1	Loan Amount	50000	
2	Annual Interest Rate	8%	
3	Periods(term in months)	60	
4	Compounding periods per Year	12	
5	Monthly Payment	₹ 1,013.82	
6	Interest Portion in period 1	₹ 333.33	
7			

10. **VLOOKUP( )** : This function is used to search for a value in a large table based on conditions. It is used find the exact match or the closest match.

=VLOOKUP(lookup_value,table_array,col_index_num,[range_lookup])

D10 =C10*VLOOKUP(B10,$A$2:$E$6,5,FALSE)

	A	B	C	D	E
1	**Product No**	**Product Name**	**Price**	**Stock**	**Incentive per Item**
2	101	Television	40,000.46	10	500
3	102	Washing Machine	18,000.00	15	300
4	103	Refrigerator	25,108.20	18	400
5	104	Microwave Oven	22,000.00	9	350
6	105	Water Purifier	19,000.00	25	300
7					
8					
9	**Emp Name**	**Product No**	**Quanity Sale**	**Total Incentive**	
10	Rahul	101	2	1000	
11	Somen	103	3	1200	
12	Abishek	104	1	350	
13	Rajiv	101	3	1500	
14					

In the above example, to calculate the total incentive for an employee we search for the incentive per one unit in the master table using following formula and multiply with quantity sale.

Total Incentive = C10*VLOOKUP(B10,$A$2:$E$6,5,FALSE)

B10 – The cell value that we want to search in master table.

$A$2:$E$6 – The table array representing the master table.

5 – The column no of the master table from where we want to extract information

FALSE- for the exact match. We may also use TRUE for the closest match

Check Your Progress

6. Which function is used to count values based on a condition?

7. Which function is used to set the no of decimal places for the value?

8. Which function is used to find the sum of values based on condition or criteria?

9. Which function is used to find the payment for a loan, based on constant rate of interest and constant payment?

10. Which function is used to find the interest portion on fixed loan payment for a given period?

12.6 Summary

MS-Excel is a powerful tool for accounting calculations. The day-to-day transactions can be recorded in MS-Excel as a data table. There are predefined functions to process these data and generate reports. Predefined templates are available for accounting reports like balance sheet, profit loss account, etc. MS-Excel can be also used as database for other legacy software. For small organization all the financial data can be recorded in worksheets, those can be used for business processes and decision making.

12.7 Keywords

DATA	Raw facts and figures gathered from different sources and may not be organised form.
INFORMATION	Organised form of data that may be used for further processing.
DATABASE	Organised collection of interrelated data.
WORKBOOK	Collection of worksheets, those hep to organise data.
WORKSHEET	Collection of cells organised in rows and columns

12.8 Answer to Test Your Progress

1.	True	6.	COUNTIF
2.	False	7.	ROUND
3.	Shift+F11	8.	SUMIF
4.	Ctrl+End	9.	PMT
5.	Ctrl+N	10.	IPMT

12.9 Terminal Questions

1. Describe the five processes in computerized accounting.
2. Describe the application of MS-Excel for accounting.
3. Describe different COUNT functions with example.
4. Describe the FV function with example.
5. Describe VLOOKUP function with example.

12.10 Assignment

1. Describe five accounting functions in Ms-Excel with example.
2. Describe the five processes in computerized accounting.