**GBA (S5) 04**

**Exam Code : CAM**

## Computer Application in Management

**SEMESTER V**

# BACHELOR OF BUSINESS ADMINISTRATION

**BLOCK - 2**

**KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY**

## Subject Experts

1. Professor Nripendra Narayan Sarma, Maniram Dewan School of Mangement, KKHSOU
2. Professor Munindra Kakati, VC, ARGUCOM
3. Professor Rinalini Pathak Kakati,Dept.of Busniess Administration, GU

**Course Co-ordinator :** Dr.Chayanika Senapati, Asst. Prof., KKHSOU
Dr. Smritishikha Choudhury, Asst. Prof., KKHSOU

## SLM Preparation Team

| UNITS | CONTRIBUTORS |
|---|---|
| 9 & 10 | Late Mr. Ripunjay Bora, GU |
| 11,12,13 &14 | Ms. Himadri Das, Pragjyotish College |
| 15 | Ms. Shruti Shruba Bharali, KKHSOU |

## Editorial Team

**Content** : Mr. Ridip Dev Choudhury, IDOL,GU(Unit 9 & 10)
Dr Sanjib Kalita,GU (Unit 11)
Dr Devajeet Goswami, KKHSOU (Unit 14)
Dr Dipankar Malakar,KKHSOU (12,13 & 15)

**Language :** Retd. Prof. Robin Goswami, Cotton College

**Structure, Format & Graphics**: Dr. Chayanika Senapati, KKHSOU
Dr. Smritishikha Choudhury, KKHSOU

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**Headquarters: Patgaon, Rani Gate, Guwahati-781017**
**City Office: Housefed Complex, Dispur, Guwahati-781006; Web: www.kkhsou.in**

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# BACHELOR OF BUSINESS ADMINISTRATION

## COMPUTER APPLICATION IN MANAGEMENT

## DETAILED SYLLABUS

### BLOCK-2


**UNIT 9. MS Powerpoint** **Page : 219-242**

Starting of Microsoft Power Point, Part of Power Point,Creation of Power Point presentation, To include a chart in the slide, To impart a data sheet, Formatting Options, Slide Transaction, Different views of the Presentation,

**UNIT 10. Information Technology** **Page : 243-265**

Areas of Information Technology, Advantages and Disadvantages, Application of Information Technology,

**UNIT 11. Introduction to E-Commerce** **Page : 266-288**

Meaning of e-commerce; Nature of e-commerce; Types of E-commerce : Business to Customer E-Commerce, Customer to Customer E-Commerce, Business to Business E-Commerce, Business to Government; Comparison between Traditional Commerce and E-Commerce; Advantages and Disadvantages of E-commerce; Reasons for Transacting On- Line; Categories of E-commerce : Electronic Markets, Electronic Data Interchange (EDI), Internet Commerce

**UNIT 12. E-Business** **Page : 289-300**

Internet Book Shops; Grocery Supplies; Software Supplies and Support; Electronic Newspapers; Internet Banking; Virtual Auctions;Online Share Dealing, Gambling on the Net, Web Booking System

**UNIT 13. Technology for online business** **Page : 301-317**

Internet : History of Internet, Client – server, TCP/IP; IT Infrastructure : Characteristics of IT Infrastructure, Elements of IT Infrastructure; Middleware; Contents: Integrating text and E-business application : Hypertext, Hyper Media, HTTP

**UNIT 14. Payment Through Internet** **Page : 318-333**

Online Payment Mechanism; Electronic Payment System : Credit Card Payment, Electronic Fund Transfer, Electronic Cheque Payment, Electronic Cash; Payment Gateways; Visitors to Website; Plastic Money; Electronic Payment Security

**Unit 15: Cyber Crimes** **Page : 234-348**

Cyber Crime; Hacking; Digital Forgery; Identity Theft; Cyber Stalking; Cyber Terrorism; Cyber Defamation; Software Piracy; Information Technology Act, 2000in economic development, Problems of small scale units.

## BLOCK INTRODUCTION

This is the second block of the courses in Computer Application in Management. This block introduces us to the subject- Computer and its application and will also focus on the different aspects of electronic commerce. .The study of computer is very interesting as it enables us to explain some of the basic problems of our life.

This block consists of eight units.

The ninth unit is about MS Power Point. This unit explain about Starting of Microsoft Power Point, Part of Power Point,Creation of Power Point presentation, To include a chart in the slide, To impart a data sheet, Formatting Options, Slide Transaction, Different views of the Presentation,

The tenth unit explains about Information Technology. Here we will discuss different application of Information Technology.

The eleventh unit is about meaning of e-commerce; Nature of e-commerce; Types of E-commerce : Business to Customer E-Commerce, Customer to Customer E-Commerce, Business to Business E-Commerce, Business to Government; Comparison between Traditional Commerce and E-Commerce; Advantages and Disadvantages of E-commerce; Reasons for Transacting On- Line; Categories of E-commerce : Electronic Markets, Electronic Data Interchange (EDI), Internet Commerce

The twelfth unit discusses on the Internet Book Shops; Grocery Supplies; Software Supplies and Support; Electronic Newspapers; Internet Banking; Virtual Auctions; Online Share Dealing, Gambling on the Net, Web Booking System

Thirteenth unit ias about Technology for online business, Internet : History of Internet, Client – server, TCP/IP; IT Infrastructure : Characteristics of IT Infrastructure, Elements of IT Infrastructure; Middleware; Contents: Integrating text and E-business application : Hypertext, Hyper Media, HTTP

The fourteenth unit is about Payment Through Internet, Online Payment

Mechanism; Electronic Payment System : Credit Card Payment, Electronic Fund Transfer, Electronic Cheque Payment, Electronic Cash; Payment Gateways; Visitors to Website; Plastic Money; Electronic Payment Security

The fifteenth unit is about Cyber Crimes Cyber; Hacking; Digital Forgery; Identity Theft; Cyber Stalking; Cyber Terrorism; Cyber Defamation; Software Piracy; Information Technology Act, 2000in economic development, Problems of small scale units.

The structure of Block 2 is as follows :

**UNIT 9: MS Powerpoint**

**UNIT 10: Information Technology**

**UNIT 11: Introduction to E-Commerce**

**UNIT 12: E-Business**

**UNIT 13: Technology for online business**

**UNIT 14: Payment Through Internet**

**UNIT 15: Cyber Crimes**

# UNIT 9 : MS POWERPOINT

## UNIT STRUCTURE


9.1 Learning Objectives

9.2 Introduction

9.3 Starting of Microsoft PowerPoint

9.3.1 Part of PowerPoint Window

9.4 Creation of PowerPoint Presentation

9.5 To Include a Chart in the Slide

9.6 To Impart a Data Sheet

9.7 Formatting Options

9.8 Slide Transition

9.9 Different Views of the Presentation

9.10 Let Us Sum Up

9.11 Further Reading

9.12 Answer to Check Your Progress

9.13 Model Questions


## 9.1 LEARNING OBJECTIVES

After going through this unit you will be able to

- define how to start MS PowerPoint
- explain Parts of PowerPoint Window
- define Creation of PowerPoint presentation
- explain Saving the PowerPoint presentation
- Outline Chart in a slide
- explain Imparting Data sheet from a file
- Outline Formatting the slides
- define Slide transactions
- explain Different views of the presentation.

## 9.2 INTRODUCTION

Microsoft PowerPoint is a most widely used utility to create presentation relating to products, organisation, research papers etc. This

presentation can be created at ease and with immense speed. This is effective software which provides techniques for designing the dynamic presentations. Using this software a slide can be designed, text can be inserted, graphics can be inserted and animation can be given to the slides and the objects within the slide.

## 9.3 STARTING OF MICROSOFT POWERPOINT

Following steps are undertaken to start Microsoft PowerPoint.

1) Move the mouse pointer over the start button present on the extreme left of the task bar and then click the left mouse button. A push up menu appears.
2) Place the mouse pointer over the program option inside the push up menu. A second menu gets displayed immediately.
3) Move the mouse pointer over Microsoft PowerPoint option and click the left mouse button. You will get the screen as shown below **Fig. 9.1**.

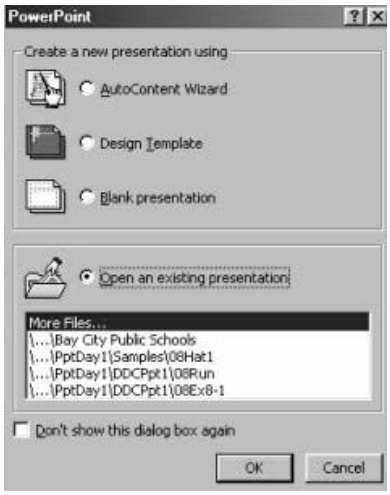



**Fig. 9.1**

4) You can create a new presentation by one of the methods given below :
   a) Auto Content Wizard
   b) Design Template
   c) Blank presentation

Each of this presentation method can be selected using the radio button adjacent to each of themm or You can open an existing presentation.

**Let us Consider Blank Presentation :** You can create a blank presentation by clicking an OK of the below shown menu as already, radio button next to Blank presentation is selected.

After following the above mentioned steps you will get a screen as shown below **Fig. 9.2**. Different parts of the following figure is given below :

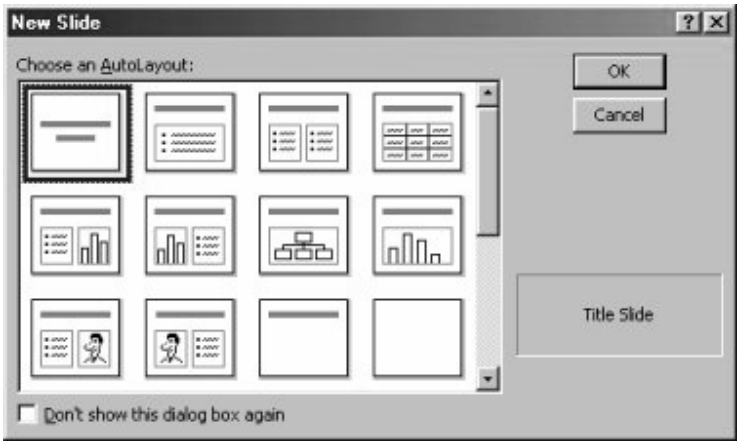



**Fig. 9.2**

### 9.3.1 Parts of PowerPoint Window

1) **Title Bar :** Display the application name, file name and various window controlled like minimize button, maximise button and close button.
2) **Menu Bar :** Different options for selection.
3) **Standard Tool Bar :** Displayed by default, allows to give common commands like saving the file, opening a file, printing etc.
4) **Formatting Tool Bar :** allows the user to give commands related to formatting cells and cell contents like Bold, Underline, Font Style, Font Size, color etc.
5) **The Drawing Palette :** This is used to draw different shapes.
6) **View Bar :** This is used to change the view of the screen.

## 9.4 CREATION OF POWERPOINT PRESENTATION

**Slide Layouts :** Each PowerPoint presentation can have only one slide or it can have more than one slide. Each of these slides can have its own page layout associated with it in the presentation. The page layout

decides the position of the various objects like text, picture etc. in the slide. Page layout also specifies the appearance of the text like its style, color, size etc.

PowerPoint provides 24 different types of page layouts along with a blank page.

**Steps to create PowerPoint presentation follow the given steps to create the PowerPoint presentation :**

1) Select the slide layout by moving the mouse pointer over the required layout and click the left mouse button, then click on OK or you can cancel the selection by clicking on the Cancel.

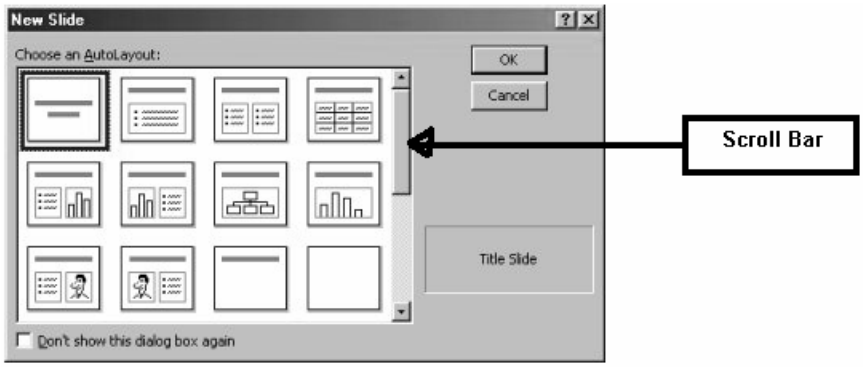



**Fig. 9.3**

Each of the these layouts has different names like Title slide, Bulleted List, Table, Organization, Charts etc.as discussed earlier 24 different layouts are available. On the screen 12 layouts are visible use scroll bar to see the other layouts.

The above selected layout has the name Bulleted list. On clicking OK you will get the screen as shown below :




**Fig. 9.4**

2) To add text to the upper box as given in the box Click the mouse pointer inside the box. Now you can type any text you want. Say for example K. K. Handiqui State Open University.

3) Now to add text to the lower box click inside that box and start typing the text you want to add. You will get the screen as shown in **Fig. 9.5**.

i

**Fig. 9.5**

4) Save this presentation. Use save icon of Standard tool bar or file option of Menu bar. While saving give the name for the presentation.

5) To view the slide show Click on to Slide show option which is on the Click on to view show you screen **Fig. 9.6**.

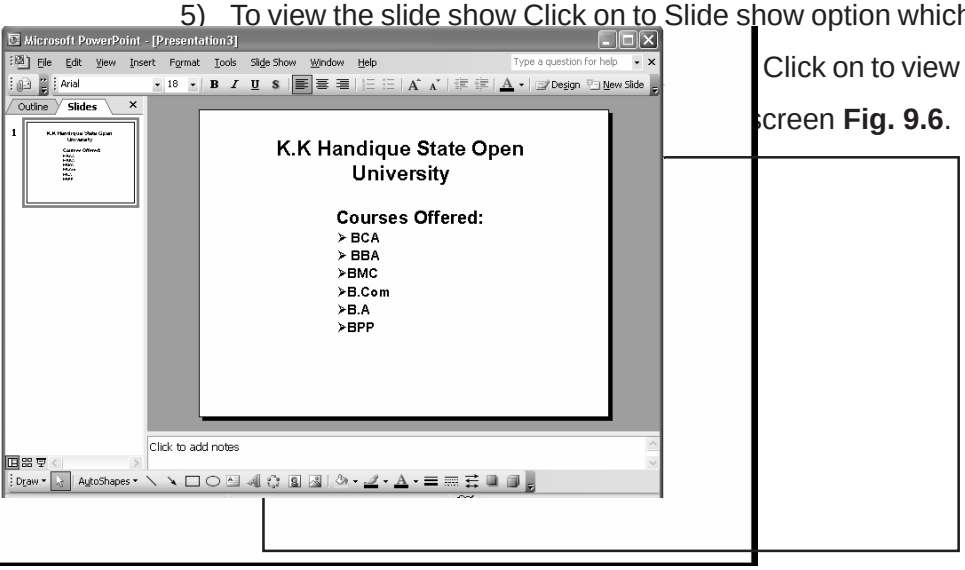



**Fig. 9.6**

**Note :** Press function key F5 to see the slide show instead of step 5. To come back from the slide show to the PowerPoint menu press Esc Key.

**Adding more Slide to an existing presentation :** Consider the presentation already created above and follow the steps given below to add more slides to an existing presentation.

1) Be in the above created presentation (**Fig. 9.5**) Click on to insert option on the menu bar. From the drop down menu click on to New Slide option. or Press Ctrl and M simultaneously being in the above-created presentation (**Fig. 9.5**)or Click on to New Slide icon which is on the Standard tool Bar being in the above created presentation (**Fig. 9.5**)
2) You will get the slide layout menu and now you can select a required layout for the slide and enter the text in the slide. Let us assume that we have selected table layouts. It is shown in **Fig. 9.7**.

**Fig. 9.7**

3) Now click on OK you will get the screen as shown in **Fig. 9.8**.

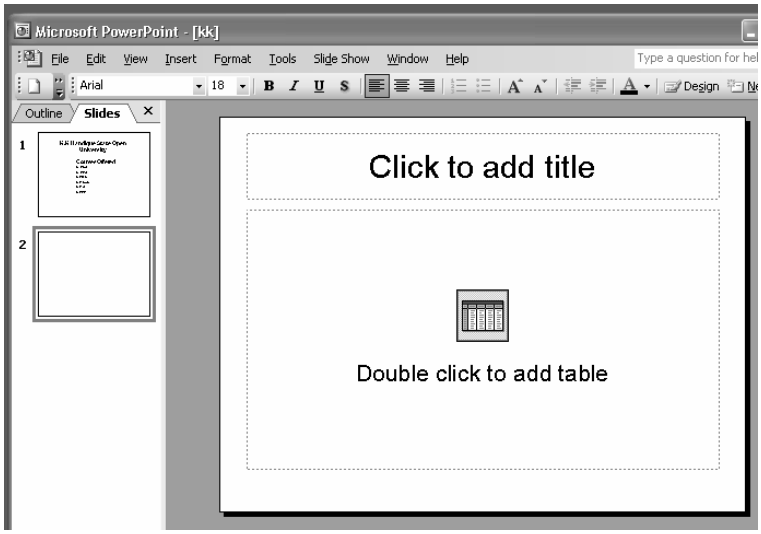



**Fig. 9.8**

4) Now you can add title in the upper box.
5) Now double click on to the lower box. You will get a menu as shown in **Fig. 9.9**.

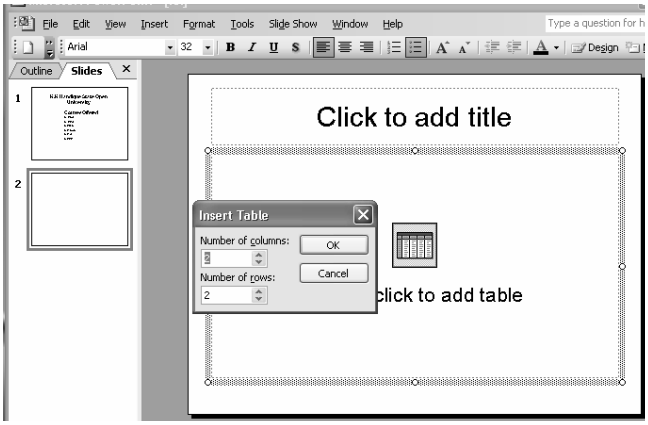



**Fig. 9.9**

6) Here you select the number of rows and columns you want in the table by using small arrows present adjacent to Number of Columns and number of rows box. Then click which is present in the insert table menu. You will get the screen as shown in **Fig. 9.10**.

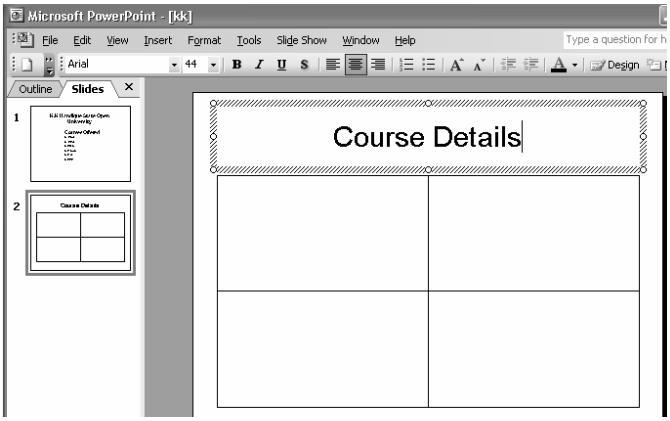



**Fig. 9.10**

7) How you can enter the contents in this table shown in **Fig. 9.11** Microsoft Powerpoint (Presentation)

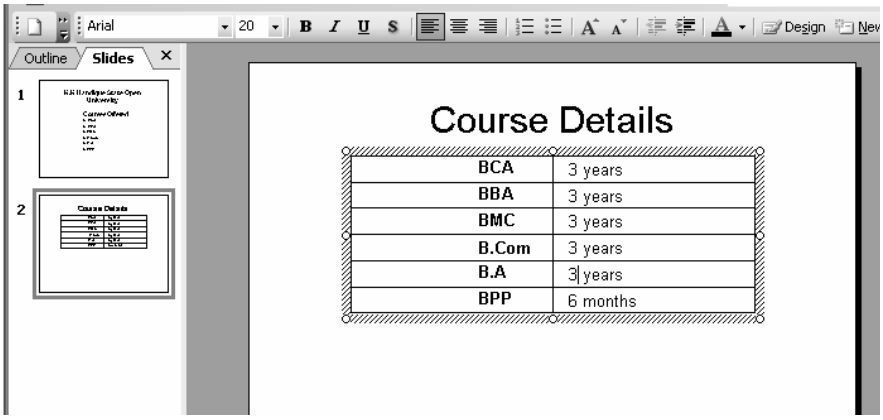



**Fig. 9.11**

8) Save the presentation.

9) Run the slide show by pressing F5.

**Note :** When you press F5 it will show the first slide not to go to the second slide press space bar key of the key board.

**To add a slide with picture for the existing presentation :** Consider the presentation already created above and follow the steps given below to add more slides to an existing presentation.

1) Be in the above-created presentation (**Fig. 9.11**). Click on to Insert option on the Menu Bar. From the drop down menu click on to New Slide option or Press Ctrl and M simultaneously being in the above-created presentation (**Fig. 9.11**). or Click on to New slide icon which is on the Standard tool bar being in the above created presentation (**Fig. 9.11**)

2) You will get the slide layout menu and now you can select a required layout for the slide and enter the text and picture in the slide. Let us assume that we have selected layout as shown in **Fig. 9.12**.

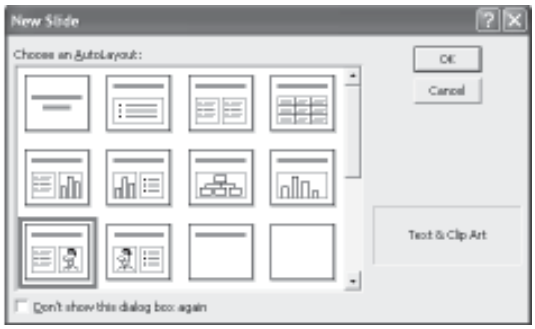



**Fig. 9.12**

3) Now click on OK you will get the screen as shown in **Fig. 9.13**.

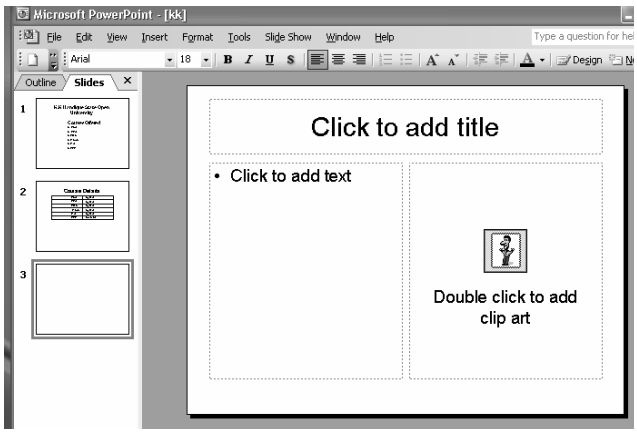



**Fig. 9.13**

4) Add Title to the slide and add text at the left hand box shown.

5) To add the picture at the right box follow the steps given below.

a) Double click as instructed in the box you will get a menu as shown in **Fig. 9.14**.

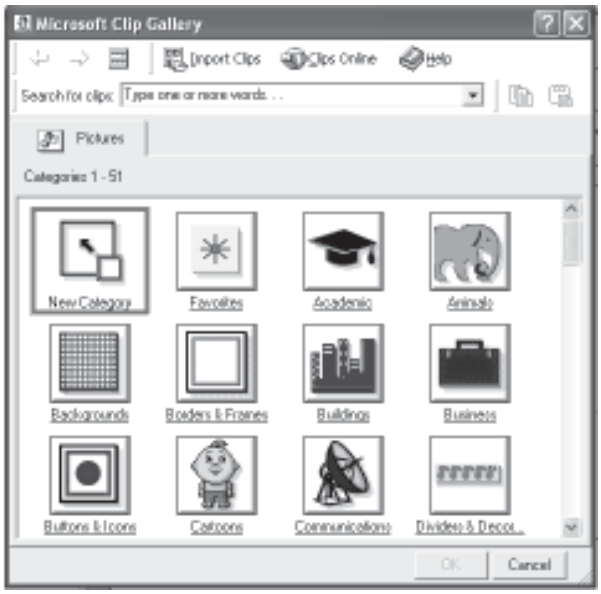



**Fig. 9.14**

b) Now you can select any of the titles among the available ones as shown in **Fig. 9.14**. For example we have selected "Academic". Again you will get a menu, **Fig. 9.15** which contains different pictures. Now click on the picture you want to insert and Click on to OK on that menu you will get the slide as shown in **Fig. 9.16**.




**Fig. 9.15**

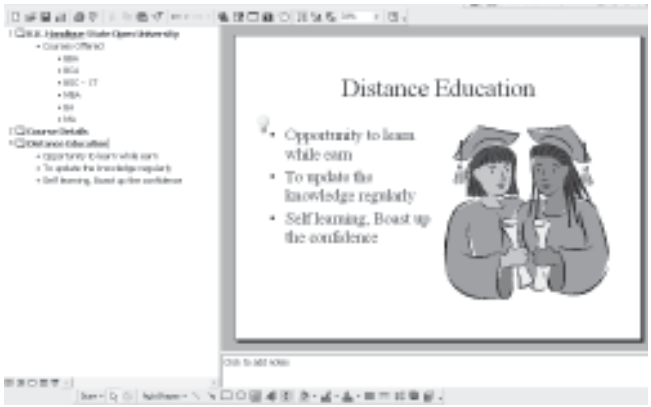



**Fig. 9.16**

c) Save the presentation as discussed earlier.

**Note :** To insert the pictures from the file.... 1) Execute the step (a) of the above steps,

6) Clip on to the import clips item you will get **Fig. 9.17**.

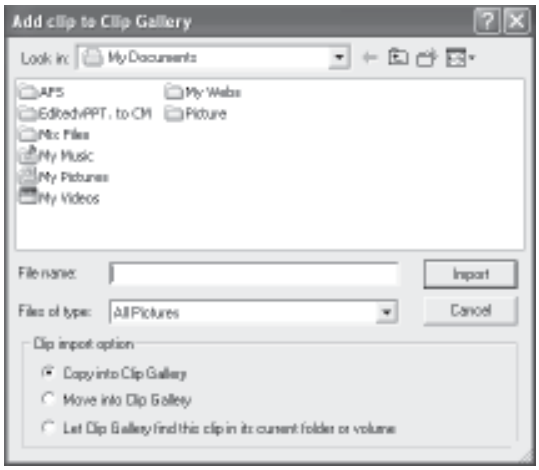



**Fig. 9.17**

7) Select the file from where you want to insert the file. You can select required drive and required folder.

8) Click on to Import item. You will get a menu as shown in **Fig. 9.18**.

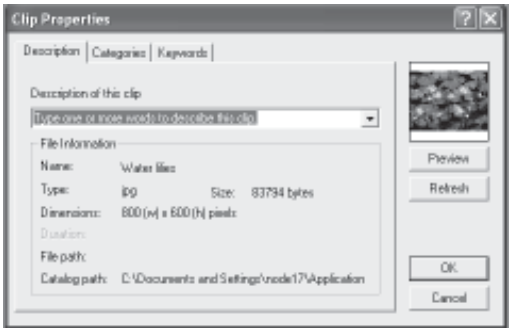



**Fig. 9.18**

9) Click on to OK you will get the menu as shown :

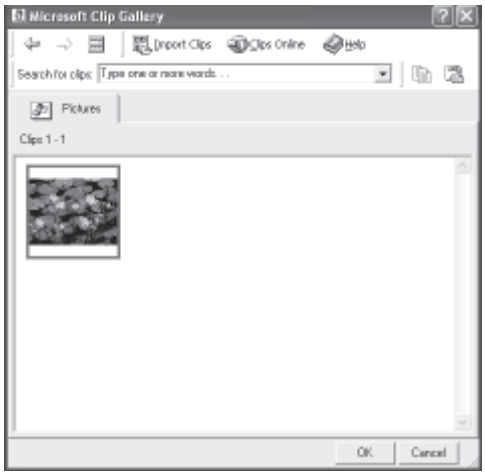



**Fig. 9.19**

10) Click on OK you will get the picture inserted in the box of the slide.

**Save the PowerPoint presentation :** We can save the files in different ways which are discussed in other applications like MS Word, MS Excel etc. The procedure is same. Even performing the tasks live opening of an existing presentation, or closing a presentation without saving it, is also similar to the process carried out in other applications, So, you can follow the same procedure:

**Note :** The default extension used for the PowerPoint presentation file is ppt.

## 9.5 TO INCLUDE CHART IN THE SLIDE

To include a chart in the slide follow the steps given below :

1) Follow the steps to insert a new slide as explained earlier and select the chart layout as shown in **Fig. 9.20** and click OK.




**Fig. 9.20**

2) Add title to the slide. For example Admission chart.
3) Double click at the chart area, you will get default chart. To have your data you can edit the data sheet according to your needs.
4) You can change the type of the plot, style etc. Right click on to the chart area and edit it.

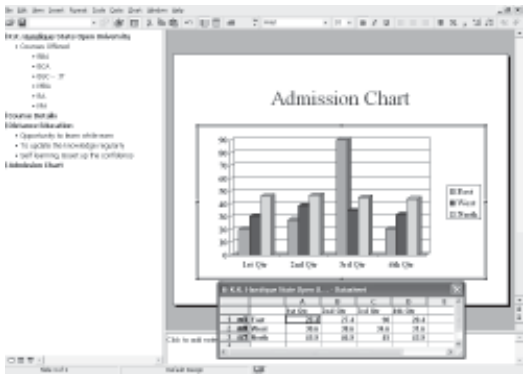



**Fig. 9.21**

## 9.6 TO IMPORT A DATASHEET

You can import a data sheet from a file for example from Excel. To do so follow the steps given below :

1) Double click at the chart area. You will get default chart. Click on to the Import file icon present on the standard tool bar and select the data sheetm which you want to import, according to which you want to draw the chart.
2) You can change the type of the plot, style etc. To do som right click on to the chart area and edit it.

Microsoft PowerPoint

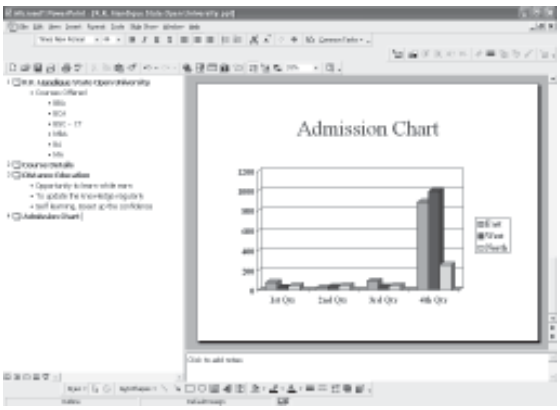



**Fig. 9.22**

## 9.7 FORMATTING OPTIONS

**Font Style :** Font style of the text can be changed by selecting the text of which you want to change the font style and clicking on to the required font style icon available on the formatting tool bar.Similarly Font and their size can be changed. Select the text and use the required icons respectively.

**Aligning Text :** After selecting the text, use required icons depending on whether you want to Align the text Left, Centre or Right respectively. To have Numbers or Bullets use the following icons respectively.

**Background of the Slides :** The background of the slide can be changed according to our needs to give an attractive look to the slide. Follow the steps given below to change the Background of the slide.

1) Click on to Format option on the menu Bar. From the drop down menu click on the Background option. You will get a menu shown in **Fig. 9.23**.

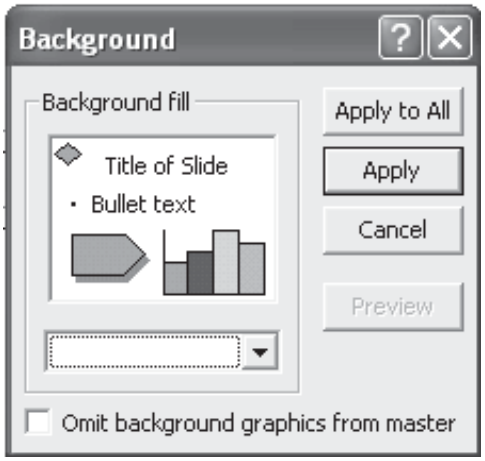



**Fig. 9.23**

2) To select the required Background click on the arrow mark as shown above. You will get different colour on the resulting menu as shown in **Fig. 9.24**, select the required color for the Background. For example assume that you have selected grey colors as Background color then you will get the color applied to the sample slide in the menu as shown in **Fig. 9.25**.

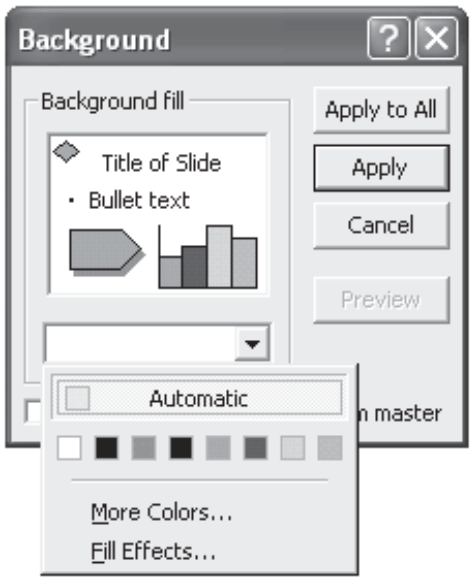



**Fig. 9.24**

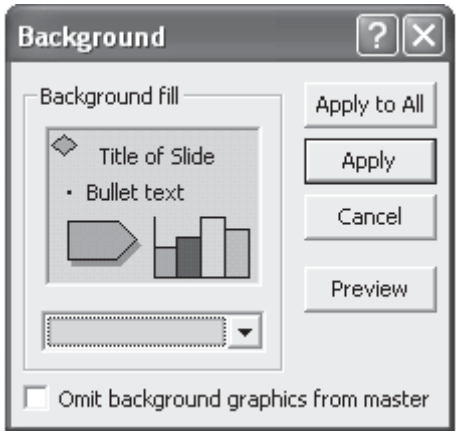



**Fig. 9.25**

3) You can apply this Background color to all the slides in the presentation by selecting. Apply to All option or you can select Apply option to apply the Background color only to the current slide in the presentation. Or you can cancel this menu by clicking on the Cancel option. You can click on to Preview option to see the new background color on the slide without actually applying it to the slide and if you did not like it you can select a different Backgound color.

**Note :** All options discussed above are available in Menu shown in **Fig. 9.23**.

**Fig. 9.26** shows the application of the Background color to one slide.

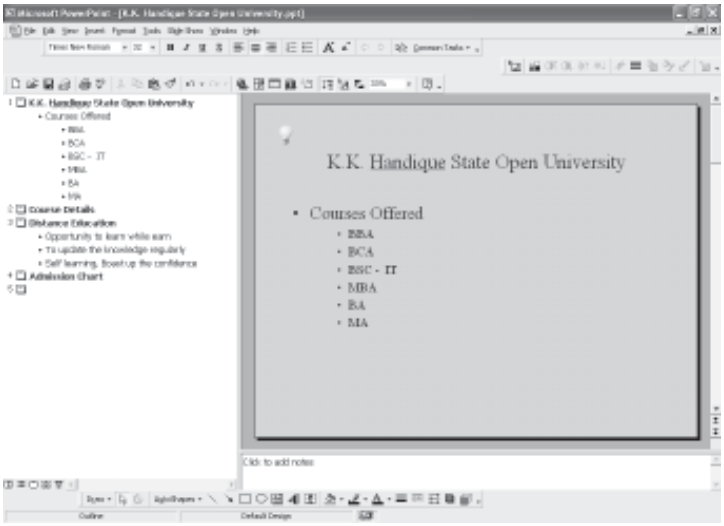



**Fig. 9.26**

**More Color :** If you are not satisfied with the available colors, then you can click on to More colors option. This option is available in menu shown in **Fig. 9.24**. You will get a menu as shown in **Fig. 9.27**.

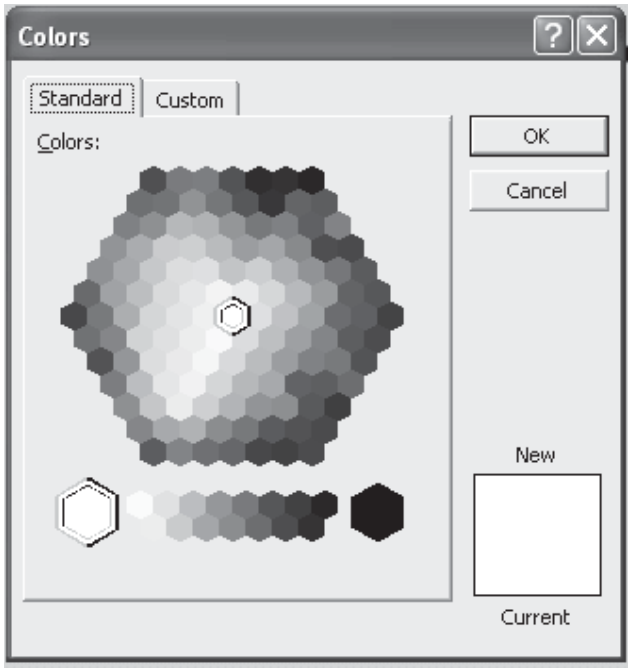



**Fig. 9.27**

Now select the required color by clicking on your required color, you will get the display of your selected color in the box titled “New” at the right button corner of the menu as shown in **Fig. 9.29**. Now click OK. You will get the color applied on sample slide as shown in **Fig. 9.30** and now you can apply this color to all the slides or current clide.




**Fig. 9.28**

**Fill Effects :** You have different kinds of Background color fill effects. Follow the steps given below.

1) After selecting the required colors click on the arrow as shown in **Fig. 9.29**. In the resulting menu select Fill Effects as shown in **Fig. 9.30**. You will get a menu as shown in **Fig. 9.30**.

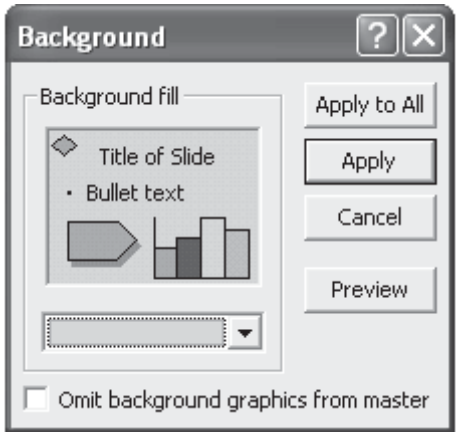



**Fig. 9.29**

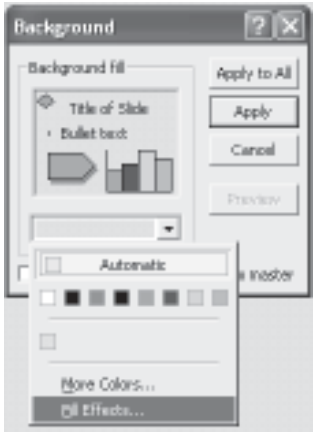



**Fig. 9.30**

2) You can use Gradient according to your **Fig. 9.31**.




**Fig. 9.31**

3) You can select the texture **Fig. 9.32**.




**Fig. 9.32**

4) You can select Pattern **Fig. 9.33**.

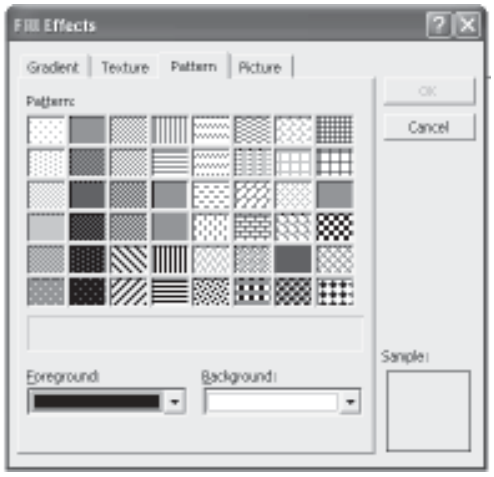



**Fig. 9.33**

5) You select pictures **Fig. 9.34**.

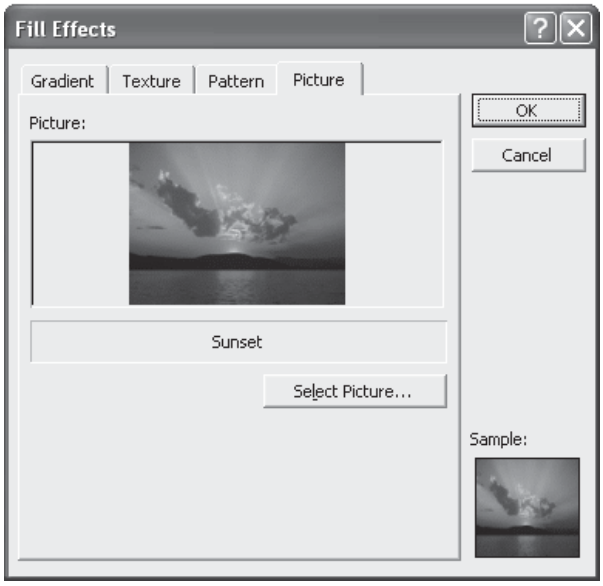



**Fig. 9.34**

**Note :** Try all the options.

**Applying Design Templates:** You can apply different design templates to the slides to improve the appearance of the slides. To do so, follow the steps given below.

1) Click on to Format option present in the menu Bar you will get the screen as shown in **Fig. 9.35**.

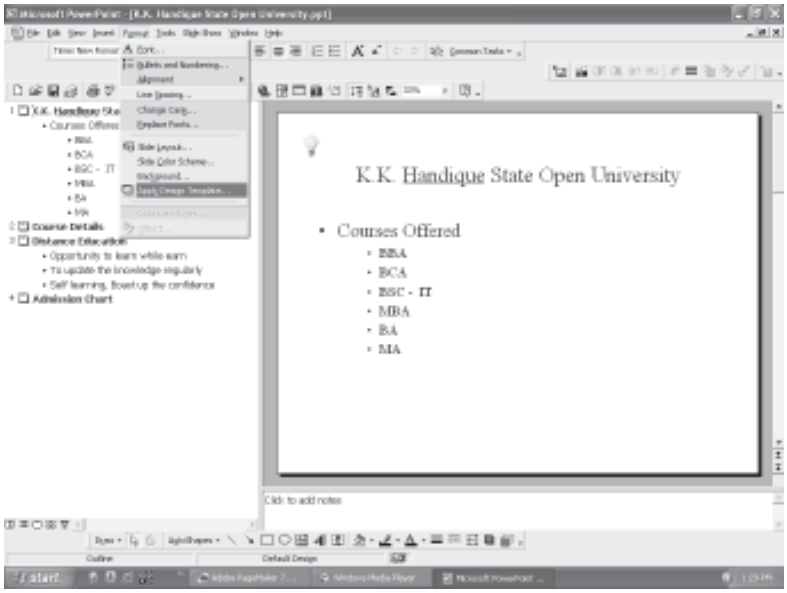



**Fig. 9.35**

2) Click on Apply Design Templete option of the drop down menu. You will get another menu as shown in **Fig. 9.36**.

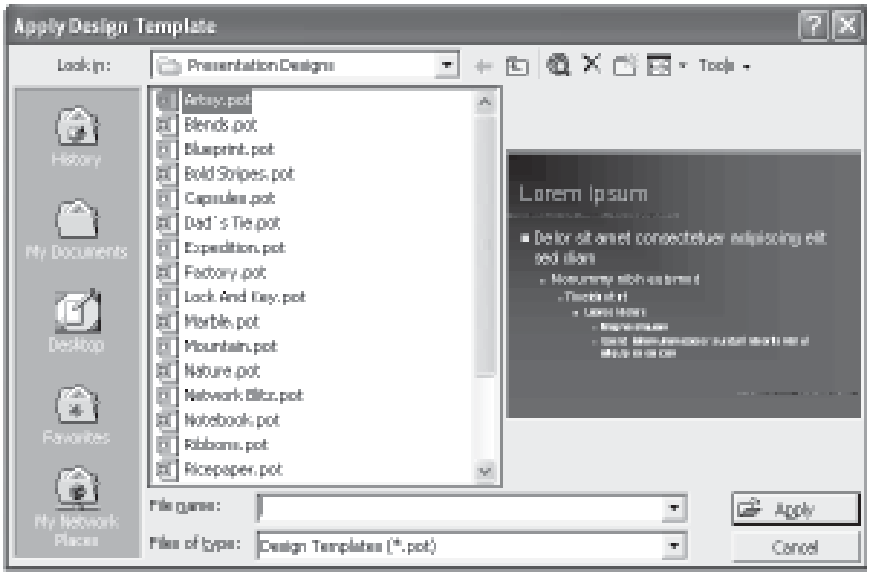



**Fig. 9.36**

3) You can select any of the templates available in the list by clicking on it and clicking on the Apply Option in that menu. The template will be applied on the slides of the presentation. You can also cannot this menu by clicking Cancel option present.

**Note :** Right side box present in the Apply Design Template menu [Fig.9.36] will display the application of the selected design Template on the sample side; so by looking at that you can choose the correct template.

**Example :** Let us select Fill Bar design Template **Fig. 9.37** and apply it to the slides **Fig. 9.38**.

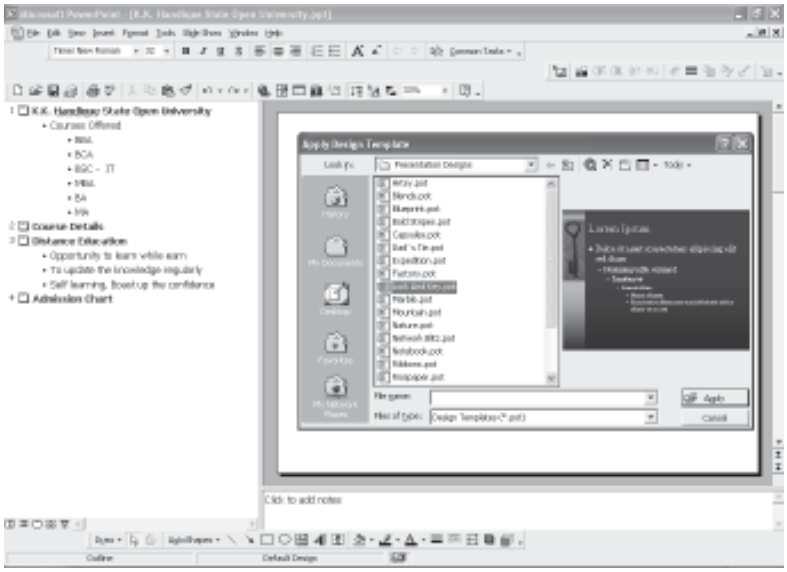


**Fig. 9.37**

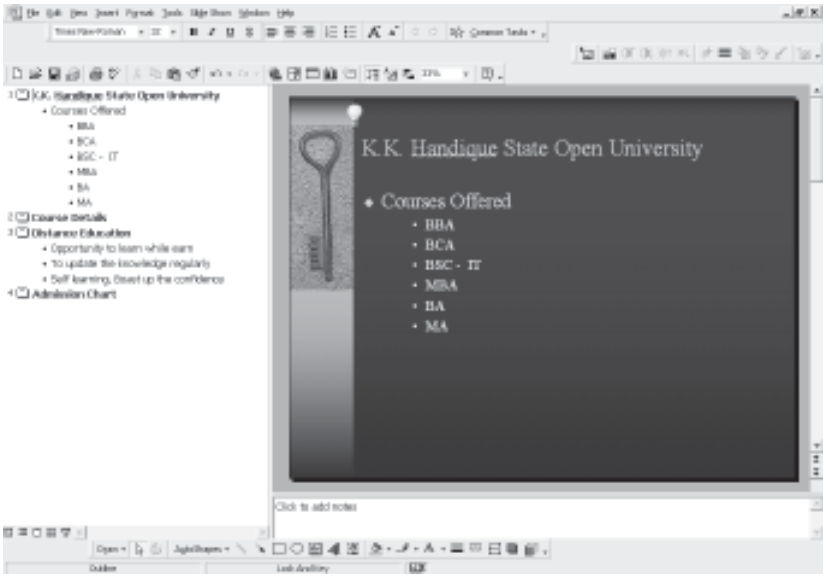



**Fig. 9.38**

## 9.8 SLIDE TRANSITION

During the slide show if you want to give different kinds of transition to the slides follow the steps given below.

1) Click on to Slide show option present on the Menu Bar you will get a drop down menu as shown in **Fig. 9.39**.

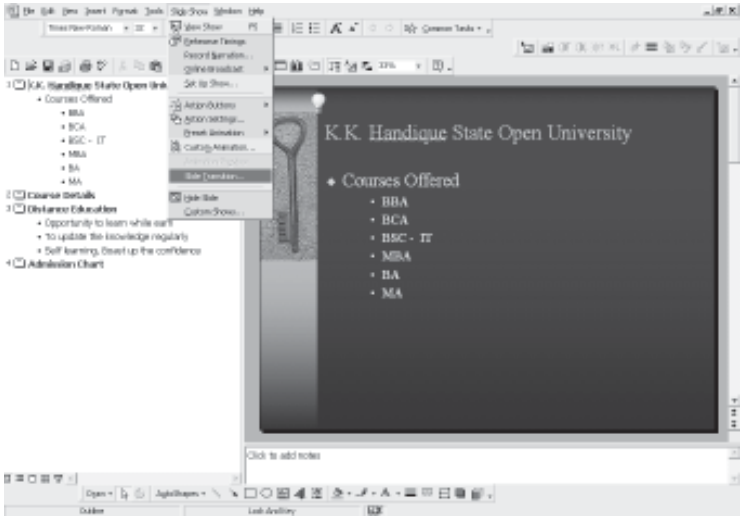



**Fig. 9.39**

2) Click on to Slide Transition option you will get a menu as shown in **Fig. 9.40**. This menu has different options let us see each of these options.

**a) Effect :** By default it is No Transition. You can select different kinds of effects for transition by clicking on the arrow as shown in Fig.9.40and clicking on the required effect. The effect of your selection is shown in the box of the menu immediately. (**Fig. 9.40**). The effect can be made slow, Medium or Fast.

**b) Advances :** This is used to move from one slide to another slide in a presentation during slide show. You can select the option on mouse click or Automatically after. You can select both the options also (**Fig. 9.40**).

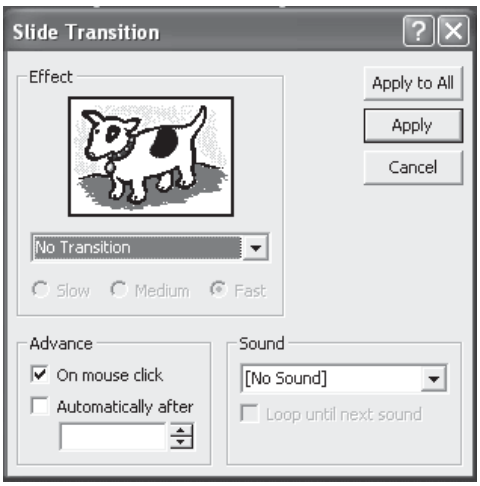



**Fig. 9.40**

**On Mouse Click :** When you select this option you are required click the mouse button to advance to the next slide.

**Automatically after :** When you select this option after certain amount of time as you have selected, the next slide will be displayed on the screen.

When you select both the options, the slide will be advanced either by mouse click or automatically whichever is first.

**c) Sound :** You can select different kinds of sounds during the appearance of the slide to do so click at the sound option of Slide Transition menu and select the required type of sound (**Fig. 9.40**).

**Note :** Now you can apply this Slide Transition feature to all the slides (Apply to All) of the presentation or the current slide (Apply).

You can also Cancel the menu (Cancel) **Fig. 9.40**.

## 9.9 DIFFERENT VIEWS OF THE PRESENTATION

You can have the different views of your presentation.

1) **Normal View :** Click on this you will get normal view.

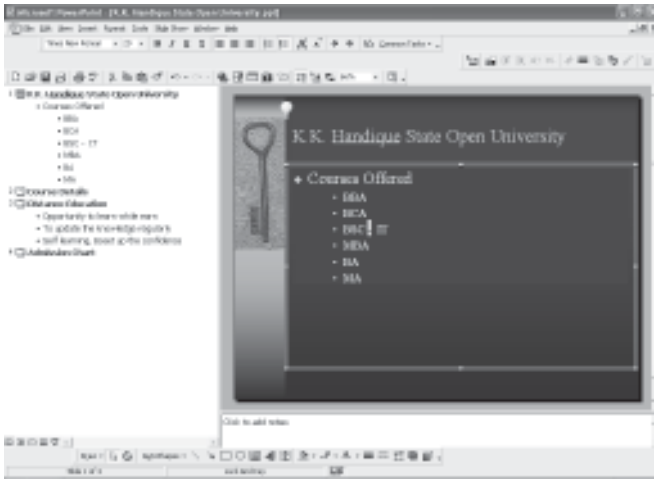



**Fig. 9.41**

2) **Outline View :** Click on this to get outline view as shown in **Fig. 9.42**.

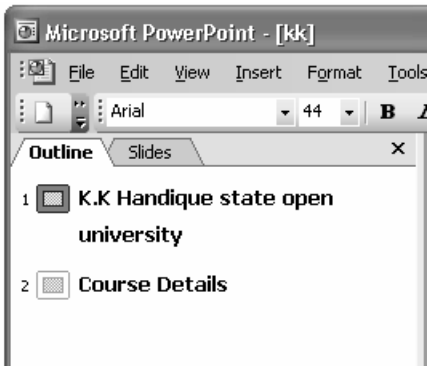



**Fig. 9.42**

3) **Slide View :** Click on this to get a view as shown in **Fig. 9.43**.

**Fig. 9.43**

**4) Slide Sorter View :** Click on this to get the view as shown in **Fig. 9.44**.



**Fig. 9.44**

**5) Slide show :** This takes you to slide show.



### CHECK YOUR PROGRESS

**Q.1 :** Write true or false for the following statements :

i) You can create a new presentation by Autocontent Wizard.

ii) You can apply sound affect while presenting the slides.

iii) We cannot insert graphics in Microsoft PowerPoint.

**Q.2 :** Define Microsoft PowerPoint.

.....

.....

.....

.....



## 9.10 LET US SUM UP

PowerPoint provides 24 different types of page layouts along with a blank page. A PowerPoint presentation can include one or more slides. You can even add more slides to the existing presentation. The default extension used for the PowerPoint presentation file is ppt. A chart can be included in a slide. A Data Sheet can also be imported from a file say from Excel. The appearance of the text in the slides can be changed to suit the requirement.

Attractive books can be given to slides by changing the Background. You can also have the required kind of transitions for the slides in the PowerPoint presentations.



## 9.11 FURTHER READING


1) Jain, V.; *MS Excel 2002–Training Guide*, BPB Publication, New Delhi.
2) Lotia, M.; *World 2000–An Introduction*, BPB Publication, New Delhi.
3) Rajaraman, V. (2004); *Fundamentals of Computers*, 4th Edition, Pentice-Hall of India, New Delhi.
4) Syganski; *Introduction to Information Technology*, Pearson Education, Delhi-110092.
5) Witherspoon; *PowerPoint 2000 Fast & Easy*, BPB Publication, New Delhi.




## 9.12 ANSWER TO CHECK YOUR PROGRESS

**Ans. to Q. No. 1 :** i) true, ii) true, iii) false

**Ans. to Q. No. 2 :** Microsoft PowerPoint is a most widely used utility to create presentation relating to products, organisation, research papers etc. Using this software a slide can be designed, text can be inserted, graphics can be inserted and animation can be given to the slides and the objects within the slide.



## 9.13 MODEL QUESTIONS

**Q.1 :** Explain different basic parts of PowerPoint Window.

**Q.2 :** What are PowerPoint presentation? Why they are used?

**Q.3 :** Explain the steps in creating a PowerPoint presentation.

**Q.4 :** How do you import a Data Sheet from Excel?

**Q.5 :** Discuss slide transition.

**Q.6 :** What are the different views of presentation?

*** ***** ***

# UNIT 10 : INFORMATION TECHNOLOGY

## UNIT STRUCTURE


10.1 Learning Objectives

10.2 Introduction

10.3 Areas of Information Technology

10.4 Advantages and Disadvantages of Information Technology

10.5 Application of Information Technology

10.6 Let Us Sum Up

10.7 Further Reading

10.8 Answer to Check Your Progress

10.9 Model Questions


## 10.1 LEARNING OBJECTIVES

After going through this unit, you will be able to :

- define Areas of Information Technology
- explain Applications of Information Technology
- explain Advantages and disadvantages of Information Technology.

## 10.2 INTRODUCTION

Information Technology (IT) may be defined as the technology which is used to acquire, store, organize and process data to a form which can be used in specified applications, and disseminate the processed data. Information is processed data or processing of data, based on which decisions can be taken and appropriate actions initiated.

Information is also processed data which improved our knowledge, enabling us to do our work better. As an example of how organizing data enhances our understanding, let us consider marks obtained by students in an examination. The marks by themselves do not give any immediate idea about the performance of the class. By processing this data, a bar chart may be obtained, which gives the number of students with marks between 100 and 90, 90 and 80, 80 and 70, an so on. This Chart (**Fig. 10.1**)

gives the teacher of the class information on the performance of the class, which would enable him or her to initiate appropriate action.

**Fig. 10.1**

This is a simple example to have a basic idea and concept of information technology. Actually data is processed through computer based systems for various applications.

## 10.3 AREAS OF INFORMATION TECHNOLOGY

There are various areas of information technology. These areas could be broadly classified as :

1) **Hardware Engineering :** It is a science related to electronic circuits and components. The hardware of the computer consists of different types of units such as memory devices, CPU, input and output devices. Memory devices are the devices based on electronic circuits and components to store the instructions and data required for operation.

   Memory is needed for the following purposes :

   i) To store the program and data during execution.
   ii) To store the program for repetitive use.
   iii) To store the data for the future.
   iv) To store the result of execution.

   Semi-conductor memory and magnetic disk memory are two-types of memory we use.

- **CPU (Central Processing Unit) :** The Control Unit, Arithmetic Logic Unit and Memory Unit together form the Central Processing Unit (CPU) of the computer.
- **Input Devices :** These devices allow supply of data to the computers. The data can be fed in the form text or graphics. Keyboard, light pen and mouse are the examples of input devices.The input devices help us to communicate with the electronic computer by converting the human understandable signals and numbers into appropriate electric signals.
- **Output Devices :** These devices provide output result which are processed by the user. Visual Display Unit (VDU), Printer and Plotter are the examples of output devices.

The output devices help the computer to communicate with us by converting the electric signals to human understandable signals.

**2) Networking :** It is a science related to Internet and interconnected network of computers. A network is a communication system that enables computer users to share computer equipment, application software, data voice and video transmissions. Networks can link users who are across the room or across the world. Network information is transmitted by wire or through radio waves, such as microwaves. There are two primary reasons for having a network.

**First :** By sharing software and equipment, network owners are able to save expenses on resources. One printer can be used for an entire office, saving the cost of attaching a printer to each computer.

**Second :** Networks make people more productive. People are able to share information without leaving their offices or homes.

- **Networking Elements :** Today's networks have several common elements:
  - **i) Nodes :** Any device or entity or computer connected to a network is a node.
  - **ii) Cabling :** The communication wire used to connect equipment in a network is called a cable. The cable provides

a medium for the electrical signal that carries information from one networked computer to another. The signal contains data that are used by workstations, hosts and printers. Most nodes (or computers) have a network interface card (NIC) that can capture the signal and translates it for use by the node.

iii) **Topology :** All networks have a physical layout that determines how the data signal goes from one node to the next. The physical layout is the topology of the network. The topology is most easily represented by drawing the connections between network nodes.Nodes connected in star patterns are known as the Star Topology, in circles known as the Ring Topology, and in a straight line pattern is known as the Bus Topology.

3) **MIS (Management Information System) :** It is a tool used by management for improving the productivities. A system is a set of processes interacting with each other in response to inputs to produce outputs. A process is a set of operations carried on inputs with the system. Management Information System (MIS) is an application of management of the information of a system. The processing of data is carried out by various persons trained in the organization. The processing of data is performed by using computer which utilizes hardware and software components. The principle of management is utilized for operation on a data system. This may involve:

i) Planning of data processing.
ii) Planning of software and hardware.
iii) Planning for new software.
iv) Planning for advanced hardware.
v) Coordinating the personnel.
vi) Organizing and arranging day-to-day operation.
vii) Communicating with programmers and data entry operators.
viii) Motivating the personnel for better accuracy and efficiency.

ix) Initiating the personnel for learning new system and crating there interest.

x) Establishing the control over the complete system to avoid unnecessary expenditure, work, waste of time etc.

The MIS cell performs some of the major functions :

i) Monitoring of useful information.

ii) Designing of better procedure.

iii) To assist in decision making.

iv) To form an interface between different systems.

**4) Internet and Software :** It is the area in which the sharing of resources and communication can be performed. We consider three types of network:

**i) Local Area Network (LAN) :** A series of interconnected computers, printers and other computer equipments that share hardware and software resources. The service area is usually limited to a given floor, office area, or building.

**ii) Metropolital Area Network (MAN) :** A network that reaches throughout a large area such as a city or a large university campus.

**iii) Wide Area Network (WAN) :** A far reaching system of networks. WANs can across state lines and across continents. They make it possible for thousands of users to send data to one another.

We may define Internet as a worldwide Computer networks whose constituents are computer networks such as LAN, MAN and WAN located in organizations. All these individual networks are interconnected using routers and publish switched telephone networks. All computers connected to the Internet communicate with one another using a common set of rules. The common set of rules is called a protocol. TCP/IP (Transmission Control Protocol/ Internet Protocol) is the protocol used by the Internet.

An important point to note use any technology such as Ethernet, token ring or any type of connection such as ring, bus, star etc. provided the rules of communications among computers is standardized as TCP/IP.

The Network Interface Unit (NIU) of every computer/device which wants to send or receive messages must have an address. Such an address is called an IP address. It should be noted that routers which interconnect local networks are special purpose computers and will require IP addresses. The IP address is 4 bytes long. It is difficult for people to remember a string of 32 bits. Thus IP address is expressed in the so called dotted decimal format.

For example, an IP address is : 144.16.79.48

Where each number is the decimal equivalent of a byte (Remember that with 8 bits we can represent 0 to 255). Fortunately, in day-to-day use, it is not necessary to remember the IP address of your machine in numerical form. A character string which is easy to remember is usually assigned as your address. The actual assignment of IP addresses follows a systematic process to make it easy to route messages between networks. Each Internet Service Provider (ISP) who manages a group of users is assigned a set of IP addresses by an international agency. The ISP in-turns assigns a subset of addresses to each organization from this set.

The heart of any network is the communication software used to guide data along their way. All networks use or more software protocols that enable data packaging and transmission. Protocols define the rules for handling and interpreting transmitted data. Each data packet is constructed according to the rules of the network protocol. For example, many college campuses use the Transmission Control Protocol/Internet Protocol (TCP/IP) to transmit data. Novell Netware networks use the Internet Packet Exchange (IPX) and the Sequence Packet Exchange (SPX) protocols. These protocols can be transmitted on a single network as long as workstations can recognize the protocols.

The speed at which data are transported on a network is called Data transmission on a network is called Data transmission rate. On some networks the speed may be as low as one megabits per second (Mbps), and others it may be over 100 Mbps.

5) **Enterprise Resource Planning (ERP) :** It is the area in which the planning of available resources and forecast the demand of the customer is performed by use of computer system. ERP is also known as Enterprise Systems which appear to be dream come true. These commercial software packages promise the seamless integration of all the information flowing through a company, financial and accounting information, supply chain information, customer informati0on.

   An enterprise system enable a company to integrate the data used throughout its entire organization. This list shows some of the many functions supported by SPA' R/3 package. Germany's SAP is the fastest software company in the world.

   At the heart of an enterprise system is a central database that draws data from and feeds data into a series of applications supporting diverse company functions.

6) **GUI Applications :** There are front end tools used for customization of software. Graphical User Interfaces or GUIs are found on most of today's microcomputers. GUIs are based on the philosophy that people can use computers intuitively – that is with minimal training – if they can manipulate on screen objects that represents tasks or commands.

   GUI is a work environment, ranks etc., provided by software like windows, Presenting picture and graphics to operate various commands.

   Graphical objects are the key elements of GUIs. A graphical object is a small picture on the screen that you can manipulate using a mouse or other input device. Each graphical object represents a computer task, command or a rat world object. You show the computer what you want it to do by manipulating an object instead of entering commands or selecting menu options.

   Most graphical user interface are based on a metaphor in which computer components are represented by real-world objects. For example, a user interface using a desktop metaphor might represent documents as file folders and storage as a filing cabinet.

The greatest advance is provision of very good graphical user interface, which makes it easy for any one to use the system for information.

7) **Database Application :** There are the database related applications software.

*Data :* Data is defined as facts related to people, places, events or things, which can be represented using number and letter.

Example : Name, address, age or facts related to people. These facts are represented using alphabets, numbers or a mix of both.

*Database* : A collection of interrelated data stoned together with controlled redundancy to serve one or more applications, so that the data stored are independent of the programs that use them and so that a common, controlled approach can be used for adding, modifying and retrieving data.

It is a form of data construction created to store the data in a suitable format. The database provides an information about the type of application or th case for which the data is stored.

Example : Address File

| Name | Age | Address | Occupation |
|---|---|---|---|
| | | | |

*Database System* : A database system is an integrated collection of related files along with details of the interpretation of the data contained therein.

*Database Management System* (DBMS) is a software or a software system – a collection of software required for using a database.

Example : MS-ACCESS, FOXPRO, ORACLE etc. Two main types of facilities are supported by the DBMS :

i) **The Data Definition Facility or Data Definition Language (DDL) :** DDL can be used to define the conceptual scheme and also give some details about hoe to implement this scheme in the physical devices used to store the data.

ii) **The Data Manipulation Facility or Data Manipulation Language (DML) :** DML is a language used to manipulate data in the database. Data manipulation involves retrieval of data from the database, insertion of new data into the database and deletion or modification of existing data.

8) **Operating Systems :** This is a science of study of operational system of computer.

A Operating System is the software that controls the computer's use of its hardware resources such as memory and disk storage space. An operating system works like an air traffic controller to coordinate the activities within the computer. Just as an airport cannot function without air traffic controllers, a computer cannot function with an operating system.

The operating system also works as a liaison between the computer hardware and application software. An operating system helps you start an application, then it works "behind the scenes" while an application software is running to perform tasks essential to the efficient functioning of the computer system.

The names of the most popular microcomputer operating systems are FOS (Disk Operating System), Microsoft Windows, OS/2 and Mac OS, UNIX, VMS and MVS, LINUX are the familiar names of the operating systems used in mini or mainframe computers. Operating systems for micro, mini and mainframe computers perform many similar tasks.

9) **Computer Aided Design :** It is the design of the product by use of the computer software. There are several readymade tools available in computer systems to generate pictures. We will classify the pictures as geometrical objects which can be drawn using line segments, circles, curves, edipses, triangles etc. and as natural objects such as an elephant, and human face. Geometrical objects are easy to generate using the primitive operations available on a PC. Generating figures using line segments, circles etc. is known as vector graphics, vector graphics programs are used extensively

to create engineering design drawings, generally called Computer Aided Design (CAD) tools. One of the most popular CAD tools is called AUTOCAD which allows viewing different aspects of an object such as top view, side view, frontal view, and a 3D perspective. The major advantages of tools such as AUTOCAD are:

i) Precise drawings to scale and control of colour.
ii) Blending colous and shading
iii) Ability to slowly rotate a 3D object view on the screen and make alterations as needed.

**10) E-Commerce :** It is the commercial activity performed by use of electronic media. The virtual world of business is E-Commerce. The Internet has inter-connected number of users creating a new world markets and new business opportunities.

E-Commerce is a commercial activity by using electronic media by executing business transaction such as contract ordering, invoicing payment on interactive electronic media. This refers to all types of transactions relating to commercial activities based on processing and transmission of digitized data, text, sound and images.

It is defined as any transfer involving some exchange of value over an Internet. The E-Commerce involves a user with a computer linked to the Internet which employs an Internet browser to contact web sites in order to exchange the value for goods or services or transfer of funds between accounts. The goods exchanged may be electronic documents, images and sound files. The electronic services may include ATM, Financial Planning, Online Games etc.

The E-Commerce is used in number of fields such as –

i) Sharing of information
ii) Document exchange
iii) Messages dispatch
iv) Market and advertising
v) Payment transaction

It is used in wide areas of business and commercial applications. Some of the applications are :

a) **Web Site Development :** The website can be created for any business organization which contains the information of the organization, the products manufactured and the location, capacity etc. of the company. The website contains number of files having photograph and picture of the company products. It also provides information about the communications to be done with different departments.

b) **Online Training :** It is possible to provide training to the students by using the Internet and video conferencing system. The training can be given in various areas of engineering, science, medical etc.

c) **Shopping :** It is used for purpose of shopping where the products could be displayed and the information regarding the product can be provided. The orders could be accepted.

d) **Real Estate :** The e-commerce for real estate business is for display and choice of various properties and their locations.

e) **Customer Services :** It can be used for providing various services to the customers like the information about trains, buses, hotels etc. The e-mail service can also be provided.

f) **Medical Consultations :** It can be used for consultation of the expert doctor regarding the diagnosis.

g) **Online Library :** It can be used for the library in which online books could be provided and e-books could be obtained on the Internet.

h) **Online Banking :** It can be used for online banking services where the transactions of payment could be made on the Internet through the credit cards system.

The E-Commerce applications are :

1) **Business to business E-Commerce :** The Intranet can connect all businesses to one another regardless of their locations or positions the supply chain of Internet connections.

2) **Business to consumer E-Commerce :** The connection of business houses or companies to consumer for display of their advertisement and marketing of their products.

3) **Intra Company E-Commerce :** The new tools of E-Commerce such as TCP/IP connectivity and WEB browser have finally enable the building and sharing of information within the company. The intra company applications of WEB based technology are called intranets

11) **Webpage Development :** This is a development of customize marketing documents placed on the Internet site for the view of the customers. The Word Wide Web (WWW, W3 or the Web for Short) is the most visual part of the Internet. It is also the fastest growing part of the Internet which may be because it is so easy to access and explore. It is based on the display of Web pages, which are computer documents that can present text, graphics and sounds.

A Web page represents a single location on the Web. A Web site is made up of two or more interconnected Web pages presented as a unified place on the Web. A common term used on the Web is home page. This is the intended central or starting place on a Web site.

In 1989 Tim Banners Lee and his team in the European Laboratory for Particle Physics designed the present form of the documentation language and called it Hypertext Markup Language (HTML for short) which is a basic tool for designing Web page. It is a documentation language to mark the headings, title, table and forms.

The Web is visual, allowing you to see more than just text on year computer screen. For example, with the Web you can preview a piece of art and then download it, copying it to your computer.

You can still view written information as well, but text can be formatted in different ways to fit the overall presentation of the Web page.

The Web is an ideal medium for the transmission of multi-media information. With the click of a button you can download clip from your favorite movie or hear a snippet (to remove by cutting off) of audio from a famous radio address.

The Web's highly graphical nature makes it ideal for presenting artwork and photographic images. Pictures of family, friends and especially pets have become increasingly popular among Web creators.

Web pages also serve as an ideal medium for transferring computer software. Many corporate Web sites, for example, allow users to download free demonstration programs, add-on pieces, or upgrades to existing computer applications.

HTML and hyperlinks are the basis of web's versatility. Links on a web page can take the viewer to another place on the same web page or to different web page altogether. They can be links to images, or they can activate the transfer of digitized information such as video or audio clips. (Web links are also commonly known as hyperlinked) Hyperlinks can call up windows for sending e-mail, or even take the views to locations on the internet outside the web.

Hyperlinks are the easiest way to access information on the Internet. Hyperlinks are based on the principles of hypertext, which is a method of publishing that relies on interactive participation.

When a web page is developed the following are to be planned :

i) Content of the Page

ii) Appearance of the Page

The appearance of the web page is coded in HTML language using HTML tags.

**12) Application Developers :** This is an area of software development of the commercial applications, business and engineering application. This is an area of application software. Application software helps you accomplish a specific task using the computer. It helps you produce documents, perform calculation, manage financial resources, create graphics, compose music, play games, maintain files of information, and so on.

Because there is such a vast amount of application software developed so far, it is helpful to classify it. One way to classify application software is to use these categories : Productivity, business, education, reference and entertainment.

Productivity software can be classified as follows :

a) ***Electronic Mail Software :*** provides you with a computerized mail box that collect documents or "mail" you receive electronically from other computer users. You can send electronic mail messages, you can read your electronic mail on your computer screen, you can save or throw away your electronic mail after you read it, and you can compose electronic replies to the mail you receive.

b) ***Graphical Software*** helps you draw pictures, 3-D images, and animations

c) ***Desktop Publishing Software*** provides you with computerized tools for page layout and design that combine text and graphics.

d) ***Scheduling Software*** helps you keep tracks of appointment, due date, and special dates such as birthdays and holidays.

e) ***Word Processing Software*** helps you produce documents such as reports, letters, papers, and manuscripts.

f) ***Spreadsheet software*** is frequently used by financial analysis to examine investment opportunities, by managers to create budgets, by entrepreneurs to create business plans, and even by educators to keep track of student grades. It helps you work with numbers.

g) ***Database Management Software*** helps you work with facts and figures, particularly stored in database.

h) ***Business Software*** helps business and organizations efficiently accomplish routine tasks.

i) ***Entertainment software*** transforms your computer from productivity and business to fun and games.

j) Education Software is designed to help you learn more about a particular topic.

k) ***Reference Software***, such as an electronic encyclopedia, helps you look up facts on any topic.

l) ***Educational simulations*** let you work with a computerized model of something in the real world, manipulate it, and see what happens.

**13) Multimedia System :** These are the recreational systems used for entertainment, games, fun etc.Multimedia system is defined as an integrated collection of computer-based text, graphics, sound, animation, photo images, and video. It also refers to the integrated use of multiple media, such as slides, video tapes, audio tapes, records, CD-ROMs and Photos.

Computer technology is replacing or controlling many of the technologies and media that were previously used for multimedia presentations. Advances in computer technology have made it possible to combine text, photo images, speech, music animated sequences, and vid4eo into a single interactive computer presentation. To display realistic graphic and video, you computer system must have a high-resolution monitor and a CD-Rom drive.

## 10.4 ADVANTAGES AND DISADVANTAGES OF INFORMATION TECHNOLOGY

The information technology is the technology used for processing of information on the computer system. The use of computer system provides a large number of advantages for processing information.

**Advantages :**

a) The data can be stored permanently
b) Large number of calculation can be performed at very fast processing speed.
c) The degree of accuracy is very high
d) The operations like deletion of data, modification of data can be done very easily.
e) The operations of retrieval of data can be performed and the data can be searched immediately from the stored data.
f) The operations such as indexing or arranging the data is possible
g) The variety of functions can be utilized in the operations.
h) It allows for the decisions and logical comparisons.
i) It allows for creation of standard libraries.
j) It is possible to obtain the results in the formatted form.

k) It allows for production of graphics and aesthetics (the study of the nature of beauty).

The information technology revolution has occurred because of the above advances which are obtained in processing of data.

**Disadvantages :** The following are the important disadvantages:

1) ***Cost of software/hardware and migration*** **:** A significant disadvantage of information technology/system is cost. In addition to the cost of purchasing and/or developing the software, the hardware has to be upgraded to allow for the extensive programs and the workspaces required for their execution and storage.

   An additional cost is that of migration from a traditionally separate application environment to an integrated one.

2) ***Problems associated with centralizatio*****n:** Centralization also means that the data is accessible form a single source, namely the database. This increases the potential severity of security breaches and disruption of operation of the organization because of downtimes and failure. The replacement of monolithic centralized database by a federation of independent and cooperating distributed database resolves some of the problems resulting from failures and downtimes.

3) ***Complexity of backup and recovery*** **:** While centralization reduces duplication, the lack of duplication requires that the database be adequately backup so that in the case of failure the data can be recovered. Backup and recovery operations are fairly complex in the information system management.

## 10.5 APPLICATION OF INFORMATION TECHNOLOGY

The Information Technology can be utilized in a large number of fields such as:

1) **Railway Reservation System :** In this system the reservation records of the passengers are maintained for different trains and classes. The reservation system maintains the records of passenger name, age, destination etc. in database files.

2) **Industries and Commerce :** The profitability being the prime motto, industries and commercial houses have exploited the use of computers to a large extent to achieve the aim. The versatility of the computers to handle a wide variety of situations, calculations and decision making capacity has been proved as a boon to the commercial world. The tremendous speed and accuracy which could be depended upon have been put to use effectively. The voluminous, tedious and repetitive arithmetic figures and operations involved in the commercial transactions were invariably source of monotony and fatigue for man.

   The errors were common, therefore rechecking meant more time and effort and loss of profit. Since the computers have been loaded with these responsibilities the efficiency has increased beyond imagination.

3) **Banks :** The Information Technology is used in the bank for maintaining the accounts of the saving and current accounts. These records are maintained in the files and the calculations of transactions can be done very easily. These are used for clearing of cheques and even counting of cash.

4) **Inventory Control :** Inventory Control is control of store records. The aim being to avoid the dead inventory, it would be highly desirable to have an all-time up-to-date information about the position of the stock of raw materials, finished, goods and semi-finished goods. The daily receipt of stocks have to be added to the books. The issue of raw materials for processing deducted from the stock and the stock at the end of the day is known to plan the future procurement. This involves tedious calculations and repetitive operation leading to monotony or errors. The use of computers for this purpose has been highly accepted by industries in general. The inventory costs have in fact been reduced considerably. By an up-to-date maintenance of inventory and purchases the industrial operations are stream lined for the higher efficiency.

5) **Production Planning and Control :** The computers have been the best aids to planning the production schedules. The client wise

demand of the goods, production wise manufacturing requirements, item wise actual production, capacity wise manufacturing planning, various such combinations for planning the production control of and industry can be possible only if the computers come to rescue.

6) **Costing and Budgetary Control :** To achieve the goal of profit making in an industry, the control over manufacturing cost becomes an effective remedy. The industries having a series of manufacturing process, the product costing world involves a number of calculations and a range of decision makings. The computers can take up this job and provide the necessary costing figures to control the manufacturing costs. The budget of an industry world involve a number of factors like market behaviour, product demands, financial resources, man power costing and the management policies. The computers can provide useful database for an efficient budgetary control.

7) **Sales Analysis and Market Research :** The efficient marketing management of an industry can be supported by the information available by the computer in a variety of classification and combinations like data wise, item wise, party wise, product wise, territory wise and salesman wise sale figures. The computer can also prepare product invoices if required. This type of analysis can certainly become a strong base for marketing managers.

8) **Financial Accounting and Pay Roll :** The computers have become the most efficient tool in financial accounting and auditing. The entire book keeping is made through the computers. The preparation of tax balances, profits and loss statements, financial balance sheet which used to take months for the account department, involving number of commerce figures and the scope for many other supporting information.

9) **Social and Educational Fields :** Along with the sale of computer in industries, it has entered the social and educational field of the society. The right from learning a simple programming language upto performing the most complicated calculations of space

technology, the computers have become almost indispensable. The government organizations, educational institutes and research institutes have accepted computer for all their needs of data storage, processing and report retrievals. It is used for online training.

10) **Space Technology :** The assembling of space shuttles followed by an adequate quality control and testing is normally performed with the help of large computers in the space technology. Even the path control of space shuttles is done entirely through computer. Apart from this, number of information regarding atmospheric pressure, temperatures, movements of planet and all relevant information are stored in computer which helps in making the space program a success.

11) **Weather Forecasting :** The computers have extended their use in giving the exact weather forecasting for entire country. The computer stores all the data required about the pressure in air, temperature, hot currents etc. in its memory and supplies the daily forecast after proper calculations and certain logical decisions. The forecast can be possibility of rains, the temperature in different parts of country and trend of sea water regarding tide and ebb. The rain prediction helps the formers for better crops, saves fisherman from tide and temperature information is for the benefit of public in general.

12) **Manufacturing System :** It is used in operation of manufacturing systems. The computer can provide instructions to the manufacturing machine which performs the machining system operations according to the type of drawing supplied. The use of computer system allows animations, and alternate design being evolved.

13) **Crime Detection :** The computer has been proved as an effective tool in keeping track of perfect information regarding crime. The finger prints, the crime pattern, sequences of crime and the personal records of all professional criminals are stored in the computer storage when and incident of a fresh crime comes to the notice of authorities, the execution of crime is compared with that of the

computer records. This helps in the detection of criminal, checking the past record of criminal and for preventive measures to control the crime level in a particular area. The Police Deptt., Central Bureau of Investigations, the Regional Forensic Laboratory are required with full fledged computer systems.

14) **Research :** It is used in scientific research to find new technologies, to obtain assessment of the experimental results. The number of scientific institutions are using large level mini computers for their scientific computations. Because of their basic characteristics of high speed in calculations and wide storage, computers can play a vital role for such institutions, in arriving at a required result.

15) **Government Organizations :** As the union and state government have a large setup of functions, computers can do a lot of them. Management Information System (MIS), for government is fully computerized, which provides upto date data for quick and correct decisions for police. The distribution system of sales supplies, financial control and budgetary systems are based upon the information provided by the mainframe computer systems installed at government offices.

16) **Recreation :** The computers have a variety of software for games and recreations. The games have been designed for all the level of people. This fact has made computer the most popular amongst all the age groups of people.



## CHECK YOUR PROGRESS

**Q.1 :** Fill in the blanks with appropriate words:

i) Management Information System is a tool used by ..... for improving the productivities.

ii) E-Commerce is the ..... activity performed by use of electronic media.

iii) The Control Unit, Arithmetic Logic Unit and ..... together form the Central Processing Unit (CPU) of the computer.

iv) Database Management Software helps to work with facts and figures, particularly stored in .....

v) Entertainment software transforms your computer from productivity and business to .....

**Q.2 :** Define Web page.

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## 10.6 LET US SUM UP

- Information Technology is primarily concerned with acquisition, storage, processing and organization of data. It is also concerned with widely disseminating organized and processed data for use by people and organizations. In early days of IT, data mainly meant numbers and text. This has changed now. Now data in all forms numbers, text, graphics, audio and video are processed by computers toolstools.
- The hardware of the computer consists of different types of units such as memory devices, CPU, input and output devices. Networking of computers increases the utility of each computer as it can obtain services of other computers and expensive peripherals attached to the network. Internet is a world wide network whose constituents are millions of smaller networks. In other words it is a network of networks. Operating system is an organized collection of programs that acts as an interface between machine hardware and the user providing the user with a set of facilities and maintenance of the program. Application software are developed for the specific area of application.
- The sharing of business information, maintaining business relationships and conducting business transactions using

telecommunication networks is usually defined as E (Electronic)-Commerce.

- Multimedia refers to the integrated use of multiple media, such as slides, video taps, audio tapes, records, CD-ROMs, and photos.
- Information Technology (IT) is profoundly affecting our day-to-day living. Computers are everywhere: in government offices, courts, businesses, public utilities, banks, homes etc. It is essential to be conversant with their applications and know how to use them to live in today's world.



## 10.7 FURTHER READING

1) Jain, V.; *MS Excel 2002–Training Guide*, BPB Publication, New Delhi.

2) Lotia, M.; *World 2000–An Introduction*, BPB Publication, New Delhi.

3) Rajaraman, V. (2004); *Fundamentals of Computers*, 4th Edition, Pentice-Hall of India, New Delhi.

4) Syganski; *Introduction to Information Technology*, Pearson Education, Delhi-110092.

5) Witherspoon; *PowerPoint 2000 Fast & Easy*, BPB Publication, New Delhi.



## 10.8 ANSWER TO CHECK YOUR PROGRESS

**Ans. to Q. No. 1 :** i) Management, ii) commercial, iii) Memory Unit, iv) database, v) fun and games.

**Ans. to Q. No. 2 :** A Web page represents a single location on the Web. A Web site is made up of two or more interconnected Web pages presented as a unified place on the Web. A common term used on the Web is home page. This is the intended central or starting place on a Web site.



## 10.9 MODEL QUESTIONS

**Q.1 :** Define Information Technology: What is the difference between data and information? Give an example of organizing data which allows human decision making.

**Q.2 :** Discuss the different areas of Information Technology.

**Q.3 :** What are the ways IT is affecting our day-to-day life?

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# UNIT 11: INTRODUCTION TO E- COMMERCE

## UNIT STRUCTURE


11.1 Learning Objectives

11.2 Introduction

11.3 Meaning of e-commerce

11.4 Nature of e-commerce

11.5 Types of E-commerce

- 11.5.1 Business to Customer E-Commerce
- 11.5.2 Customer to Customer E-Commerce
- 11.5.3 Business to Business E-Commerce
- 11.5.4 Business to Government

11.6 Comparison between Traditional Commerce and E-Commerce

11.7 Advantages and Disadvantages of E-commerce

11.8 Reasons for Transacting On- Line

11.9 Categories of E-commerce

- 11.9.1 Electronic Markets
- 11.9.2 Electronic Data Interchange (EDI)
- 11.9.3 Internet Commerce

11.10 Let Us Sum Up

11.11 Further Reading

11.12 Answers to Check Your Progress

11.13 Model Questions


## 11.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

- explain the meaning and nature of e-commerce
- describe the history of e-commerce
- discuss the advantages and disadvantages of e-commerce
- explain the scope and reasons for transacting on-line
- identify the different categories of e-commerce

## 11.2 INTRODUCTION

Commerce (the trading of goods) has been a major impetus for human survival since the beginning of recorded history and beyond. The mass adoption of the Internet has created a paradigm shift in the way businesses are conducted today. The past decade has seen the emergence of a new kind of commerce: e-commerce, the buying and selling of goods through human-computer interaction over the Internet.

## 11.3 MEANING OF E-COMMERCE

E-commerce or electronic commerce is an emerging concept that describes the process of buying and selling or exchanging of products, services and information via computer network including the Internet. It includes all inter-company and intra-company functions (such as marketing, finance, manufacturing, selling, and negotiation) that enable commerce and use electronic mail, Electronic Data Interchange (EDI), file transfer, fax, video conferencing, workflow, or interactions, workflow, or interaction with a remote computer.

The concept of e-commerce is spanned across various dimensions. Hence different schools of thought gave different definitions with different perspectives. Some defined it from business perspective and some defined with service perspective.

E-commerce can be defined from various perspectives as:

- Communications perspective: From a communication perspective, e-commerce is delivery of goods, services, information or payments over computer networks, telephone lines or any other electronic means.
- Business perspective: From a business perspective, e-commerce is the application of technology toward the automation of business transaction.
- Service perspective: From a service perspective, e-commerce is a tool that addresses the desire of firms, consumers and management

to cut service costs while improving the quality of goods and increasing speed of service delivery.

- Commercial (trading) perspective: From a commercial perspective, e-commerce provides the capability of buying and selling products, services and information on the Internet and via other online services.
- Learning perspective: From a learning perspective, e-commerce is the framework of inter-and intra organizational collaboration.
- Community perspective: From a community perspective, e-commerce provides a gathering place for community members to learn, transact and collaborate.

The origin of commerce by exchanging goods occurred before recorded history, now commerce is a basic activity in everyday life. Entering into the electronic era, the way individuals and organizations do business and undertake commercial transactions have been changed. It indicates the movement towards electronic commerce. This means there is less paper work and physical transaction is limited. The emergence of electronic commerce started in the early 1970s with the earliest example of electronic funds transfer (EFT), which allows organizations to transfer funds between one another electronically. Then another technology: Electronic Data Interchange (EDI) was introduced. It helps to extend inter business transactions from financial institutions to other types of business and also provides transactions and information exchanges from suppliers to the end customers. However, the early system of development was limited to special networks such as large corporations and financial institutions, which were costly and complex to administer for small business. So EDI was not widely accepted as expected.

With the progress of Internet technology and a highly developed global Internet community, a strong foundation of prosperous electronic commerce continues to be built. During the 1990s, the Internet was opened for commercial use; it was also the period that users started to participate in World Wide Web (WWW), and the phenomenon of rapid personal computer (PCs) usage growth. Due to the rapid expansion of the WWW network; e-

commerce software; and the peer business competitions, large number of dot-coms and Internet start-ups appeared in business world. Integrated with the commercialization of the Internet, Web invention, and PC networks made electronic commerce possible and successful.



**CHECK YOUR PROGRESS**

**Q.1 :** Define E-commerce.

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## 11.4 NATURE OF E-COMMERCE

E-commerce is a modern business methodology, which helps the companies and the consumers to have better business facilities through less cost while improving the quality of goods and services and increasing the speed of transactions.

E-commerce covers online selling and transactions, web retailing and wholesaling, electronic banking interactive marketing etc. It involves multimedia advertising, product information, customer support on the World Wide Web via internet, payment mechanism through bank etc.

E-commerce brings revolution to the concept of market segmentation. We can think that the importance of this concept, in its traditional sense, diminishes, as customization is the buzz word in present world. It is the evolution of niche marketing. The need for individualization has been identified within the context of recent change in the theory of value chain management.

E-commerce is a very valuable weapon. Its most important characteristic is interactivity which keeps the customer involved in the company's processes. Interactivity is the mean to individualization.

Furthermore, it is cheap as long as you use internet or reform already installed EDI (Electronic Data inter change).

At this point, lest us discuss certain drivers of E-Commerce, which are as follows:

1. Digital convergence -The digital revolution has made it possible for almost all digital devices to communicate with one another. The Internet's massive growth during the past 10 years, which is completely a creation of market forces, will continue.
2. Ubiquity - Today's E-Commerce is available to anyone, anywhere, in the world, 24 hours a day, 7 days a week. E-Commerce ties together the industrial sector, merchants, the service sector, and the content provider using text, multimedia, video, and other technologies.
3. Changes in organizations - More and more today's business empower front -line workers to do the kind of work once performed by junior management. A trend also is developing toward partnering owners and managers across departments to develop a chain of relationships that adds value to the enterprise.
4. Information Density - Global competitions and the proliferation of products and services worldwide have added unusual pressure to keep a close watch on operating costs and maximize profit margins. E-Commerce addresses their concerns quickly, efficiently and at a low cost.
5. Personalization/ Customization - Today's customers are collectively demanding higher quality and better performance, including a customized way of producing delivering, and paying for goods and services. Mass customization puts pressure on firms to handle customized request on a mass-market scale.

## 11.5 TYPES OF E-COMMERCE

The telecommunication system used in e-commerce is the Internet which connects computers all over the world which can communicate with one another using well-defined rules (called a standard protocol).

The Internet by itself remained the preserve of academic institutions for several years until its commercial potential was understood. This led to the emergence of a number of Internet Service Providers (called ISPs) who provide value-added services to their customers using the Internet

infrastructure. The general public was thus able to use the Internet and the number of Internet users increased by leaps and bounds all over the world particularly with improved communication infrastructure. This spawned a number of innovations in business between commercial organizations and commercial organizations and between individuals. These transactions are commonly known as Business to Business (B2B), Business to Customer (B2C) and Customer to Customer (C2C). Another new entrant is Government to Business (G2B) in which individuals and business organizations can transact business with the government using the Internet. Business transactions include orders sent to vendors to supply items, invoices sent by vendors, payments made by credit cards, payments through electronic funds transfer and cash payments made using what is known as electronic cash. The important point is that all transactions are carried out electronically using the network infrastructure. There are a variety of e-commerce applications. Some of these are as follows:

- Retail sales of goods such as books, CDs, toys, etc.
- Auction sites using which an individual buyer and seller can buy and sell goods.
- Railways, airlines, hotels, etc., which permit booking on-line and payment by credit card.
- Banks providing information using the Internet on the status of accounts to customers.
- Cooperating business carrying out transactions in a semi-automated manner using the Internet.
- Filing tax returns with government agencies and obtaining immediate acknowledgement.
- Web-based education by delivering lessons on-line examinations, and certification.
- Delivering music, video entertainment (movies, sports events, etc.) and books via the Internet or an appropriate communication medium for all those subscribing for the service.

Every day new ideas seem to be emerging in electronic commerce which addresses its wide reach and round the clock functioning.

### 11.5.1 Business to Customer E-Commerce

When an individual buys items from a shop using the Internet and the entire transaction is carried out electronically, we call it business to customer e-commerce and it is abbreviated as B2C e-commerce. The shops which transact business using the Internet are called by various names, same of which are e-shop and cyber shop. One of the earliest e-shops was a bookstore called amazon.com set up in USA which primarily sells books and has now added other items such as gifts, music CDs, etc. Currently many similar shops are being established in India e.g. indiabook.com. All e-shops have the following common characteristics.

1. Persons who want to shop have to use the Internet. They may have Internet access from home or workplace or an Internet kiosk i.e. cyber cafes. A customer normally knows the web address of the shop with whom he or she wants to transact business and typically uses a web browser such as Netscape or Internet Explorer and enters the web address of the shop.
2. The home page of the shop is displayed which provides various options to a customer. If a customer wants to buy a book, he or she keys in its particulars. He or she may also request books available on a particular subject in which case the shop would search its database and give a list of books available on that subject. The shop may also display the contents page of a book selected by the customer, reviews of the book, its cost and discount if any.
3. If the customer wants to buy one or more books, he or she points to the book details displayed on the screen using the mouse and clicks. The vendor's computer enters the prices of the book(s) selected by the customer, provides discount (if any)

and displays the net amount payable. The customer enters the shipping address and payment is usually by credit card. The credit card numbers are entered which is used for charging the customer. Sometimes option is also given to pay cash on delivery. Credit card payments are more common. As the Internet is not very secure, it is necessary to hide the details of the credit card number from snoopers and also from the merchant. The credit card details should be available only to the bank authorizing payment. It is done by using a protocol called secure Electronic Transaction protocol (abbreviated as SET protocol) .

4. The credit card details entered by a customer is sent in an encrypted (i.e., secret coded) form over the Internet and is forwarded to the authorizing bank by the merchant.
5. If the credit is OK, the bank authorizes the transaction.
6. The e-shop acknowledges the order and gives the details of delivery period and mode of shipment as desired by the customer.
7. The e-shop acknowledges the order and gives the details of delivery period and mode of shipment as desired by the customer.
8. The e-shop may not stock the items in its warehouse. It sends an electronic request to the distributor to ship the items either directly to the customer or to the e-shop for packing and forwarding. If it is a fast moving item, e-shop will normally stock the item and dispatch it to the customer.
9. The credit card company's bank credits the shop's bank account electronically and sends a bill to the customer.

### 11.5.2 Customer to Customer E-Commerce

Customer to customer e-commerce (C2C e-commerce) is one in which two individuals wants to sell/buy items. The items are usually used items, collector's items such as stamps, coins or antiques.

The seller posts the description of the item and the expected price of the item on a web site maintained by a company which acts as a broker. An individual who logs on to this site looking for items may be interested in the item advertised for sale. He/ she then offers to buy thee item and may quote a price. The price is mutually settled between the two parties by exchanging messages through e-mail. The broker then arranges to collect the item from the seller and dispatches it to the buyer and collects payment for the item and a fee from the buyer and the seller for services. The primary advantage of this transaction is that the Internet enables two individuals located at distant places to come together to buy and sell using an intermediary's web address.

### 11.5.3 Business to Business E-Commerce

Business to business e-commerce (B2B e-commerce) is perhaps the most important of the three e-commerce modes. It is growing very fast and it is predicted that most businesses in the world will participate in B2B e-commerce during this decade.

Business to business or B2B refers to e-commerce activities between businesses. An e-commerce company can be dealing with suppliers or distributors or agents. These transactions are usually carried out through Electronic Data Interchange or EDI. EDI is an automated format of exchanging information between businesses over private networks. This allows more transparency among business involved; therefore business can run more efficiently, for instance, a supplier can respond faster to diminishing stock of a particular product. EDI is composed of standards that enable businesses' computers to conduct transactions with each other without human intervention. In general, B2Bs require higher security needs.

With the help of B2B e-commerce, companies are able to improve the efficiency of several common business functions, including supplier management, inventory management and payment

management.

Using e-commerce enabled business applications, companies are able to better control their supplier costs by reducing PO (purchase order) processing costs and cycle times. This has the added benefit of being able to process more PoS at a lesser cost in the same amount of time. E-commerce technology can also serve to shorten the order-ship-bill cycle of inventory management by linking business partners together with company to provide faster data access. Businesses can improve their inventory auditing capabilities by tracking order shipments electronically, which results in reduced inventory levels and improves upon the ability of the company to provide "just-in-time" service.

This e-commerce technology is also being used to improve the efficiency of managing payment between a business and its partners and distributors. By processing payments electronically, companies are able to lower the number of clerical errors and increase the speed of processing invoices, which results in lowered transaction fees.

### 11.5.4 Business to Government (B2G)

It is a new trend in e-commerce. This type of e-commerce is used by the government departments to directly reach to the citizens by setting-up the websites. These websites have government policies, rules and regulations related to the respective departments. Any citizen may interact with these websites to know the various details. This helps the people to know the facts without going to the respective departments. This also saves time of the employees as well as the citizens. The concept of Smart City has been evolved from B2G e-commerce.



**CHECK YOUR PROGRESS**

**Q.2 :** Define C2C e- commerce.

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## 11.6 COMPARISON BETWEEN TRADITIONAL COMMERCE AND E-COMMERCE

In many cases business processes use traditional commerce activities very effectively, and these processes cannot be improved upon through technology. Products that buyers prefer to touch, smell, or examine closely are difficult to sell using electronic commerce. For example, customers might be reluctant to buy high-fashion clothing and perishable food products, such as meat or produce, if they cannot examine the products closely before agreeing to purchase them. In the case of traditional commerce retail merchants have years of experience in creating store environments that help convince a customer to buy. This combination of store design, layout and product display knowledge is called merchandising. Sales people in course of time develop skills that allow them to identify customer needs and find products and services that meet those needs. The arts of merchandising and personal selling can be difficult to practice over an electronic link. Through e-commerce branded products such as books or CDs can be easily sold. As one copy of a new book is identical to other copies and because a customer would not be concerned about freshness he would willingly order a title without examining the specific copy they would receive. The advantage of electronic commerce, namely the ability of one site to offer a wider selection of titles than even the largest physical bookstore, can outweigh the advantage of a traditional bookstore, namely the facility to browse.

## 11.7 ADVANTAGES AND DISADVANTAGES OF E-COMMERCE

Some of the advantages of E-commerce for the consumer are-

- Avoiding crowds by shopping online in the comfort of your home or office
- Shopping at your time (internet stores are open 24 hours a day, 7 days a week and 365 days per year)
- Your purchases are delivered directly to your home or office
- Unlimited choices

There are many advantages of businesses as well, particularly small and /or home businesses such as-

- Lower startup and overhead expenses
- Global Exposure -unlimited marketing Reach
- Automated order processing

The major advantages which accrue to businesses that participate in E-Commerce are as follows:

1. Business can reach out to customers worldwide at low cost. A well-designed web page will be an asset to any business to publicize their goods and services and also to sell their merchandise.
2. Order processing time and cost are reduced as manual entry of data is reduced. When a vendor receives a purchase order, he or she need not reenter it on his system for data processing. Businesses are also carried out faster as electronic exchange of documents is instantaneous across the world.
3. A manufacturing organization requires components which are supplied by several vendors. For example, a car manufacturer will receive supplies of tyres, electrical items, nuts, bolts, etc., from several vendors. There are thousands of such items and tracking and regulating supplies is a complex task. This is called Supply Chain Management (SCM). SCM becomes simple and fast in E-Commerce. When cooperating businesses are connected by an Extranet or VPN, regular suppliers can observe the production plans and inventories of a manufacturer and adjust their supply schedules,

inventories, etc. This is possible as remote log in and access to databases of cooperating business may be mutually agreed. This reduces inventory sizes leading to cost reduction of goods.

4. Electronic funds transfer is fast and safe.

5. A large number of potential business partners can be quickly found and contacted by searching the World Wide Web.

6. Certain types of goods can be customized and sold directly by a manufacturer or assembler eliminating middleman. For example, Dell Computers sells PCs directly to customers configuring them as per individual's requirements. Middlemen such as distributors and retailers are eliminated. Supply chain management is improved as manufacturers can adjust their inventory level of items and order processing based on customer orders in hand and customer preferences gathered over a period of time.

7. The cost of setting up an E-Commerce site is quite small compared to the cost of having large premises.

8. The cost of transactions is quite low. It is estimated that transaction costs are less than fifth of that of traditional business.

9. There are some items such as airline tickets where competing airlines provide several special packages and prices. Quick comparison is possible on the World Wide Web and a confirmed booking obtained on-line. For airlines also it is an easy method of attracting a large clientele without expensive promotional expense.

10. Companies can maintain on-line e-catalogue of items and a price list which can be quickly updated. This is much cheaper than printing and distributing catalogues and price lists. Electronic versions can be changed quickly when new items are added/ deleted.

11. Customers can be serviced on-line expeditiously.

12. There are industries such as automobile manufacturers where a large number of ancillary units produce subsystems such as horns,

brake linings, tyres, lights, etc. E-shopping to get the best deals and delivery has now become very common in B2B commerce. Intermediaries also provide auction sites which allow expeditious price negotiation. This allows lowering of costs and so called just-in-time manufacturing.

The major disadvantages of E-Commerce are given as follows:

1. Currently Internet access is not widely available in India. Communication infrastructure is expensive and not very reliable particularly to individuals. This is, however, improving.
2. Payment by credit card requires faith in the system security. Customers hesitate to give their credit card numbers to vendors who have only a "web presence". Secure credit card transactions in which credit card numbers are encrypted and sent to a vendor are essential.
3. Electronic Data Interchange standards have to be in place before business to business e-commerce can increase. Small businesses may find it difficult to conform. Data interchange using XML (a new document description language) is expected to solve this problem.
4. Many persons go shopping for social contacts, touch and feel and bargaining before buying items. E-commerce will de-personalize transactions.
5. A major concern is security of transactions on the Internet. Spies or hackers can steal and misuse credit card numbers, purchase orders , invoices etc., if appropriate care is not taken.
6. Shopping portals will be vulnerable to attacks by hackers unless special precautions are taken. One type of nuisance is called denial of service in which a large number of frivolous enquiries are posted to a portal making it inaccessible to legitimate customers.
7. Portals have to be protected by special security systems from virus attacks and other electronic vandalism and espionage.
8. Customers' privacy may be lost if regular log is kept of their buying habits.
9. The web site of vendors should have the capability of being scaled

up quickly when the number of users suddenly increases. If the server's capability is limited, the response time of the site will be unacceptably high if a large number of customers decide to use the site. Thus, a vendor should be able to add more servers quickly when this happens.

10. If there is a sudden increase in orders, there may be logistical problems in physically delivering items to customers. Long delays in receiving ordered goods will adversely affect future sales. Being prepared to handle seasonal surge in demand requires pre-planning.
11. When a successful e-business is launched, immediately there will be many copy cats who will attempt to duplicate it. Duplication is much simpler in e-commerce compared to traditional business as it is easy to quickly build a web site and start a competitive business. Thus to maintain the advantage of being first with the idea requires continuous innovation and improvement.
12. On-line businesses expose their catalogues and price lists to competitors. The advantage of secrecy of traditional mode of doing business is lost.
13. Not every item is suitable for sale in the web. For example saris, fancy furniture, etc., which require touch and feel are unsuitable for sale through the web.

In spite of these disadvantages, e-commerce is bound to rapidly increase due to its convenience, cost saving and wide reach.



**CHECK YOUR PROGRESS**

**Q.3 :** State two advantages of e- commerce for the consumer.

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**Q.4 :** State two disadvantages of e- commerce.

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## 11.8 REASONS FOR TRANSACTING ON- LINE

**SCOPE OF E-COMMERCE:**

The scope of e-commerce is very wide. It connects the management of the enterprises to the various aspects of trading viz, suppliers, distributors, retailers, consumers and well other traders on the global e-commerce infrastructure. The enterprise provides product development, conferencing, accounting financial planning, logistics etc. through e-commerce. Other concerned areas are-

- Suppliers, mainly concerned with product sourcing, information, purchase process, supplier management etc.
- Distributors and retailers, it involves market response, inventory, product information, order fulfillment, accounts etc.
- Consumers, it is mainly web marketing, e-shopping, information and online services, trading, service and sales etc.

On the global e-commerce front, it mainly concerned with security, e-banking, legal issues, e-market information, human-computer interface, national/global information infrastructure etc.

**REASON FOR TRANSACTING ON-LINE:**

With the rapid downfall of world economy and dot-com companies in recent years many brick-and -mortar companies and new start-ups ask themselves: "To be online or Not to be online"

Some of the main reasons are stated below -

**New economy:** Internet has created a new economy, which by its explosive growth and sheer size already changed our perception of traditional way of doing business. However, in order to be successful on the net, the size of the organization does not matter. Many small and mid-size companies managed to build online businesses quite profitably. In fact, studies show small and mid-size companies will be the main growth force of e-commerce in coming years.

**Internet is a perfect venue for Business:** In order to make a sale you need visitors to come to your shop. On the internet, your shop could be only

a click away from your prospective customers. With proper marketing your internet store front can have more buyers than you ever can get in a brick and mortar shop.

**Company Image:** Whether you sell products or services online or not, in today's world you have to have a corporate presence on the internet.

**Provide better customer support:** Customer retention is one of the key factors of business value chain. This means better customer satisfaction and increase of profitability.

**Make information more easily available to customers:** Today you can add or make any changes to your company and product related content virtually in a matter of couple of hours, publish on your site and share with the whole world.

**Cut costs:** New technologies allow you to take virtually any part of your business online, that include supply chain management, billing, shipping , procurement etc. Streamlining these business processes through on-line systems will allow companies to cut costs significantly in almost every sphere of business activities.

**Ability to do business 24 hours:** The biggest advantages of online shops are that they are open for 24 hours a day and seven days in a week.

**Low start up costs:** Building a web site does not require big investments. There are many low cost tools available today, which can help you create sites from very scratch.

**Physical presence could be in any location:** The world wide web allows the business to do business from any part of the world. The physical location, except for few cases is not that important in online business.

**Go Global:** Over internet one can instantly become a global player. There are literally hundreds of vertical and horizontal e-market places available on the net.

The right determinant of e-business success is the same like any of line business.



**CHECK YOUR PROGRESS**

**Q.5 :** Discuss two reasons for transacting online.

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## 11.9 CATEGORIES OF E-COMMERCE

E-commerce system includes commercial transactions on the Internet but their scope is much wider than this. They can be classified by application as:

1) Electronic Markets

2) Electronic Data Interchange

3) Internet Commerce

### 11.9.1 Electronic Markets

The principal function of an electronic market is to facilitate the search for the required product or service. Airline booking system is an example of an electronic market.

An electronic market uses information and communication technologies to provide geographically dispersed customer with the information necessary for the fair operation of the market. The electronic market can bring together the product, price and service information from many or most suppliers of a particular class of goods or in a specific trade sector. Easy access to information on a range of competing product offerings reduces the search cost of finding the supplier that best meets the purchase requirement. An electronic market place can be defined as

"An inter-organizational information system that allows participating buyers and sellers to exchange information about price and product offerings".

The electronic market is, in effect, a platform that bring together

the suppliers and customers in a specific market segment.

The particular strength of an electronic market is that it facilitates the finding the best option to buy. Having found an appropriate offering the electronic market will then, normally, include facilities for the execution and settlement of the transaction.

Electronic markets are also used in the financial and commodity markets and again the dealing is done via intermediaries; to buy or sell stocks and shares.

The use of electronic markets has served the customer well. With the assistance of a good travel agent the airline customer can be informed of all the flights available for an intended journey and then select, on the basis of price, convenience, loyalty scheme, etc. the flight that they wish to book.

### 11.9.2 Electronic Data Interchange (EDI)

Electronic Data Interchange (EDI) is used by organizations for transactions that occur on a regular basis in a predetermined format.

EDI is the most commonly applied in the Execution and Settlement phases of the trade cycle. In execution of a simple trade exchange, the customer's order can be sent by EDI and the delivery notification from the supplier can also be electronic. For settlement the supplier can use EDI to send the invoice and the customer can finish the cycle with an electronic fund transfer via the bank and an EDI payment notification to the supplier. This whole cycle may be more complex and other electronic messages can be included. The cycle can be repeated many times, as often as the supermarket wants to buy cornflakes or the vehicle assembler needs new supplies of wheels.

EDI can be used for Pre-sales transactions; there have been EDI messages developed for transactions such as contract but they are widely implemented. Finding an appropriate trading partner and negotiating conditions of trade is likely to be undertaken by a member

of staff in the buying department (or a manager on the golf course). The Pre-Sales phase could also involve the use of an electronic market, or an open access network such as the internet.

**The Benefits of EDI**

EDI can bring a number of advantages to the organizations that use it. It should save considerable time on the exchange of business transactions and has the potential for considerable savings in costs.

EDI can be simply used to replace paper transactions with electronic transactions- this is the normal route taken in the initial installation of EDI. The full advantage of EDI is only realized when business practices are restructured to make full use of the potential of EDI; when EDI is used as an enabling technology to change the way the business operates- just-in-time (JIT) manufacture and quick response supply being prime examples of where EDI is used as an enabling technology to gain competitive advantage.

### 11.9.3 Internet Commerce

The Internet (and similar network facilities) can be used for advertising goods and service and transacting one-off deals. Internet commerce has application for both business -to-business and business to consumer transaction.

Internet e- Commerce

The basic elements of internet use and of internet e-commerce are:

The user of the system with a computer hooked -up to the internet. The user accesses the internet using software known as a browser, e.g. Netscape or Internet Explorer; the computer running the browser is the client.

The content provider who has set up an Internet application and installed it on an Internet linked computer. The computer that holds the Internet content is known as a server.

The Internet application may be linked to back office systems to process transactions and utilize information held on databases.

For Internet services provided through the World Wide Web (web) the data is formatted, for the basic web page, HTML.



**CHECK YOUR PROGRESS**

**Q.6 :** Define EDI.

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## 11.10 LET US SUM UP

In this unit we have discussed the following aspects:

- E-commerce or electronic commerce is an emerging concept that describes the process of buying and selling or exchanging of products, services and information via computer network including the Internet.
- E-commerce covers online selling and transactions, web retailing and wholesaling, electronic banking interactive marketing etc. It involves multimedia advertising, product information, customer support on the World Wide Web via internet, payment mechanism through bank etc.
- ISP means Internet Service Provider.
- The online commercial transactions are commonly known as Business to Business (B2B), Business to Customer (B2C) and Customer to Customer (C2C).
- The advantages and disadvantages of e- commerce.
- The different reasons for transacting online are - Company Image, Provide better customer support, Make information more easily available to customers, cost cutting etc.
- The different categories of e- commerce are electronic markets, electronic data interchange and Internet commerce .



## 11.11 FURTHER READING

1. Ravi Kalkota and Andrew B. Whinston(); Electronic commerce, A manager's guide, Pearson Education.
2. David Whiteley(), E-Commerce, Strategy, Technologies and Applications , Tata Megraw-hill.



## 11.12 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q1:** Commercial transactions conducted electronically on the internet. That means the buying and selling of products and services by business and consumers over the internet.

**Ans to Q2:** Customer to customer e-commerce (C2C e-commerce) is one in which two individuals wants to sell/buy items. The items are usually used items, collector's items such as stamps, coins or antiques.

**Ans to Q3 :**

i. Avoiding crowds by shopping online in the comfort of your home or office

ii. Unlimited choices

**Ans to Q4 :**

i. Currently Internet access is not widely available in India. Communication infrastructure is expensive and not very reliable particularly to individuals. This is, however, improving.

ii. Payment by credit card requires faith in the system security. Customers hesitate to give their credit card numbers to vendors who have only a "web presence". Secure credit card transactions in which credit card numbers are encrypted and sent to a vendor are essential.

**Ans to Q5 :**

**i. New economy:** Internet has created a new economy, which by

its explosive growth and sheer size already changed our perception of traditional way of doing business. However, in order to be successful on the net, the size of the organization does not matter. Many small and mid-size companies managed to build online businesses quite profitably. In fact, studies show small and mid-size companies will be the main growth force of e-commerce in coming years.

ii. **Internet is a perfect venue for Business:** In order to make a sale you need visitors to come to your shop. On the internet, your shop could be only a click away from your prospective customers. With proper marketing your internet store front can have more buyers than you ever can get in a brick and mortar shop.

**Ans to Q6 :** Electronic Data Interchange (EDI) is used by organizations for transactions that occur on a regular basis in a predetermined format.



## 11.13 MODEL QUESTIONS

**Q.1.** Define E-commerce.

**Q.2.** Discuss the advantage of E-commerce.

**Q.3.** Discuss the reasons for the growth of E-commerce.

**Q.4.** Discuss the different categories of e-commerce.

**Q.5.** Define EDI.

*** ***** ***

# UNIT 12: E-BUSINESS

## UNIT STRUCTURE


12.1 Learning objectives

12.2 Introduction

12.3 Internet Book Shops

12.4 Grocery Supplies

12.5 Software Supplies and Support

12.6 Electronic Newspapers

12.7 Internet Banking

12.8 Virtual Auctions

12.9 Online Share Dealing

12.10 Gambling on the Net

12.11 Web Booking System

12.12 Let Us Sum Up

12.13 Further Reading

12.14 Answers to Check Your Progress

12.15 Model Questions


## 12.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

- discuss the application of internet in different businesses like book shops, grocery
- explain the importance of internet in terms of electronic newspaper, internet banking, virtual auctions etc.
- explain the system of online share trading, web booking system etc.

## 12.2 INTRODUCTION

The application of internet is proving beneficial for the business houses and then consumers. The business houses are using as a new channel to offer the goods and services as well as to reduce the cost in

distribution. They are targeting a new set of customers who are present over the net. The customers are also making it as a way of life to purchase groceries, making payment over internet etc. in this unit we are going to discuss the various business segments where there is proliferation of internet use.

E-business involves changes in an organizations business and functional process with the application of technologies, philosophies and computing paradigms of the new digital economy. It is an Internet initiative which transforms business relationships. It includes all aspects of e-commerce with the help of e-business solutions, the companies have succeeded in developing their technology and increasing their turnover.

E-commerce have helped create a system of applications and utilities whereby money, information and services can be exchanged via the web. It is important to align the main business of the firm with the e-business strategy of the firm in order to succeed.

E-commerce uses a single set of technologies. The infrastructure for an e-shop selling books is essentially the same as is used for the online sale of airline tickets. The important differences between e-commerce applications are how they fit into the consumer market, how they are supported by the supply chain and their potential to alter the role of players in that supply chain.

An e-shop may be set up by:

- A new entrant to an existing market;
- An existing player in the market using the internet to develop a new sales channel.

New entrants to the market have the potential to threaten the market position of existing players but they have to build up expertise to support their operations. Existing players in a market may respond to the new entrant by sharpening up their conventional retail act or by setting up a competing online channel; the latter course of action adds to the threat to their investment in the conventional distribution channel.

The e-commerce applications also need an effective supply infrastructure; the online purchaser is not going to be impressed by lines that are out-of - stock or goods that take forever to arrive. An existing retailer

has supply chain arrangements that have been built up and tuned over time. The new entrant to the market has to match this efficiency by quickly setting up similar arrangements or developing an alternative infrastructure that better meets the needs of its way of conducting business.

## 12.3 INTERNET BOOK SHOPS

It is one of the applications of e-commerce in consumer market. Books as an item of merchandize have the following significant advantages for the online retailers:

- Books can be described well on the Internet. Moreover, it is not an item which is required to be checked physically.
- Normally, the books have nominal prices and not too much risk is involved in the online payments.
- Books are small items and can be delivered in the customer's letter box. The customer does not need to be at home.

Amazon.com is an example of Internet Bookshops. The large online bookstores need a sophisticated website, both to attract and retain the attention of their customers. The facilities of the online bookshop may include:

A large database of books. The details available for display include a picture of the cover, description of the book including page numbers, price of the book and reviews of other customers.

The book can be searched with the help of search engines. The search can be made on the author's name, title of the book or the subject etc.

There may be software in the site that may record the interest of the particular customer and can inform the customer on the new arrivals on that subject.

Some large online bookshop sites are:

www.amazon.com

www.barnsandnoble.com

www.bol.com

www.bookshop.blackwell.co.uk



**CHECK YOUR PROGRESS**

**Q 1:** What is meant by Internet Book shops?

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## 12.4 GROCERY SUPPLIES

One who goes to purchase items from the supermarket must be aware of some of the problems as described below.

- The customer has to plan to go to the supermarket at the scheduled time of opening of the supermarket.
- The car park may be overcrowded.
- The supermarket may also have a big crowd. Long queue in front of payment counters loading, loading and unloading of bags

All these problems may be resolved with the help of online supermarket. The online supermarket is set up to meet the needs of those who cannot get to the supermarket or those who do not want to go.

The online supermarket is similar to any other online shop. The customer has to log-on the site and select the groceries that are required and have to place the order. The packing, dispatch etc. will be taken care by the staff of the online grocery supplier.

Some of the noteworthy sites for grocery supplies are as follows:

www.peapod.com

www.homestore.com

www.sainsbury.co.uk

www.tesco.net

## 12.5 SOFTWARE SUPPLIES AND SUPPORT

Software supplies is both a business to business market and a business to consumer market. The Internet as a channel for software sales, including computer games, has two distinct advantages:

– The customers are presumably computer literate and will be able to operate the medium.
– The product is electronic and can be delivered via the net.

The supply chain for software delivered over the net is therefore very simple. It is a straight transaction between the customer and the supplier without the need for any agent or retailer.

For the larger software companies, online sales (if used) are just one sales channel and it is additional to software supplied through agents/ dealers and the local computer stores. For these larger companies, the real advantage in the use of the Internet is for after-sales with information, support and bug fixes being available online. Online support is used by organizations such as Microsoft, Sun and also by software suppliers for mainframe systems.

For a small software outfit, the Internet provides the only readily available marketing channel. Using the Internet, the small software company does not have to make a CD, write a manual and get a box printed. More importantly the small software company does not have to fight to get its product stocked by retailers, it can do its own retailing on the net and it can release its product for a free trial for any customer who is not sure that the product is one that will suit them.

Small software companies using the net sometimes have a limited lifespan. Good ideas that are piloted by small software companies can be taken over by the big companies and the originators are left out from the market.



**CHECK YOUR PROGRESS**

**Q 2:** Explain software supplies and support.

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## 12.6 ELECTRONIC NEWSPAPERS

One of the hot areas on the Internet is the electronic newspaper. Electronic newspaper has advantages over the printed newspapers. In comparison to printed newspaper, the e-newspaper can give up-to-date news. Further, the browser could be set to select the news of interest of the reader and to leave out the rest. This is even not possible with the broadcast news.

Despite the said advantages, the electronic newspapers are not being very popular due to the following reasons:

- Radio and television news are often consumed while people are doing other things like eating their foods or driving car.
- Printed newspapers may be read on the train or in the park and then may be shared with someone else.
- The printed newspapers give the reader the chance to be selective (the selection, depends on the moods and time of the reader).
- There are a number of online newspapers available and most of them are web versions of existing newspapers. The Washington Post is the one that has, to date, received the most favourable coverage.

The online newspapers, it seems, are often used to look up something that has been missed in a previous issue or to look at the job advertisements, rather than being read as a newspaper. Online magazines attract some readership but they have had a hard time attracting subscriptions-there is the ethos that the net should be free and there is also a concern that the magazine might not be as good as it pretends to be or that it may not last the period of the subscription.

There is, however, a threat to conventional newspapers from the web. A large of the revenue that pays for newspapers comes not from the cover price that the reader pays but from the money received from advertisers. The web has the potential to advertise jobs, houses and used cars at a fraction of the price of a newspaper-should the advertising of these items shift to the web then it might not be possible to buy our local newspaper, at least not at a price that the public is prepared to pay.

The supply chain of the online newspaper is also much simpler than that of the paper version. No need for a midnight deadline before the papers are loaded onto lorries, delivered to wholesalers in each major town, re=packaged for delivery to newsagents and then possibly to the door by a paper boy or girl. The supply chain of the online newspaper is direct from the company to the reader's screen.

There are number of online newspapers and most of them are web versions of existing newspapers. For example, www.timesofindia.com, www.dainikjagran.com etc.

## 12.7 INTERNET BANKING

Sometimes the bank, as the customers want to make an urgent payment but to visit the bank is not convenient. Similarly, to go to the bank to just know the balance is also not justified. Internet banking (or telephone banking) can solve these problems. To solve the problems on phone or Internet is also profitable for banks as it reduces their overheads.

With the help of online banking a customer can check his or her balance at any time of the day or night. The customer can also pay various bills like telephone, electricity etc. without going to the bank or billing centers. The typical services offered by the online banking are as follows:

- The customers can check their account balances at any time.
- The customer can obtain statements regarding any specific debit or credit that has gone through.
- Credit transfers so that bill can be paid online.
- Maintenance of standing orders and direct debits.



**CHECK YOUR PROGRESS**

**Q 3:** What are the services offered by the online banking?

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## 12.8 VIRTUAL AUCTIONS

Auctions have been a well-established market mechanism for trading items at a market negotiated price, based upon demand and supply. The Internet has added a new dimension by creating an online mechanism for implementing the auction process. Traditional auctions had limited participation of people who turned up at the place of auction. Today, the same auction mechanisms can be implemented using e-commerce technologies, allowing people connected through the Internet to bid. Electronic auction potentially encourage greater participation as Internet users can connect to a webhosting an auction and bid for an item. www.wbay.com http://www.wbay.com and www.auctionindia.com http://www.auctionindia.com are the examples of such sites.



**ACTIVITY 12.1**

State the differences between Electronic Auction and Traditional Auction.

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## 12.9 ONLINE SHARE DEALING

The use of the Internet is taking off among private investors in stocks and shares. The Internet can make available to the private investor the up-to-the-minute information that, had only been available to those working in financial institutions. The use of online brokerage services automates the process of buying and selling of securities and hence allows a reduction of commission charges. Moreover, the securities being traded are intangible; the ownership of stocks and shares can be recorded electronically so there is no requirement for physical delivery.

## 12.10 GAMBLING ON THE NET

Gambling takes many forms, from the simple scratch card, through betting on various sports events to casino type games (often played for high stakes). All these forms of gambling can be replicated on the web.

Internet gambling can be dated back to 1995 with the establishment of the first online casino. From that start the industry has mushroomed with, four years later, over a thousand casino sites online. The way Internet gambling works is much like any other e-Commerce site; the punter chooses the service and pays with a credit card. Gambling sites can be sophisticated with the facilities of the web used to display the odds, report on the result of the event or simulate the playing of the game.

The gambling supply chain is very simple, the transaction is between the bookmaker or casino and the punter, that applies both online and offline.

For some, all gambling is immoral but most would agree that a little 'flutter' does no harm-and possibly a little good if the profits go to a good cause.

Gambling has, however, a darker side. Gambling addicts ruin their own lives and, not infrequently, the lives of many other. On the other side of the business there is an issue of criminal involvement. For these reasons there has been considerable effort by governments to use the law to regulate gambling.

The use of Internet gambling blows apart the regulatory framework and social controls that consist in conventional gambling. Problems include:

- Social controls that might be exerted over a gambler in a betting shop or a casino do not apply online; at the simplest level there is no closing time;
- The gambling facilities can be based in a country with minimal legislative restrictions and from there it is open for business on a world-wide basis
- Offshore gambling circumvents national taxation requirements;
- Any attempt by a state to monitor online gambling activities would raise civil liberty concerns-the use of encryption for transmission makes any monitoring that is undertaken more difficult;

- The difficulty in regulating online gambling makes it prone to illegal activities, possibly more vulnerable than its conventional counterpart.

## 12.11 WEB BOOKING SYSTEMS

The Internet offers the airlines a new sales channel for airline tickets but also, it is suggested, a way to escape from the current price competitive system. A customer using the airline's own web site does not (in most cases) see the available range of prices from competing airlines; they are presented with only the flights of the airline providing the web page (and any of its code share partners that it wants to include). The airline also attempts to make its web site attractive to the user, 'sticky' in the jargon of web marketing. Added value features that the web service may include are:

- Online presentation of the customer's frequent flyers account;
- Facility for the customer to pre- allocate their seat and select meal options;
- Additional travel services such as hotel booking and car rentals;
- Travel and airport information;
- Access to bargain offers and auctions of airline seats (some auctions are paid for with frequent flyer points);
- Personalization of the web site to suit the customer's expected travel requirements (a profile is developed from the flight booking information stored on the airline's customer information database).



## 12.12 LET US SUM UP

In this unit we have discussed the following aspects-

- In Internet Book shops, the book can be searched with the help of search engines. The search can be made on the author's name, title of the book or the subject etc.
- The online supermarket is set up to meet the needs of those who cannot get to the supermarket or those who do not want to go.

- The supply chain for software is very simple. It is a straight transaction between the customer and the supplier without any involvement of any agent or retailer.
- Electronic newspaper has advantages over the printed newspapers. In comparison to printed newspaper, the e-newspaper can give up-to-date news.
- With the help of online banking a customer can check his or her balance at any time. The customer can pay various bills like telephone, electricity etc. without going to the bank or billing centers.
- The use of online brokerage services automates the process of buying and selling of securities and therefore, allows a reduction of commission charges.
- The Internet offers the airlines a new sales channel for airline tickets.



## 12.13 FURTHER READING

1. Ravi Kalkota and Andrew B. Whinston(); Electronic commerce, A manager's guide, Pearson Education.
2. David Whiteley(), E-Commerce, Strategy, Technologies and Applications , Tata Megraw-hill.



## 12.14 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q No 1:** It is a large database of books. The details available for display include a picture of the cover, description of the book including page numbers, price of the book and reviews of other customers. Books can be described well on the Internet. Moreover, it is not an item which is required to be checked physically.

**Ans to Q No 2:** Software supplies is both a business to business market and a business to consumer market. The Internet as a channel for software sales, computer games, has two advantages:

The customers are presumably computer literate and will be able to operate the medium.

The product is electronic and can be delivered via the net

The supply chain for software delivered over the net is therefore very simple. It is a straight transaction between the customer and the supplier without the need for any agent or retailer.

Online support is used by organizations such as Microsoft, Sun and also by software suppliers for mainframe systems.

For a small software outfit , the Internet provides the only readily available marketing channel. Using the Internet, the small software company does not have to cut a CD, write a manual and get a box printed.

**Ans to Q No 3:** Services offered by the online banking are as follows:

The customers can check their account balances at any time.

The customer can obtain statements regarding any specific debit or credit that has gone through.

Credit transfers so that bill can be paid online.

Maintenance of standing orders and direct debits.

The major service that is not provided is cash in and cash out. To get the money, the customer has to go the bank or ATMs.



## 12.15 MODEL QUESTIONS

**Q 1:** What is meant by Web booking System?

**Q 2:** Write a short note on problems of gambling.

**Q 3:** Write down the services provided by Web Booking system.

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# UNIT 13 : TECHNOLOGY FOR ONLINE BUSINESS

## UNIT STRUCTURE


13.1 Learning objectives

13.2 Introduction

13.3 Internet

- 13.3.1 History of Internet
- 13.3.2 Client – server
- 13.3.3 TCP/IP

13.4 IT Infrastructure

- 13.4.1 Characteristics of IT Infrastructure
- 13.4.2 Elements of IT Infrastructure

13.5 Middleware

13.6 Contents: Integrating text and E-business application.

- 13.6.1 Hypertext
- 13.6.2 Hyper Media
- 13.6.3 HTTP

13.7 Let Us Sum Up

13.8 Further Reading

13.9 Answers to Check Your Progress

13.10 Model Questions


## 13.1 LEARNING OBJECTIVES

After going through this unit, you will be able to-

- explain the characteristics of internet
- trace the history of internet
- discuss the features of client and server
- discuss about internet protocol
- explain the IT infrastructure
- define hypertext and HTTP.

## 13.2 INTRODUCTION

Electronic commerce brings new forms of markets to the consumer and to industry. Through the connectivity provided by the Internet, it is feasible to sell thousands of products at auction as the technology brings buyers and sellers together regardless of their physical location. The Web is responsible for new kinds of markets.

With a computer, a cable modem or a modem and a phone line, and the right software, you can enter into a vast universe of information and interaction on-line. This on-line universe, known as Internet, is a huge worldwide network of computers and other networks. What a highway system is to transportation, the Internet is to data. Research tools, documents, mail, file transfer (FTP), World wide Web and Hyper Text Transfer Protocol (HTTP) and remote login (TELNET) are offered by any computer that has implemented the full set of TCP/IP protocols (the highway system's driving formats and rules).

Any web site that offers products and/or services for sale is a commercial web site. There are thousands of commercial web sites on the Internet. Some of them have been successful, and some weren't so lucky.

## 13.3 INTERNET

A network of networks, or "internet", is a group of two or more networks that are:

- Interconnected physically;
- Capable of communicating and sharing data with each other; and
- Able to act together as a single network.

Machines on one network can communicate with machines on other networks, and send data, files, and other information back and forth.

The three main defining characteristics of the internet are-

- **Interoperable:** Interoperable means that the standards allow communication across networks. This does not limit the access of information to a proprietary site, location, machine or brand name.

- **Packet switched:** Connections are not FIXED from point to point for the duration of the transmission. A telephone call is circuit switched- which means a dedicated path is established to transmit your entire conversation. When data is sent packet switched over the internet-it transmits a small part of the data, verifies it is correct, then sends more information toward the destination. Packet switched networks do not required all of the information to be delivered through the same path. By not dedicating the path for the duration of the connection, this method allows more connections to be sending information across the same space or allows for sharing resources.
- **Data network:** A network that carries data information (digital-computer) instead of voice information (analog-telephone). There are many instances where these 'definitions' of data and voice are starting to overlap. Computers connecting to regular phone lines are technically carrying data over a voice line and in some progressive parts of the country digital phone lines are starting to make appearances.



**CHECK YOUR PROGRESS**

**Q 1:** Define internet.

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## 13.3.1 History of Internet

The Internet has evolved through a series of advancements in networking and computer technologies. From its beginning in 1969, the ARPANET provided a test-bed for networking research and development. An important development that grew out of ARPANET was the TCP/IP protocols, which provided standard rules for networked computers to communicate with each other.

Other significant events included the introduction of the desktop computer, the development of networking tools such as

telnet, FTP, gopher and WWW, and the release of graphical browsers. Advancements in networking enabled the NSFNET to upgrade its speed several times, allowing more and more connections.

1960's

1969-The Department of Defence Advanced Research Organization (ARPA) creates an experimental network called ARPANET. This network provides a test –bed for emerging network technologies.

ARPANET originally connected four universities and enabled scientists to share information and resources across long distances ARPANET continued to expand, connecting many more sites throughout the 1970's and 1980's.

1970's

Networking tools are developed in the 1970's including:

1972-The National Center for Supercomputing Applications (NASA) develops the telnet application for remote login.

1973-FTP (file transfer protocol) is introduced.

1980's

Several significant events occurred in 1983, including:

The TCP/IP suite of networking protocols, or rules, becomes the only set of protocols on the ARPANET. This decision sets a standard for other networks, and generates the use of the term 'Internet' as the network of networks which use the TCP/IP protocols or are able to interact with TCP/IP.

1982-1983:

The first desktop computers begin to appear. Many are equipped with an operating system called Berkeley UNIX, which includes networking software. This allows for relatively easy connection to the Internet using telnet.

1985-86:

The National Science Foundation (NFS) connects the nation's six supercomputing centers together. This network is called the NSFNET, of NSFNET backbone.

1990- The APRANET is dissolved.

1991:

Gopher is developed at the University of Minnesota. Gopher provides a hierarchical, menu –based method for providing and locating information on the Internet. This tool makes using the Internet much easier.

1993:

The European Laboratory for Particle Physics in Switzerland (CERN) releases the World Wide Web (WWW), developed by Tim Berners-Lee. The WWW uses hypertext protocol (HTTP) and hypertext links, changing the way information can be organized.

1995:

The NSFNET backbone is replaced by a new network architecture, called vBNS (very high speed backbone network system) that utilizes Network Service Providers, regional networks and Network Access Points (NAPs).

### 13.3.2 Client - Server

Establishing the right kind of network for your organization is important to make the most of your time and money. While Peer to Peer Networking is often a good choice for small networks, in an environment with more than 10-15 computers, a peer –to-peer network begins to become more trouble than it is worth: your computers start to slow down, you can never find the file you are looking for, and security is non-existent. If this is happening in your organization, it is probably time to switch to a client-server network by bringing in a dedicated server to handle the load.

Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request.

**Client**

In client/server architecture, client is a computer or process that request from a server. It is often an application that uses a

graphical user interface. Each instance of the client software can send requests to a server.

Characteristics of a client:

In client/server architecture client is an active (master) computer or process.

Client sends requests to server.

Client waits for and receives server replies.

Types of client

Clients are generally classified in these types:

Fat clients

Thin clients

Hybrid clients.

**Server**

In client/server architecture, a server is simply a computer that is running software that enables it to serve specific requests from other computers, called “client”. For example you can set up a file server that becomes a central storage place for your network, a print server that takes in print jobs and ships them off to a printer, as well as a multitude of other servers and server functions.

Characteristics of a server:

In client/server architecture server is a passive (slave) computer or process.

Server waits for requests.

Upon receipt of requests, server processes them and then replies.

A server provides many benefits including;

Optimization: server hardware is designed to serve requests from clients quickly

Centralization: files are in one location for easy administration

Security : multiple levels of permissions can prevent users from doing damage to files

Redundancy and Back-up: data can be stored in redundant ways making for quick restore in case of problems

A server, like any computer, consists of two parts, the hardware and the software.

### 13.3.3 TCP/IP

TCP/IP stands for Transmission Control Protocol/ Internet Protocol.

It works much like a piece of registered mail. You pack your valuable information-take it to the Post Office-they find the most efficient way to deliver it – send the package –get a signature stating that the item was received –return a message so that you are assured that the package arrived intact.

TCP/IP protocols break up the data into small segments called packets (this help with the transportation over the internet), sends the address of where the information is to be sent, send the information, verify the receipt of information and reconstruct the data on the other end.

IP-is responsible for moving packet of data from node to node. IP forwards each packet based on a four byte destination address (the IP number). The Internet authorities assign ranges of numbers to different organizations. The organizations assign groups of their numbers to departments. IP operates on gateway machines that move data from department to organization to region and then around the world.

TCP- is responsible for verifying the correct delivery of data from client to server. Data can be lost in the intermediate network. TCP adds supports to detect errors or lost data and to trigger retransmission until the data is correctly and completely received. Sockets-is a name given to the package of subroutines that provide access to TCP/IP on most system.



**CHECK YOUR PROGRESS**

**Q 2:** Define TCP/IP.

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## 13.4 IT INFRASTRUCTURE

**Information technology**

IT (information technology) is a term that encompasses all forms of technology used to create, store, exchange, and use information in its various business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms.

It's a convenient term for including both telephony and computer technology in the same work. IT transforms existing organizations and enables new kinds of businesses to form.

E –commerce needs to be considered as strategic information system because it enhances competitiveness through the computer based information system.

**Information technology infrastructure**

An organization's information technology infrastructure is the base or foundation for the delivery of information to support the organization's programs and management. The infrastructure contains elements upon which an organization's information technology activities are dependent. An organization must therefore define, implement and manage these infrastructure elements to successfully employ information technology. IT infrastructure includes elements owned by the organization and available under contract or through inters organization agreement e.g. the required data center resources are considered part of the organization's infrastructure.

### 13.4.1 Characteristics of IT Infrastructure

The desirable characteristics of IT infrastructure are:

- Efficient support for the exchange of information within the organization and with other organizations.
- Reliable availability of information processing capabilities whenever and wherever they are needed.
- Preservation of the integrity and confidentiality of information maintained by the organization.

- Sufficient flexibility to allow the timely and efficient addition of new information management capabilities and modifications of established capabilities.
- Consistency with a coherent set of technical and managerial standards for the employment of information technology.

### 13.4.2 Elements of IT Infrastructure

Typical elements in an IT infrastructure include:

- **Application Systems:** The applications that an organization purchases and/ or develops to achieve personal productivity and program support benefits.
- **Architecture**: The guidelines or blueprints that an organization follows in designing, acquiring and implementing information technology solutions.
- **Communications:** Local area and wide area network components, including linkages with other organizations.
- **Equipment:** An organization's hardware platforms and components ranging from individual personal computers to mainframes and associated peripherals.
- **Facilities:** The electrical, ventilation, fire suppression, physical security, wiring and other components required to support an organization's information technology capability including the physical structure itself.
- **Partnerships:** Relationships with other public and private sector organizations that support and enable the organization's pursuit and use of information technology.
- **People:** An organization's technical staff, user community groups and executive steering and oversight committees that are charged with information technology planning approval development, operations and security responsibilities.
- **Plans:** Detailed designs or methods for aligning information technology activities with organization business strategies and accomplishing business objectives e.g. strategic, risk management and operational recovery.

- **Policies:** The rules, conventions and protocols adopted by the organization to govern the pursuit and use of information technology.
- **Processes and Procedures:** The defined steps for planning, approving, acquiring, developing, operating, maintaining, enhancing and using information technology within the organization.
- **Service Definitions:** The types of services provided, accepted service levels and service delivery time frames established for an organization's information technology support organization.
- **Software:** The set of operating system, utility, communications, user interface and management programs that enable users to operate and control computers and develop application systems.
- **Reengineering the Business Process:** The search for, and implementation of, radical changes in business processes that result in dramatic efficiencies, reductions in turnaround time, improvements in quality or improvement in customer service.



**CHECK YOUR PROGRESS**

**Q 3:** Explain the various characteristics of IT infrastructure.

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## 13.5 MIDDLEWARE

The term middleware is used to describe separate products that serve as glue between two applications for example; there are a number of middleware products that link a database system to a Web server.

This technology has evolved during the 1990s to provide for interoperability in support of the move to client/server architectures. It hides the complexity of the extra functionality that client server processes can invoke.

Some middleware services are:

**Remote data access (RDA):** It provides SQL access to server-based DBMS.

**Remote procedure calls (RPC):** it provides invocation of remote (e.g. server based) procedures.

**Message –oriented middleware:** It provides store-and-forward message queuing between application processes (e.g. Microsoft MAPI-based applications).

**Object request brokers (ORB):** It provides invocation of remote (e.g. server-based) objects by simply sending a message to it.

**Distributed transaction Processing:** It provides invocation of remote transactions with transactional ('all or nothing') execution.



**CHECK YOUR PROGRESS**

**Q 4:** What is middleware? Explain various services of middleware.

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## 13.6 CONTENTS: INTEGRATING TEXT AND E-BUSINESS APPLICATIONS

Now you know that most of the e-business applications are supported by web. In this new business environment, contents will play an important role in attracting customers and developing the business. Therefore, content for the e-business applications should be relevant to the requirement and in interesting form. For this purpose one would require to support variety of contents as text, audio, still images, video, and graphics etc. Over Internet, contents are published in the form of hypertext of hypermedia.

### 13.6.1 Hypertext

Hypertext consists of text components that can be rearranged by the reader or read in a nonlinear or multi linear manner. Normally

it takes the form of text sections-known as nodes or (on the Web) pages-linked in complex networked structures rather than in the hierarchical arrangements found on typical Web sites. Since any one node can be linked to many others, different readers can follow different routes through the same work. The term was coined by Ted Nelson around 1965.

### 13.6.2 Hypermedia

Hypermedia is a term used for hypertext, which is not constrained to be text: it can include graphics, video and sound. Apparently Ted Nelson was the first to use this term too.

Some technologies used to implement hypertext and hypermedia are:

HTML

HTML stands for Hypertext Markup Language. It consists of standardized codes, or 'tags', that are used to define the structure of information on a web page. It is used to prepare documents for the World Wide Web. A web page is a single unit of information, often called a document that is available on the World Wide Web.

HTML defines several aspects of a web page including heading levels, bold, italics, images, paragraph breaks and hypertext links to other resources.

HTML can be compared to word processing. The text in a word processed file can be formatted in various ways. For example, a heading can be bold and in larger font size than the rest of the document. Also, specific words can be italicized for emphasis. HTML is a way to define the formats of text in a web page. However, it goes further by also being able to define placement of graphics and hypertext links.

HTML is a sub-language of SGML (Standard Generalized Markup Language). SGML is a system that defines and standardizes the structure of documents.

Both SGML and HTML utilize descriptive markup to define the structure of an area of text. In general terms, descriptive markup does not specify a particular font or point size for an area of text. Instead, it describes an area of text as a heading or a caption, for example. Therefore, in HTML text is marked as a heading, subheading, numbered list, bold, italic, etc.

HTML Is standardized and portable. A document that has been prepared using HTML markup “tags” can be viewed using a variety of web browsers. A browser interprets the tags in a HTML file and presents the file as a formatted, readable web page. In addition, HTML documents can be viewed on all types of systems such as Macintosh, PC, and UNIX machines.

HTML tags are used to define areas of a document as having certain characteristics.

The tags used in HTML usually consists of a code in between two “wickets”. These codes are called container tags because the formatting described by the tags affects only the text contained between the tags.

### 13.6.3 HTTP

HTTP is short for Hypertext Transfer Protocol. It is the set of rules, or protocol, that governs the transfer of hypertext between two or more computers. The World Wide Web encompasses the universe of information that is available via HTTP.

It is based on the client/server principle.

HTTP allows “computer A” (the client) to establish a connection to “computer B” (the server) and make a request. The server accepts the connection initiated by the client and sends back a response. An HTTP request identifies the resource that the client is interested in and tells the server what “action” to take on the resource.



## 13.7 LET US SUM UP

In this unit we have discussed the following aspects –

- Internet is a network of networks i.e. is a group of two or more networks that are interconnected physically and capable of communicating, sharing data with each other and able to act together as a single network.
- The Internet has evolved through a series of advancements in networking and computer technologies
- Client/server describes the relationship between two computer programs.
- In client/server architecture, client is a computer or process that request from a server. It is often an application that uses a graphical user interface.
- TCP/IP is a set of protocols that handles data transmitted across the internet.
- In client/server architecture, a server is simply a computer that is running software that enables it to serve specific requests from other computers, called “client”.
- IT is a term that encompasses all forms of technology used to create, store, exchange, and use information in its various business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms.
- The term ‘middleware’ is used to describe separate products that serve as glue between two applications for example; there are a number of middleware products that link a database system to a Web server.
- Hypertext consists of text components that can be rearranged by the reader or read in a nonlinear or multi linear manner.
- Hypermedia is a term used for hypertext, which is not constrained to be text: it can include graphics, video and sound.
- HTML stands for Hypertext Markup Language.
- HTTP is the set of rules, or protocol that governs the transfer of hypertext between two or more computers.



## 13.8 FURTHER READING

1. Ravi Kalkota and Andrew B. Whinston(); *Electronic commerce, A manager's guide*, Pearson Education.
2. David Whiteley(), *E-Commerce, Strategy, Technologies and Applications* , Tata Megraw-hill.
3. US Pandy, Rahul Srivastava, Saurabh Shukla,(); *E-commerce and its Applications*, S. Chand & Company Ltd.
4. V. Rajaraman(); *Essentials of E-commerce Technology*,PHI
5. Ritendra Goel(); *E-commerce*,New age international publishers.



## 13.9 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q No 1:** Internet is a network of networks i.e. is a group of two or more networks that are interconnected physically and capable of communicating, sharing data with each other and able to act together as a single network.

**Ans to Q No 2:** TCP/IP stands for Transmission Control Protocol/ Internet Protocol.

It works much like a piece of registered mail. You pack your valuable information-take it to the Post Office-they find the most efficient way to deliver it – send the package –get a signature stating that the item was received –return a message so that you are assured that the package arrived intact.

TCP/IP protocols break up the data into small segments called packets (this help with the transportation over the internet), sends the address of where the information is to be sent, send the information, verify the receipt of information and reconstruct the data on the other end.

**Ans to Q No 3:** The desirable characteristics of IT infrastructure are:

Efficient support for the exchange of information within the organization and with other organizations.

Reliable availability of information processing capabilities whenever and wherever they are needed.

Preservation of the integrity and confidentiality of information maintained by the organization.

Sufficient flexibility to allow the timely and efficient addition of new information management capabilities and modifications of established capabilities.

Consistency with a coherent set of technical and managerial standards for the employment of information technology.

**Ans to Q No 4:** The term middleware is used to describe separate products that serve as glue between two applications for example; there are a number of middleware products that link a database system to a Web server.

Some middleware services are:

Remote data access (RDA): It provides SQL access to server-based DBMS

Remote procedure calls (RPC): it provides invocation of remote (e.g. server based ) procedures

Message– oriented middleware: It provides store-and-forward message queuing between application processes (e.g. Microsoft MAPI-based applications)

Object request brokers (ORB): It provides invocation of remote (e.g. server-based) objects by simply sending a message to it

Distributed transaction Processing: It provides invocation of remote transactions with transactional (‘all or nothing’) execution.



## 13.10 MODEL QUESTIONS

**Q 1:** Explain E-business applications.

**Q 2:** Differentiate between HTML and HTTP.

**Q 3:** Discuss the elements of IT infrastructure.

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# UNIT 14: PAYMENT THROUGH INTERNET

## UNIT STRUCTURE


14.1 Learning Objectives

14.2 Introduction

14.3 Online Payment Mechanism

14.4 Electronic Payment System (EPS)

- 14.4.1 Credit Card Payment
- 14.4.2 Electronic Fund Transfer
- 14.4.3 Electronic Cheque Payment
- 14.4.4 Electronic Cash

14.5 Payment Gateways

14.6 Visitors/Audience to Website

14.7 Plastic Money

14.8 Electronic Payment Security

14.9 Let Us Sum Up

14.10 Further Reading

14.11 Answers to Check Your Progress

14.12 Model Questions


## 14.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

- explain the online payment mechanism
- describe the electronic payment system
- describe the procedure of Credit Card payment
- explain the electronic fund transfer
- discuss the electronic cheque payment
- define electronic cash
- define payment gateways
- define visitors to website
- define plastic money
- explain the electronic payment security.

## 14.2 INTRODUCTION

In e-commerce just as in normal commerce it is necessary for persons/organizations availing of goods and services to pay for them. In all three forms of e-commerce, namely, B2C, B2B and C2C we need appropriate schemes of payment. In day-to-day commercial dealings there are primarily three modes of payment. The most common payment scheme between individual customers and merchants is cash, particularly for small value purchases. For larger value purchases usually a credit/debit card is the one accepted by most merchants. If you have a trusted relationship with a merchant he would normally accept cheque payment. In commercial dealings between businesses either cheque payments or instructions to transfer amount due electronically (through Electronic Funds Transfer or Electronic Clearing System) is employed. The most common payment scheme in B2C e-commerce is by using credit cards. For small value transactions, less than Rs.100, one would prefer cash payment. There are systems to mimic cash payment using Internet. There are several features of physical cash payment such as anonymity and zero transaction cost which are difficult to mimic in e-cash. Thus, what is available as e-cash is almost like cash but not identical to it.

## 14.3 ONLINE PAYMENT MECHANISM

For online shopping, almost everyone loves the convenience of online payments rather than the burdensome task of mailing funds for a purchase. As a business owner, you also can experience a huge decrease in the time it takes to get your funds into your hands.

In order for payment processing to work successfully, multiple entities have to be working in a coordinated or compatible system. Here are some of the entities involved.

- Customer gateway
- Bank clearinghouse
- Merchant

**Online banking-** Online banking (or Internet banking )is a term used for performing transactions, payments etc. over the Internet through a bank,

credit union or building society's secure website. This allows customers to do their banking outside of bank hours and from anywhere where internet access is available. In most cases a web browser is utilized and anywhere where Internet access is available. In most cases a web browser is utilized and any normal internet connection is suitable. No special software or hardware is usually and any normal internet connection is suitable. No special software or hardware is usually needed.

Online banking usually offers such features as:

– Bank statements, with the possibility to import data in a personal finance program such as Quicken or Microsoft Money
– Electronic bill payment
– Funds transfer between a customer's own checking and saving accounts or to another customer's account
– Investment purchase or sale
– Loan application and transactions, such as repayments

Account aggregation to allow the customers to monitor all of their accounts in one place whether they are with their main bank or with other institutions.

There is a growing numbers of banks that operate exclusively online. Because these online banks have low costs compared to traditional banks they can offer high interest rates.

Through online banking, different branches of a can be interconnected. This feature is known as CBS.

**Core Banking Solution (CBS)-** Core Banking Solution (CBS) is networking of branches, which enables Customers to operate their accounts, and avail banking services from any branch of the Bank on CBS network, regardless of where he maintains his account. The customer is no more the customer of a Branch. He becomes the Bank's Customer. Thus CBS is a step towards enhancing customer convenience through Anytime Banking.

**Advantages of CBS**

All CBS branches are inter-connected with each other. Therefore, customers of CBS branches can avail various banking facilities from any

other CBS branch located any where in the world. These services are:

- To make enquiries about the balance; debit or credit entries in the account.
- To obtain cash payment out of his account by tendering a cheque.
- To deposit a cheque for credit into his account.
- To deposit cash into the account.
- To deposit cheques/cash into the account of some other person who has account in a CBS branch.
- To get statement of account.
- To transfer funds from his account to some other account-his own or of third party, provided both accounts are in CBS branches.
- To obtain Demand Drafts or Banker's Cheques from any branch on CBS-amount shall be online debited to his account.
- Customers can continue to use ATMs and other Delivery Channels, which are also interfaced with CBS platform. Similarly, facilities like Bill Payment, I-Bob, M-bob etc. shall also continue to be available.
- Internet banking facility.

The aim of all these services is to provide convenient, efficient, and high quality banking experience to the customers, comparable to world-class standards.

CBS provides some other benefits also. These are:

- Improves the quality and efficiency of the services.
- Provides convenient and delightful banking.



**CHECK YOUR PROGRESS**

**Q 1:** What is meant by online payment mechanism?

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## 14.4 ELECTRONIC PAYMENT SYSTEM (EPS)

Electronic payment systems are online payment systems. The goal

of their development is to create analogs of checks and cash on the Internet.

These days, mobile ATM is also an area of focus. Banks are opening such mobile ATMs which double as mobile branches besides offering customers the facility of using their debit/ATM cards as the ATMs are installed in mobile vans.

Features of EPS

An EPS implements all or some of the following features:

1. Protecting customers from merchant's fraud by keeping credit card numbers unknown to merchants.
2. Allowing people without credit cards to engage in online transactions.
3. Protecting confidentiality of customers.
4. In some cases providing anonymity of customers ("electronic cash").

**Advantages of Electronic Payment System**

The various factors that have lead the financial institutions to make use of electronic payments are:

1. Decreasing technology cost: The technology used in the networks is decreasing day by day, which is evident from the fact that computers are now dirt –cheap and Internet is becoming free almost everywhere in the world.
2. Reduced operational and processing cost: Due to reduced technology cost the processing cost of various commerce activities becomes very less e.g. in electronic transactions we save both paper and time.
3. Increasing online commerce: The above two factors have lead many institutions to go online and many others are following them.



**CHECK YOUR PROGRESS**

**Q 2:** Explain the electronic payment system.

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### 14.4.1 Credit Card Payment

There are many other steps involved before a credit card payment is complete. There are two systems which can be used.

One is a simple system in which the credit card number is exposed to a merchant and the privacy of purchases made by a client is not ensured. The other system is complicated in which the credit card number is not exposed to the merchant and the privacy of purchases is also ensured. The second method is more complicated and requires a customer to have a public key certificate which many casual customers may not have. This method, however, ensures that the credit card number is not exposed to a merchant and the privacy of transactions is ensured. There are four parties involved in credit card transactions. They are:

1. A customer who owns a credit card.
2. A merchant who accepts credit cards (typically a merchant would accepts credit cards of several companies such as Visa, Master card, etc.)
3. A bank which issues credit cards to customers, guarantees payment to merchants and collects bills from its customers.
4. An acquirer which is normally another bank which establishes an account with a merchant validates card information presented by a merchant and approves sales bases on a customer's credit status. The acquirer accepts cards of several credit card companies, transfers payment to merchant's account when it approves a sale and gets reimbursed by the issuing bank. The acquirer normally charges a commission of around 2% on each sale from the merchant. The customer's bank collects an annual fee from its customer and also a large monthly interest on outstanding overdue payments. Monthly interest may range from 1.5 to 3% on overdue bills.

### 14.4.2 Electronic Funds Transfer

Before describing cheques payment in e-commerce it is necessary to describe a scheme called Electronic Funds Transfer (EFT) which is an essential part of clearing cheques in a banking system. What is meant by clearing a cheque? If A issues a cheque

favouring B, it will be written on a cheque in bank A's bank (say X). B will deposit the cheque in his or her bank (say Y). before B's account in bank Y can be credited, Y should check with A's bank X whether A has enough money in his or her account. If X approves then A's account in bank X will be debited and B's account in bank Y will be credited. This process of cheques clearance has been automated and is called Electronic Funds Transfer. In order to implement electronic funds transfer, the following requirements have to be met:

- An Automated Clearing House (ACH) should work as an intermediary to negotiate transfer of funds when cheques are used. In India, the Reserve Bank of India (RBI) acts as the ACH.
- All banks should use ACH and become its members. RBI is the controlling agency of all banks in India.
- There should be a secure electronic communication channel between each bank and the ACH. As the amounts involved are very large, normally these channels are private secure leased lines.

There are two models of EFT. The first one *is Automated Cheque Clearance* where physical cheques are transported and the second a variation called *Electronic clearing Service (ECS*) where no physical cheques are transported.



**CHECK YOUR PROGRESS**

**Q 3:** Explain electronic fund transfer.

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### 14.4.3 Electronic Cheque Payment

In B2B e-commerce the purchaser and the vendor normally have mutual trust before negotiating a purchase. The amounts involved is also quite large. Thus, payments are normally made by cheque. Thus we have to find an electronic equivalent of a physical cheque and payment scheme to mimic the manual scheme. We

thus need banks and ACH to accept electronic cheques in addition to physical cheques. Assuming this condition is satisfied we will describe a method.

Before electronic cheques payment system is implemented, the following conditions must be satisfied:

1. Both businesses must have certified public keys and must be able to digitally sign e-cheques. In India every registered company (Private or Public limited) must have a public key certificate and must be able to digitally sign documents. Income Tax department accepts only e-returns and electronic payments of tax due from all companies.
2. All banks and ACH must have public key certificates and must be able to digitally sign documents using a common agreed hash function.

There are five parties involved in the transaction.

1. Purchaser –P
2. Vendor-V
3. Purchaser's bank-PB
4. Vendor's bank-VB
5. Automated clearing house-ACH

One format for e- cheque is given below which contains all the essential information.

Format of e-cheque sent by purchaser (payer)

Unique id of e-cheque

Date of cheque

Payee's id and name

Amount to be paid

Payer's bank code

Payer's account number

Digital signature of payer

### 14.4.4 Electronic Cash

The cost of each transaction when a credit card or a cheque

is used is high. It is estimated that each transaction costs at least five rupees. Thus, it is not appropriate for low value transactions, e.g., less than two hundred rupees. We normally use cash for such transactions. The major advantages of cash are:

- It is legal tender and its value is guaranteed in the short range. Inflation causes loss of value but is normally controlled by governments.
- It is universally accepted in exchange of goods and services without the intervention of third parties such as banks. A merchant who accepts cash can use it for buying goods and services without the intervention of the Reserve Bank of India.
- It is easy to carry around.
- It is anonymous. A merchant cannot say who gave a particular currency note.
- Privacy of transaction is ensured due to anonymity.
- Currency notes are breakable into smaller denominations. For example, if you buy an item for Rs.44 and give Rs.100 currency note to a merchant, he or she will return Rs.56.

The major disadvantages of cash are:

- It is not safe. If cash is lost one would be lucky to get it back.
- It is bulk in proportion to the amount.

## 14.5 PAYMENT GATEWAY

A payment gateway is a separate service and acts as an intermediary between the merchants' shopping cart and all the financial networks involved with the transaction, including the customers' credit card issuer and your merchant account. It checks for validity, encrypts transaction details, ensures they are sent to the correct destination and then decrypts the responses which are sent back to the shopping cart. A payment gateway can be thought of as a digital equivalent to a credit card processing terminal.

This is a seamless process and your customer does not directly interact with the gateway; as data is forwarded to the gateway via your shopping cart and a secure (SSL) connection. The shopping cart is configured via plugins

to sent information that is acceptable to the particular gateway.

How payment gateways work- Payment gateways encrypt information handled through SSL (Secure socket layer). This prevents opportunity for fraud, and adds security to the transaction process. Gateways communicate with a variety of entities, including:

- The customer
- The merchant (through their website)
- Credit Card companies (by verifying information)
- Internet Merchant accounts that relay order information from the gateway to the merchant's bank account.

**Benefits of payment gateway**-

benefits of having a payment gateway are:

1. Security: Gateways keep customers credit card data behind firewalls so that the merchant doesn't have to worry about someone "hacking in" to their system.
2. Encryption: Gateways use SSL encryption to prevent message tampering while the credit card information is being transmitted over the Internet. EMS provides the most secure encryption technology.
3. Back-up redundancy: Gateways have a backup system in place to ensure that merchants can continue processing in the event of an emergency
4. Up-to-date technology: Gateways are services that are constantly upgraded to be up to date with the latest technology. And, because the gateways are not on merchants' computers, there is no need for the merchants to upgrade their hardware. Gateways save the cost of an additional phone line that would be needed in a dial application.



**CHECK YOUR PROGRESS**

**Q 4:** How payment gateways work? What are the benefits of payment gateway?

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## 14.6 VISITORS/AUDIENCE TO WEBSITE

In addition to defining the purpose of your site, you also need to determine who your target audience/visitor will be. What kind of people do you want to attract? Kids? College student? Lawyers? Doctors? House wives?

Before building a web site, make sure to answer some simple audience questions?

- Are they young or old ?
- Are the users coming from within your organization or from outside?
- When do they visit the website?
- How frequently they can visit the web site?
- What browsers do they use?
- What technology do they use?
- What kind of professionals they are?
- How much level of computer knowledge they possess?

Now you might wonder why it is so important to determine exactly who is going to view your site. Let's take an example if you are designing a site for a corporate, then they probably have latest PCs with all latest software. This may also be true if you're building a site for family and friends. You won't be too concerned about else seeing it, and you'll have a little more freedom with the design.

However, if you are building a web site for a much broader audience, like portals (www.indiatimes.com) you'll want to be a little more sensitive about the "special effects" that you use on your site because what may work on your updated browser/PC, may not be properly displayed on someone else's. There's nothing worse than having a business site filled with all the new web technology, and then discovering over half of your audience cannot view your site because their PCs and/or browsers are not as up to date as yours.

## 14.7 PLASTIC MONEY

Plastic money is a term that is used predominantly in reference to the hard plastic cards we use everyday in place of actual bank notes. They can come in many different forms such as cash cards, credit cards, debit

cards, pre-paid cash cards and store cards.

**Cash cards-** A card that will allow you to withdraw money directly from your bank via an Automated Teller Machine (ATM) but it will not allow the holder to purchase anything directly with it.

**Credit cards**- Again this card will permit the card holder to withdraw cash from an ATM, and a credit card will allow the user to purchase goods and services directly, but unlike a cash card the money is basically a high interest loan to the card holder, although the card holder can avoid any interest charges by paying the balance due in full each month.

**Debit cards**- This type of card will directly debit money from your bank account and can directly be used to purchase goods and services. While there is not official credit facility with debit cards, as it is linked to the bank account the limit is the limit of what is in the account, for instance if an overdraft facility is available then the limit will be the extent of the overdraft.

**Pre- paid cash cards**- As the name suggests the user will add credit to the card themselves, and will not exceed the amount. These are usually re-useable in that they can be 'Topped up' however some cards, usually marketed as gift Cards are not re-useable and once the credit has been spent they are disposed of.

**Store Cards**- These are similar in concept to the credit card model, in that the idea is to purchase something in store and be billed for it at the end of the month. These cards can be charged at a very high interest rate and can limited in the places they can be used, sometimes as far as only the store brand that issued it.

## 14.8 ELECTRONIC PAYMENT SECURITY

The well-known security problems of traditional payment systems are as follows:

- Money can be counterfeited.
- Signatures can be forged.
- Cheques can bounce.

Electronic payment systems have the same problems as traditional systems, and more:

- Digital documents can be copied perfectly and arbitrarily often.
- Digital signatures can be produced by anybody who knows the private key.
- A payer's identity can be associated with every payment transaction.

Obviously, without additional security measures, widespread e-commerce is not viable. A properly-designed electronic payment system can, however, provide better security than traditional payment systems, in addition to flexibility of use.

Generally, in an electronic payment system, three types of adversaries can be encountered:

1. Outsiders eavesdropping on the communication line and misusing the collected data (e.g., credit card numbers)
2. Active attackers sending forged messages to authorized payment system participants in order to prevent the system from functioning or to steal the assets exchanged (e.g., goods, money).
3. Dishonest payment system participants trying to obtain and misuse payment transaction data that they are not authorized to see or use.

The basic security requirements for electronic payment systems can be summarized as follows:

- Payment authentication.
- Payment integrity.
- Payment authorization.
- Payment confidentiality.

**Payment authentication** implies that both payers and payees must prove their payment identities, which are not necessarily identical to their true identities. If no anonymity is required, any authentication mechanisms may be used to satisfy this requirement. Authentication does not necessarily imply that payer's identity is revealed. If anonymity is required, some special authentication mechanisms are needed.

**Payment integrity** requires that payment transaction data cannot be modifiable by unauthorized principals. Payment transaction data includes the payer's identity, the payee's identity, the content of the purchase, the amount, and possibly other information. For this purpose an integrity

mechanism from the area of information security may be employed.

**Payment authorization** ensures that no money can be taken from a customer's account or smart card without his explicit permission. It also means Electronic Payment Systems require that the explicitly allowed amount can be withdrawn by the authorized principal only. This requirement is related to access control.

**Payment confidentiality** covers confidentiality of one or more pieces of payment transaction data. In the simplest case it can be achieved by using one of the communication confidentiality mechanisms. In some cases, however, it is required that different pieces of the transaction data be kept secret from different payment system participants. Such requirements can be satisfied by certain specially tailored payment security mechanisms.



## 14.9 LET US SUM UP

In this unit we have discussed the following aspects–

- Online shopping could be defined as the buying and selling of goods over the internet.
- An electronic token is a digital analog of various forms of payment backed by a bank or financial institution .
- Through online banking, different branches of a can be interconnected.
- Before describing cheques payment in e-commerce it is necessary to describe a scheme called Electronic Funds Transfer (EFT) which is an essential part of clearing cheques in a banking system .
- Plastic money is a term that is used predominantly in reference to the hard plastic cards we use every day in place of actual bank notes. They can come in many different forms such as cash cards, credit cards, debit cards, pre-paid cash cards and store cards.
- The basic security requirements for electronic payment systems.



## 14.10 FURTHER READING

1. V. Rajaraman(); Essentials of E-commerce Technology, PHI
2. Ritendra Goel(); E-commerce, New age international publishers.
3. Harvey M. Deitel, Paul J. Deitel, Kate Steinbuhler (); E-Business and E-commerce for manager's, Pearson.



## 14.11 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q No 1:** Electronic payment systems are online payment systems. The goal of their development is to create analogs of checks and cash on the Internet.

These days, mobile ATM is also an area of focus. Banks are opening such mobile ATMs which double as mobile branches besides offering customers the facility of using their debit/ATM cards as the ATMs are installed in mobile vans.

**Ans to Q No 2:** In order for payment processing to work successfully, multiple entities have to be work in a coordinated or compatible system. Some of the entities involved are-

- Customer gateway
- Bank clearinghouse
- Merchant

**Ans to Q No 3:** Electronic Funds Transfer (EFT) is an essential part of clearing cheques in a banking system. In order to implement electronic funds transfer, the following requirements have to be met:

- An Automated Clearing House (ACH) should work as an intermediary to negotiate transfer of funds when cheques are used. In India, the Reserve Bank of India (RBI) acts as the ACH.
- All banks should use ACH and become its members. RBI is the controlling agency of all banks in India.

- There should be a secure electronic communication channel between each bank and the ACH. As the amounts involved are very large, normally these channels are private secure leased lines. There are two models of EFT. The first one *is Automated Cheque Clearance* where physical cheques are transported and the second a variation called *Electronic Clearing Service (ECS*) where no physical cheques are transported

**Ans to Q No 4:** A payment gateway is a separate service and acts as an intermediary between the merchants' shopping cart and all the financial networks involved with the transaction, including the customers' credit card issuer and your merchant account. It checks for validity, encrypts transaction details, ensures they are sent to the correct destination and then decrypts the responses which are sent back to the shopping cart.

Benefits of payment gateway-

1. Security: Gateways keep customers credit card data behind firewalls so that the merchant doesn't have to worry about someone "hacking in" to their system.
2. Encryption: Gateways use SSL encryption to prevent message tampering while the credit card information is being transmitted over the Internet. EMS provides the most secure encryption technology.



## 14.12 MODEL QUESTIONS

**Q 1:** Explain various features and advantages of electronic payment system.

**Q 2:** What is plastic money ?

**Q 3:** Write short notes on:

(i) Electronic cash (iii) Store cards

(ii) Credit card (iv) CBS

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# UNIT 15: CYBER CRIMES

## UNIT STRUCTURE


15.1 Learning Objectives

15.2 Introduction

15.3 Cyber Crime

15.4 Hacking

15.5 Digital Forgery

15.6 Identity Theft

15. 7 Cyber Stalking

15.8 Cyber Terrorism

15.9 Cyber Defamation

15.10 Software Piracy

15.11 Information Technology Act, 2000

15.12 Let Us Sum Up

15.13 Further Reading

15.14 Answers to Check Your Progress

15.15 Model Questions


## 15.1 LEARNING OBJECTIVES

After going through this unit you will be able to:

- learn what constitutes cyber crime
- describe hacking, digital forgery, cyber stalking
- define identity theft, cyber terrorism and defamation
- learn about different types of software piracy
- describe different offences under IT Act 2000

## 15.2 INTRODUCTION

In the present unit you will be introduced to the concepts of cyber crime and how cyber crimes are committed against individuals, institutions and state. Different cyber crimes like hacking, digital forgery, cyber stalking, and cyber terrorism are some of the cyber crimes introduced in this unit. The IT Act 2000 which criminalizes cyber crime is also included in this unit.

You will be made familiar with the different cyber crimes and laws against cyber crime in this unit.

## 15.3 CYBER CRIME

Computers have become an essential part of our life. And along with the widespread growth of computers, internet use is also expanding. Although the use of internet and technology has made the life of people easier, it has also given rise to a new type of crime - cyber crime. The term cyberspace is used to represent the electronic medium of computer networks, in which online communication takes place. This term not only represents the internet but also includes computers, computer networks, the internet, data, software etc. Cyber crime can be defined as any crime that is performed using a computer and network either as a tool or as a target. Cyber crimes are often referred to as computer crimes.

Cyber crime can also be defined as "Offences that are committed against individuals or groups of individuals with a criminal motive to intentionally harm the reputation of the victim or cause physical or mental harm, or loss, to the victim directly or indirectly, using modern telecommunication networks such as Internet (Chat rooms, emails, notice boards and groups) and mobile phones (SMS/MMS)"[1].

Some of the common cyber crimes are mentioned below :

- computer hacking
- digital forgery
- cyber stalking
- identity theft
- identity fraud
- cyber terrorism
- cyber defamation
- software piracy
- cyber pornography
- cyber bullying
- unwarranted cyber surveillance
- cyber warfare

We will look at some of these cyber crimes in detail in the next few sections.

Cyber crimes are generally divided into two categories depending on the use or activity of the computer. In the first category, the computer is the target of the cyber crime. Some examples of this category of cyber crime include hacking, virus attacks and denial of service attacks. In the second category, the computer is the tool used to perform the cyber crime. Some examples of this category include cyber frauds, cyber stalking and cyber terrorism.

Cyber crimes can also be divided into different categories depending on the target of the crime. The cyber crime performed can be committed against an individual, an institution or against a state. An example of cyber crime committed against an individual can be cyber stalking. Similarly, an example of cyber crime committed against an institution can be hacking their websites. And an example of cyber crime committed against a state is cyber terrorism or cyber warfare.

## 15.4 HACKING

Hacking is one of the most common cyber crimes. It can be defined as an illegal intrusion into a computer system or network. This is a type of crime where an individual or institution's computer is broken into so that personal or sensitive information can be accessed. The act that is committed towards breaking into a computer system or network is known as hacking.

The person who performs the act of hacking is known as a hacker. The hacker tries to find the vulnerabilities in a person's or institutions computer system or passwords to exploit the weakness and gain access into the system. The hackers are usually highly skilled computer professions. Depending on the intent of the hackers, the hackers are classified into different groups.

The first category of hackers is ethical hackers. Ethical hackers are persons who hack into the computer system with an aim to identify the weaknesses present in the system and not for any personal gain. Because of this they are also called white hat hackers. Mostly, ethical hackers hack

into computer systems on a request from the organization itself to test vulnerabilities present in the system.

The second category of hackers are crackers. Crackers are persons who hack into the computer system with an aim to gain unauthorized access to the system or network for personal gain. They aim to steal sometimes sensitive and important personal data, or corporate data or bank information. Both types of hackers use a variety of software to enter a person's computer. Most of the victims are sometimes not even aware that they had been hacked.

## 15.5 DIGITAL FORGERY

Digital forgery is the digitization of the process of forgery. Forgery in traditional systems is the crime of falsely and fraudulently making or altering a document and even possessing such a forged document. Digital forgery is the crime of falsely and fraudulently making or altering a documents and pictures in the digital domain. Examples of digital forgery include counterfeit currency notes, forgery of postage and revenue stamps, forgery of mark sheets etc. All of these acts of forgery are done by using computers and high quality scanners and printers.

There are different types of digital forgery. The most common types of digital forgery are mentioned below :

- **Document Forgery:** This type of forgery occurs when a legal document is forged or replicated by another person using digital means. This also includes forgery of mark sheets and revenue stamps.
- **Counterfeit Money Forgery:** This type of forgery occurs when the legal currency of a nation is forged or replicated by using digital means.
- **Digital Signature Forgery:** This type of forgery occurs when the signature of an individual is forged or replicated by another person using digital means.
- **Art Forgery:** This type of forgery occurs when a piece of art is replicated and sold as the original art piece. Sometimes the whole painting is forged and sometimes only the signature of a famous painter is forged into the painting with intensions to get more money.

## 15.6 IDENTITY THEFT

Identity theft is one of the oldest crimes in human history. Identity theft can be defined as stealing personal information of a person and impersonating as that person. The terms identity theft and identity fraud are often used interchangeably. But they refer to different crimes. In identity theft, a criminal impersonates another person who actually exists. In identity fraud, a criminal creates a fictional person and assumes this fictional person's identity. The criminal in identity fraud creates a whole new person, with both personal and financial details.

Identity theft is a much more common crime than identity fraud. Most of the information stolen is in identity theft is financial in nature regarding bank account or credit card details. But according to the victim's need different personal or financial information may be stolen. For example information like name, address, passport number, PAN number, bank account details, bank passwords, and debit or credit card details.

While most of the identity thefts are done for financial gain, there are many identity thefts done with other intentions too. According to a non-profit Identity Theft Resource Center identity theft can be categorized into five types depending on the intent. These categories are mentioned below:

- **Criminal Identity Theft:** In this type of identity theft, the criminal impersonates as another person as he/she is held accountable for a crime. The criminal identifies himself as another person to the state authority by using simple documents such as fake identity cards. This is usually done to get the police or court authorities off their back. The victim's of this identity theft may never come to know of these crimes done using their false impersonations.
- **Financial Identity Theft:** This is the most common type of identity theft. In this type of identity theft the criminal uses another person's identity to obtain money, loans or any other financial services using the victim's identity. These types of crimes are usually found out only the debts mount or when it is time to pay off the loan installments.

- **Identity Cloning:** In this type of identity theft, the criminal impersonates another person to conceal their own identity. The criminals are mostly persons hiding from debt collectors or who want to became someone else for personal reasons.
- **Medical Identity Theft:** This is a new type of identity theft where the criminals steal the identity of the victim's for medical benefits. The criminals pose as another person to get medical care like medical insurances and high cost drugs.
- **Child Identity Theft:** This is another type of identity theft where the criminals target minor children for their personal gain. The criminals steal the social security numbers of children and use is information for their own benefit.



**CHECK YOUR PROGRESS**

**Q.1 :** Define cyber crime?

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**Q.2 :** Differentiate between identity fraud and identity theft.

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**Q.3 :** Who are the crackers?

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## 15.7 CYBER STALKING

Stalking can be defined as an act of harassment targeting the victim. Stalking includes various acts such as following the victim, making harassing phone calls, vandalizing victim's property, leaving written messages or objects etc. Cyber stalking can be defined as the act of stalking done by

using the means of computer systems or internet. The terms cyber stalking and cyber bullying are often used interchangeably. But there is a difference between these two terms, even though in essence both are crimes. The term cyber bullying is generally used when the parties involved are not adults and includes teenagers or children.

In most of the cases of cyber stalking, the victim is harassed by the criminal by sending repeated storm of online messages and emails. The criminals often harass the victims by posting messages on websites or discussion groups. The criminals often try to track every moment of the victim's daily activity using the help of social media. Cyber stalkers use social media sites like Facebook, Twitter, MySpace to keep track of the victim's activities and location. In most of the cyber stalking cases, the stalkers are known to the victims and they use internet to stalk the victims. Also, in many cases, if the criminals find that online stalking does not have their desired effect, they then resort to both online and offline stalking. This crime is punishable by law in India and the first conviction for cyber stalking was sent to jail for three months.

## 15.8 CYBER TERRORISM

Cyber terrorism can be defined as an act of terrorism that is committed using computer systems and networks. Spreading terrorism through the means of internet has become an attractive option for modern terrorists. This is due to the fact that the terrorists prefer using the internet and other advanced technology in comparison to traditional methods because these machines can be accessed remotely. Another term that frequency comes when we speak of cyber terrorism is cyber warfare. Cyber warfare can be defined as the action by a nation or a state to penetrate another nation's computers or networks for the purpose of causing damage.

In cyber terrorism, the terrorists use the internet to conduct violent acts that may cause loss of life or bodily harm. The terrorists not only target human property and life but also try to cause deliberate failure of functioning of government services by targeting communication networks. Government

services like electric and solar power plants, air and rail traffic systems, telecommunication systems, medical services, police and military services are targeted mostly to paralyze the victim country. Large scale disruptions of these services are caused by using tools like computer viruses, worms and other malicious software. Most of the government websites are brought down by performing denial-of-service (DOS) attacks. In 1998, the first cyber terrorism attack was done by ethnic Tamil guerrillas by disrupting the Sri Lankan embassies using DOS attacks. The Sri Lankan embassies were attacked by sending around 800 e-mails a day for over a two week period.

## 15.9 CYBER DEFAMATION

Cyber defamation can be defined as defamation done using digital media usually through the internet. When a person publishes defamatory matter about someone on a website or sends e-mails containing defamatory information to all of that person's friends, it is termed as cyber defamation. The defamation can be done using words spoken orally or in written form or by signs or similar visible representations.

In most cases of cyber defamation when it is done with no serious grudge, it can be stopped by a cease and desist letter and by removing the messages from the digital media. But, if it is done with serious intent then the law can be used to punish the criminal. Cyber defamation not only harms the individual victim but also his family, but also the individual's organization and sometimes even the state or country of the victim. This depends on who the victim is and on what position the individual is currently working on. In such cases, the target for cyber defamation is often chosen not for personal grudge but for damaging the image of the organization or the country of the individual. The harm that is caused in defamation by using digital media is widespread and often irreparable as the information is already out over the whole internet. Some of the digital media that is used to perform cyber defamation are mention below :

- world wide web
- social networking sites
- email and messaging

- discussion groups
- bulletin boards

In India, there are two types of liability for defamation. The first category involves cases in which the liability is of the primary publishers of the defamatory content material. This category includes persons who has written the defamatory content material and then published this material in the cyber space. The second category involves cases in which the liability is of the internet service providers or bulletin board operators. This category includes persons who had authorized publication of the defamatory materials.

## 15.10 SOFTWARE PIRACY

Software piracy can be defined as the unauthorized copying or illegal distribution of copyrighted materials. Software piracy causes loss of revenue for the makers which in turn lads to the increased prices of software for the licensed consumers. Most of the software has an end user license agreement with the consumers. Violation of this agreement leads to software piracy.

Software piracy has been categorized into six categories. Let us look at each of these six software piracies.

- Softlifting: Softlifting or softloading is one of the most common types of software piracy. Softlifting is defined as sharing a program or software with someone who is not authorized to use that software in accordance with the licensing agreement. Most often a single licensed copy of the software is brought and but then it is loaded into multiple computer systems. Softloading is quite common in college campuses and businesses.
- Internet piracy: With the increasing number of internet users every year the number of persons committing internet piracy has grown tremendously. Internet piracy occurs when software is downloaded from the internet. There are a lot of websites where software is available for free unlimited download without following any licensing agreements.
- Software Counterfeiting: Software counterfeiting is the illegal duplication, distribution and sale of copyrighted software material. In software

counterfeiting it is common to make duplicate copies of the programs, the documentation and also the licensed agreements. Microsoft products are one of the most highly products to be counterfeited.

- Hard Disk Loading: Hark disk loading software piracy occurs when new computers are sold with unauthorized software. This is done by hardware dealers to make their products more attractive to the buyers.
- Renting: Renting involves the process of renting software to another person temporarily who does not have the authorized permission or license to use the software.
- Original Equipment Manufacturer (OEM) Unbundling: In this type of software piracy, sellers sell standalone software which are originally meant to be included with some other licensed product.

## 15.11 INFORMATION TECHNOLOGY ACT, 2000

The Information Technology (IT) Act, 2000 is an Act of the Indian Parliament enacted with the prime objective to create an enabling environment for commercial use of information technology. The IT Act specifies the acts which have been made punishable by law regarding cyber crime and electronic commerce in India. The IT Act has amended various sections of the Indian Penal Code (IPC) of 1860, the Indian Evidence Act of 1872, the Bankers Book of Evidence Act of 1891 and the Reverse Bank of India Act of 1934 to include cyber crimes done using new technologies. A major amendment of the IT Act was made in the year 2008 to include penalties for offensive messages, child pornography, cyber terrorism and voyeurism. In 2013, another amendment was made o include the offence of cyber stalking. Let us look at the various offenses that have been made punishable under the IT Act.

Some of the cyber crimes under the IT Act are mentioned below :

- Tampering with Computer source documents - Sec.65
- Hacking with Computer systems, Data alteration - Sec.66
- Sending any message that is offensive - Sec 66 A
- Publishing obscene information in electronic form - Sec.67
- Un-authorised access to protected system Sec.70

- Breach of Confidentiality and Privacy - Sec.72
- Publishing false digital signature certificates - Sec.73

Some of the cyber crimes under IPC are mentioned below :

- Cyber stalking - Sec 354D IPC
- Web-Hijacking - Sec. 383 IPC
- Bogus websites, cyber frauds - Sec 420 IPC
- Email spoofing - Sec 463 IPC
- Forgery - Sec 463 IPC
- Cyber defamation - Sec 499 IPC
- E-Mail Abuse - Sec.500 IPC
- Sending threatening messages by email - Sec 503 IPC



## CHECK YOUR PROGRESS

**Q.4 :** What are the different types of software piracy?

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**Q.5 :** Define cyber stalking.

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**Q.6 :** What are the different types of medium used for cyber defamation?

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**Q.7 :** What is the IT Act, 2000?

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## 15.12 LET US SUM UP

In this unit we have discussed the following aspects-

- Cyber crime can be defined as any crime that is performed using a computer and network either as a tool or as a target.
- Hacking can be defined as an illegal intrusion into a computer system or network. This is a type of crime where an individual or institution's computer is broken into so that personal or sensitive information can be accessed. The person who performs the act of hacking is known as a hacker.
- Ethical hackers are persons who hack into the computer system with an aim to identify the weaknesses present in the system and not for any personal gain. Crackers are persons who hack into the computer system with an aim to gain unauthorized access to the system or network for personal gain.
- Digital forgery is the digitization of the process of forgery. Forgery in traditional systems is the crime of falsely and fraudulently making or altering a document and even possessing such a forged document. Digital forgery is the crime of falsely and fraudulently making or altering a documents and pictures in the digital domain.
- Identity theft can be defined as stealing personal information of a person and impersonating as that person. In identity theft, a criminal impersonates another person who actually exists. In identity fraud, a criminal creates a fictional person and assumes this fictional person's identity.
- Cyber stalking can be defined as the act of stalking done by using the means of computer systems or internet. The term cyber bullying is generally used when the parties involved are not adults and includes teenagers or children.
- Cyber terrorism can be defined as an act of terrorism that is committed using computer systems and networks. Cyber warfare can be defined as the action by a nation or a state to penetrate another nation's computers or networks for the purpose of causing damage.

- Cyber defamation can be defined as defamation done using digital media usually through the internet. When a person publishes defamatory matter about someone on a website or sends e-mails containing defamatory information to all of that person's friends, it is termed as cyber defamation.
- Software piracy can be defined as the unauthorized copying or illegal distribution of copyrighted materials.
- The Information Technology (IT) Act, 2000 is an Act of the Indian Parliament enacted with the prime objective to create an enabling environment for commercial use of information technology. The IT Act specifies the acts which have been made punishable by law regarding cyber crime and electronic commerce in India.
- A major amendment of the IT Act was made in the year 2008 to include penalties for offensive messages, child pornography, cyber terrorism and voyeurism.



## 15.13 FURTHER READING

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2. Singh, K. K. (2011). *Information security and cyber law*. kk singh.
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## 15.14 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q1:** Cyber crime can be defined as any crime that is performed using a computer and network either as a tool or as a target.

**Ans to Q2:** In identity theft, a criminal impersonates another person who actually exists. In identity fraud, a criminal creates a fictional person and assumes this fictional person's identity. The criminal in identity

fraud creates a whole new person, with both personal and financial details whereas in identity theft, the criminal impersonates an already existing person.

**Ans to Q3:** Crackers are persons who hack into the computer system with an aim to gain unauthorized access to the system or network for personal gain.

**Ans to Q4:** There are six types of software piracy. They are - softloading, internet piracy, renting, software counterfeiting, hard disk loading and OEM unbundling.

**Ans to Q5:** Cyber stalking can be defined as the act of stalking done by using the means of computer systems or internet. In most of the cases of cyber stalking, the victim is harassed by the criminal by sending repeated storm of online messages and emails. The criminals often harass the victims by posting messages on websites or discussion groups.

**Ans to Q6:** The different types of media used for cyber defamation are world wide web, social networking sites, discussion groups, bulletin boards and using emails and messages.

**Ans to Q7:** The Information Technology (IT) Act, 2000 was enacted with the prime objective to create an enabling environment for commercial use of information technology. The IT Act specifies the acts which have been made punishable by law regarding cyber crime in India.



## 15.15 MODEL QUESTIONS

**Q.1.** What are the different types of cyber crime?

**Q.2.** Define digital forgery. What are the different types of digital forgery?

**Q.3.** Differentiate between cyber trolling and cyber bullying.

**Q.4.** What is cyber warfare? Give an example.

**Q.5.** Differentiate between identity fraud and identity theft?

**Q.6.** Describe the different types of identity theft?

**Q.7.** Describe the different categories of cyber defamation.

**Q.8.** Define hacking. How are the ethical hackers different from crackers?

**Q.9.** Define cyber stalking. How is the crime of cyber stalking performed? Whch section of IT Act deals with cyber stalking?

**Q.10.** Describe the laws related to cyber crime in India?

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# REFERENCE


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