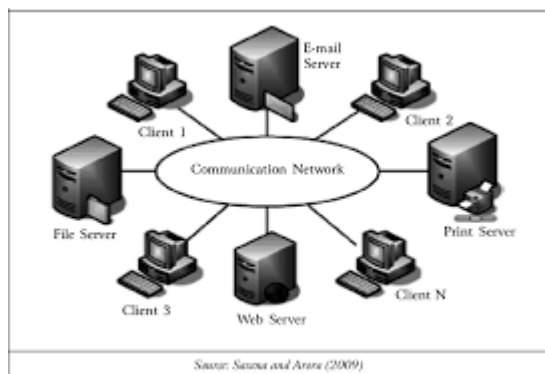


Unit-1**What is Computer Network?**

- A computer network consists of two or more computer that are connected to share resource (such as printers, scanner, CDs, etc) exchange files, or allow electronic communications.
- More than one computer interconnected through a communication medium to interchange information and resource is called a computer network.



- You can place a disc with pictures on one computer and let other computer access those pictures.
- You can may have a computer with a CD/DVD writer but the other computer don'ts have it. In this case you play burn disc or make backup for all other interconnected computer that doesn't have a disc writer or a backup system.
- You can connect a printer or a scanner, or a fax machine to one computer and let other computer of the network to use these resources.
- You can create files and store them in one computer then access those files from the other computers.

Advantages and Disadvantages of computer networks:-

- A Computer network is basically of computers and resource like printers, scanner, etc. Here are some of the advantages and disadvantages of computer networks.

Advantages of computer networks: -

- **File Sharing:** - The major advantage of computer network is that it allows file sharing and remote file access. A person sitting at one computer of a network can easily access the file which is stored on another computer.
- **Resource sharing:** - Resource sharing is also an important benefit of a computer network. Multiple computers can be connected with each other and share the resources like printer, modem, folders etc...
- **Increased storage capacity:** - A single computer might fall of storage memory, but when many computers are on network, storage memory of different computers can be used in such case. One can also design a storage server on the network in order to have a huge storage capacity.
- **Increase cost efficiency:** - There are many type of software available in the market which are costly and take time for installation. Computer network resolve this problem as the software can be stored or installed on a system.

Disadvantages of computer network: -

- **Security issue:** - One of the major drawbacks of computer network is the security. If a computer is on network, a computer hacker can get access by using different tools. In the case of big organization, various network security software are used to stop network attack for confidential data.
- **Computer viruses:** - Any computer system is on network get affected by viruses. It is possible that virus of other system getting affected too. Viruses are spread on a network easily because each computer is connected with each other. Data are corrupted by the virus.
- **Expensive set up:** - The set up cost of computer network can be high depending on the number of computers to be connected. Network devices are costly like router, hubs, switch, fibrotic cable, NIC cards, etc...
- **Server failure:** - In the case of main server of computer network break down, the system become useless.

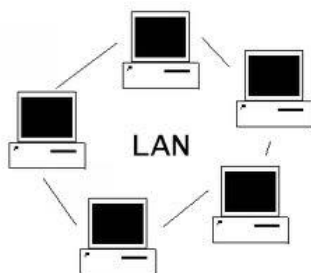
Types of Computer network (Categories of networks)

- There are many types of computer networks but they are broadly classified in three categories.

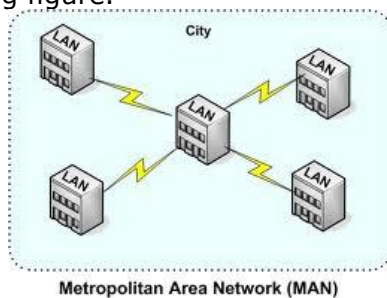
- 1) **LAN**
- 2) **MAN**
- 3) **WAN**

1) Local area network (LAN): -

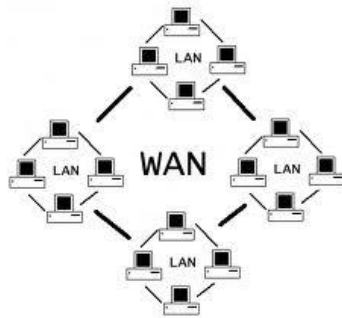
- A LAN is usually private network.
- This is created in single office, building, or campus.
- Depending on the needs of organization LAN is created.
- LAN size is limited up to a few kilometres.
- LAN is designed to allow resources to be shared between computers.
- The resources to be shared can be includes hardware, software, or data.
- One of the computers may be given a large capacity disk drive and become a server to the other client.
- Software can be stored on central server and used by all clients.
- The data rate of LAN is up to 100 Mbps with gigabit.

**2) Metropolitan area network (MAN): -**

- A MAN is designed for an entire city.
- It may be a single network or connecting a multiple LAN in large network.
- By using MAN we can share the resources of LAN-to-LAN as well as device-to-device.
- A MAN may be operated by private company or any service provider.
- Consider the following figure.

**3) Wide area network (WAN): -**

- A WAN provides communication for long distance.
- WAN provides long distance transmission of data, voice, image, and video information over world wide.
- A WAN that is handled and used by a single company is often referred to as an enterprise network.
- WANs may used public line, leased line, or private communication devices and therefore they are covers the large geographical areas.



❖ Internet:-

- Internet is the largest network.
- Internet was originally developed in 1969 for the U.S. Department of Defence.
- The internet is a massive collection of computer networks that connect millions of computers, people, software programs, database and files which interact continuously.
- Internet are two word combination → **Interconnection + Network = Internet**
- The world linking together thousands of individual networks of universities, educational and research institutions, military and government agencies, industrial and financial organizations, and internet service provider(ISP) that provides services to individual to access the network.
- Internet is not owned by anyone, but is governed by collective efforts of every origination whose network is connected with internet.
- Internet offers many services like World Wide Web (WWW), email, chats, file sharing, instant messenger, adventure and role playing ga
- mes, information retrieval and e-commerce.
- **ADSL:- Asymmetric Digital Subscribers Line**



- Computers which are connected though internet can identify one another using either domain name or IP address.

<u>Domain Name</u>	<u>Description</u>
In	India
Pk	Pakistan
Uk	United States of America
Ch	China

<u>Domain Name</u>	<u>Description</u>
.com	Commercial Organization
.gov	Government Organization
.org	Non-profit organization

.edu	Educational Organization
.mil	Military Group

- Any computer which is directly connected to the internet requires 32 bit unique identification number which is known as IP address.

❖ URL (Uniform Resource Locator):-

- Uniform Resource Locator (URL)** is the address that defines the route to a file on an Internet server.
- The URL Contains the protocol prefix, port number, domain name, subdirectory name and file name. if a port number is not stated in the address, port 80 is used as the default for HTTP traffic.
- URL consists of the access protocol the domain name and optionally the path to a file or resource residing on that web server.
- If a web page is stored in a subdirectory, its name is also separated by a slash subdirectories can be several levels deep. For ex. The components of the following hypothetical URL are below.
- <http://www.htmlbook.com/html/chapter1.html>
- http: Protocol
- // Separators
- www.htmlbook.com/ Domain name
- Html/ Subdirectory name
- Chapter1.html Document name (web page)



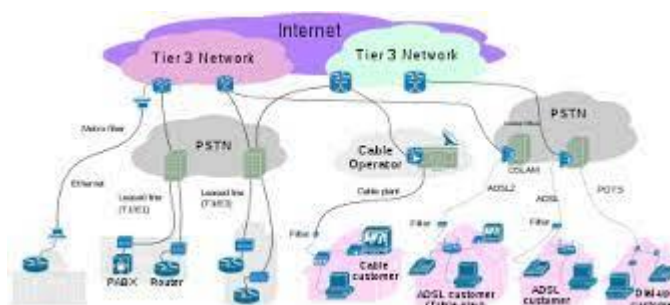
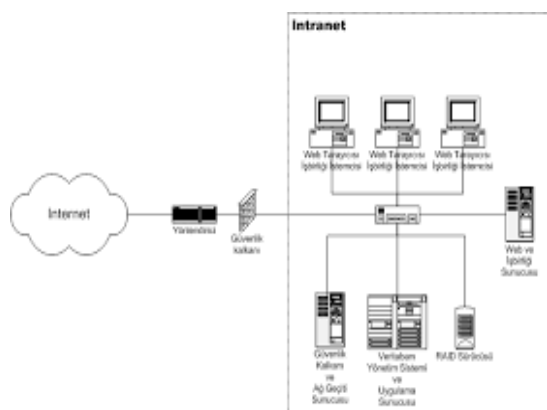
❖ Internet Service Provider (ISP):-

- Internet Service Provider** is an organization that provides access to the internet and related services.
- ISPs provide internet service via modem and ISDN. Customers are generally billed a fixed rate per month, but other charges may apply according to usage of the services.
- A web site can be created and maintained on the ISP's server, allowing the smaller organization to have a presence on the web with its own domain name.
- Bharat sanchar nigam limited (BSNL), Mahanagar telephone nigam limited (MTNL), Iccnet, willnet, Reliance infocom, tata indicom etc. are well known ISP.

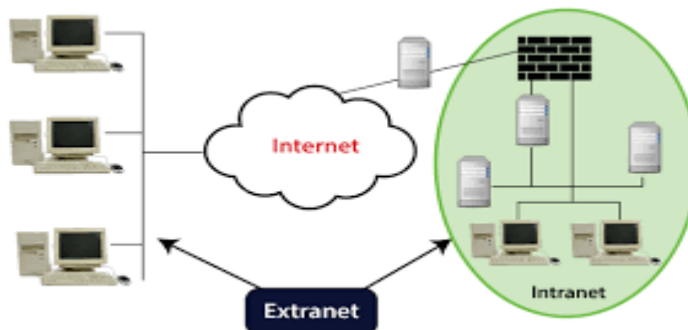


❖ **Intranet :-**

- Intranet is a privately maintained computer network that can be accessed only by authorized persons and employees of the organization that owns it.
- Intranet web site provides various services to the employee of the organization.
- Intranets use the same web server technology, communications protocols and HTML hypertext links as the internet.
- It provides a standard way of distributing organization internal information to employee in local and remote offices.
- Intranets are used to deliver tools and applications such as sophisticated corporate directories, sales and project management etc.
- **Advantages of Intranet:-** Intranet can help employees to quickly find and view information and applications relevant to their roles and responsibilities.
- It can help organizations to make more information available to employees on a PULL basis rather than being randomly PUSH via emails.
- It is a powerful tool for communication within an organization.

❖ **Extranet :-**

- Extranet is a part of organization intranet that is made accessible to customers, business partners, suppliers or others outside the company.
- Extranet provides limited access to its intranet.
- It can provide access to research, current inventories and internal database, virtually any information that private and not published for everyone.
- Extranet uses the public internet as its transmission system, but requires password to entrance.
- Extranet use the same web server technology, communication protocols and HTML hypertext links as the internet.
- Extranet using firewalls, server management, digital certificates, encryption and virtual private networks (VPN).

❖ **Difference between Internet and Intranet**

- | <u>Internet</u> | <u>Intranet</u> |
|----------------------------------------|-------------------------------------------------------------|
| ✓ Internet is a public network. | => Intranet is a private network. |
| ✓ Any one can access the internet | => only member of university, company, can access intranet. |
| ✓ Internet is less secure | => intranet is completely (more) secure. |
| ✓ There is no owned of internet. | => but, intranet has some owned |
| ✓ Can access without any user account. | => can access only id/password account. |

- ✓ **Extranet** :- need user id.
- ✓ Allow outside user to access the network.
- ✓ Limited
- ✓ Extranet is a part of organization intranet.

❖ **Virtual Private Network (VPN):-**

- A **Virtual Private Network (VPN)** is a private communication network used within an organization to communicate over a public network.
- VPN is widely used by enterprise to create wide area network (WANs) that span large geographic areas, to provide connections to branch offices and to allow users to use company's LANs.
- VPN message traffic is carried on the internet using standard protocols, many VPN clients programs can be configured to require that all IP traffic must pass through the tunnel while the VPN is active for better security.
- Various types of security services like authentication, encryption, data integrity and non repudiation are offered by virtual private network.
- **Advantages of VPN:-**
 - Extend geographic connectivity.
 - Reduce transit time and transportation costs for remote users.
 - Simplify network topology,
 - Provide global networking opportunities.
 - Provide broadband networking compatibility.
 - Provide faster ROI (Return on Investment) than traditional carrier leased/owned WAN lines.
 - Show a good economy of scale.



❖ **Application of Internet:-**

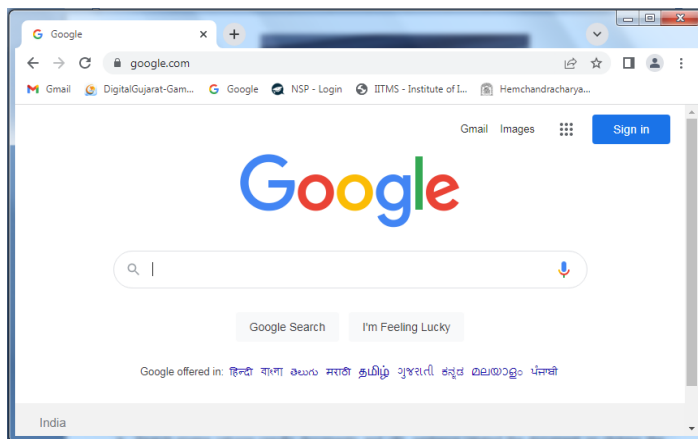
❖ **WWW(world wide web):-**

- World wide web is also known as web.
- Web is a software that makes browsing of hypertext document easy over the internet.
- You can access all information available on the internet web is driving force behind the internet.
- The www client/server software design model. Client software can be used to request information and server software used to process on request and provide information to resolve the request.

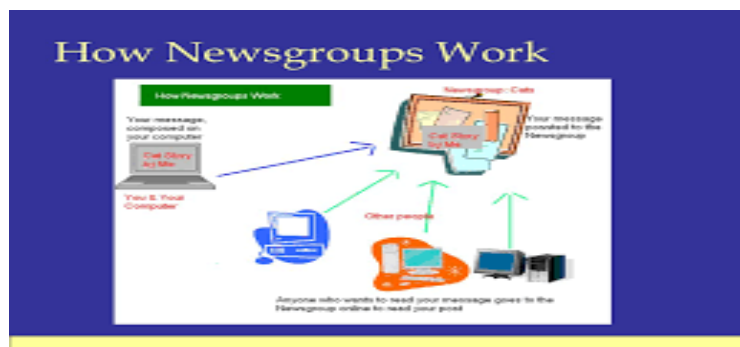


❖ **Search Engines:-**

- A Search engine is an approach for organizing and locating information on the web.
- Lycos, excite, alta vista, HotBot, infoseek, Google etc. are popular search engines.
- Search engine of three parts- spider, database, search tool.
- Spider across the internet to collect information. Database contains all the information that spider collects. Search tools are people to search the database of search engine.
- Search engine uses a spider to gather documents according to well set rules.
- Indexing software then extracts information from documents and URLs and stores in the database.
- Search engine for any topic, one has to type keywords. Database of search engine search according to the criteria set for keywords.
- Search engine returns results documents and URL sentence related the document on clicking the hyper link will display the corresponding page over the internet.

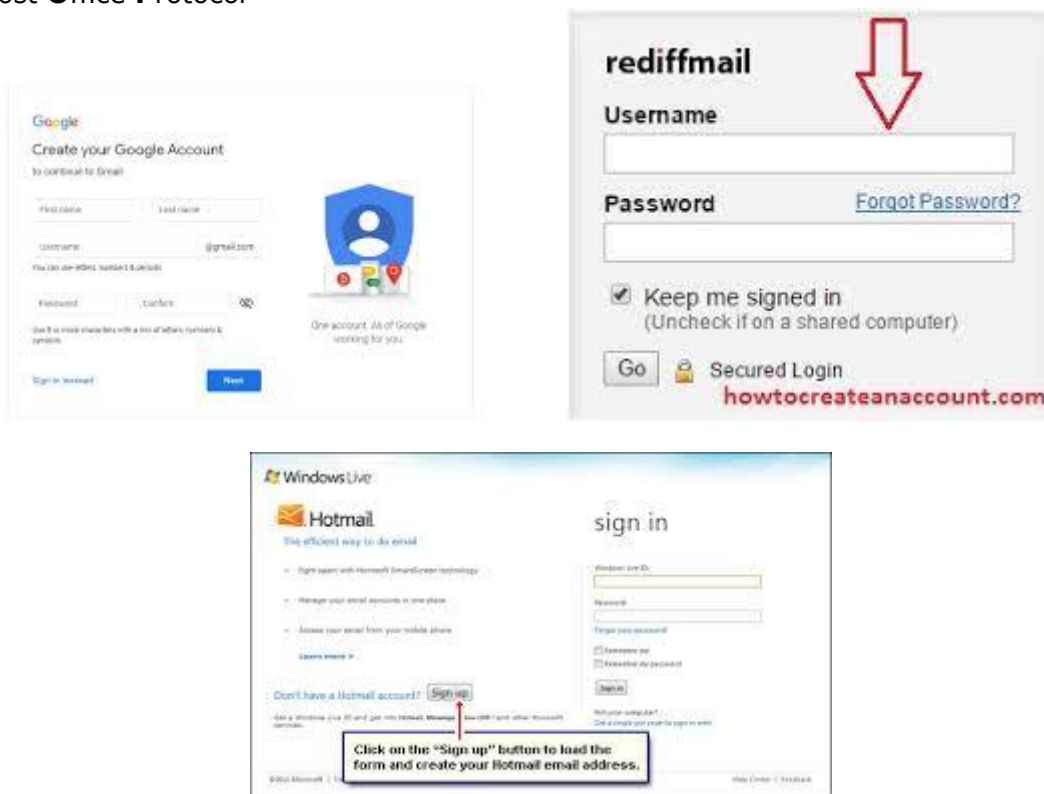
❖ **Newsgroup:-**

- Newsgroup is a virtual discussion group in which people using computer can participate from all over the world.
- Each Newsgroup is based on particular topics, like sports, environment, politics, arts, history, chemistry, biology, medical science, music, etc.
- Anybody who is a member of newsgroup can send message via email which is known as an article.
- This message becomes available to other members of the newsgroup. They can share their views and opinions regarding the articles.
- Newsgroup can be two categories- Moderated newsgroup, & Unmoderated newsgroup.
- Moderated newsgroup a moderator of the newsgroup receives all the messages from the newsgroup members.
- Unmoderated newsgroup all messages are posted directly to the news server without moderation.
- Newsgroup client software allows members to read articles and submit their opinions to the news server.

❖ **Electronic Mail (E-mail) :-**

- Email is method of composing, sending, and receiving, messages over electronic communication systems.
- Users can send mail to a single recipient or broadcast it to multiple users.

- Using email anybody can send text message, pictures, audio, and video clips to any other person over the internet anywhere in the world.
- If you send email to anybody in the world then you should know the recipient email address.
- When you open an internet account with ISP, you gets an email address several web sites like Hotmail, yahoo!, rediffmail, sify, gmail etc. you can create free email account.
- When you open free email account with an email site, it will provide you a unique email address after filling up and submitting an online registration form.
- SMTP:- Simple mail transfer protocol the mail client to send message to the mail server. Mail should be sent to the mail server. SMTP sends message in ASCII character set the mail server.
- Email provides high speed data-transfer.
- It is not only used for transferring text but it is also used to transfer non text data.
- It provides a platform to a group of people wishes to share their views and suggestions on common interest subjects.
- It can be used to pull various values added service from the server.
- **SMTP- Simple Mail Transfer Protocol**
- **IMAP- Internet Mail Access Protocol**
- **IMAP-Internet Mail Access Protocol**
- **MIME-Multipurpose Internet Mail Extension**
- **POP- Post Office Protocol**



❖ Web Portal :-

- Web portal is a website that is considered as an entry point to other websites.
- It provides a variety of services including web search, news, free e-mail, discussion groups, shopping and links to other sites.
- Yahoo, MSN, rediff and AOL are general purpose web portals. Many portals allow you to define personalized home page.
- Many organizations build a portal to get themselves recognized through internet in the global market.
- Some of the government departments and NGOs build portals to create awareness and guide the communities to number of other useful resources.
- The portals initially started as web directories or search engines and services were expanded gradually to attract more and more users.
- Many portals also offer the facility of user registration to encourage repeated use of their personalised services like game, chat, email etc.



❖ **Chat :-**

- Chat is a real time conferencing capability between two or more users on the internet.
- In chat the communication is done by typing using the keyboard and the keystroke is transmitted as it is pressed.
- Chat system has a variety of flavours ranging from text only messaging systems to fully immersive 3D environments.
- Recently these systems have started to incorporate the ability to chat with multiple people simultaneously.

❖ **Chat Rooms :-**

- Chat rooms host an interactive online discussion about a specific topic over the internet chat rooms services are offered by many portals like AOL, yahoo, MSN, etc.
- Chat rooms are set up to handle group discussions and everyone can see what others are typing, although two people can decide to break off the group chat have their own personalized chat.
- Instant messaging is the transmission of an electronic message over a computer network using software that immediately displays the message in a window on the screen of the recipient.
- Chat room provides the list of people who have logged into chat room and a facility to select any person to chat.
- Internet relay chat of real time online conversations over the internet. It is mainly designed for group (many to many) communication in discussion forums called channels but also allows one to one communication.



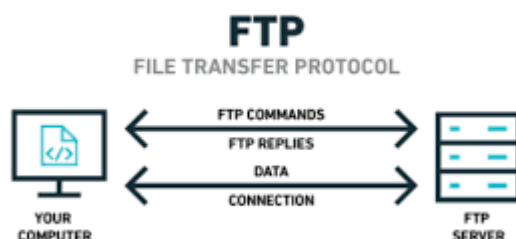
❖ **Video-Conferencing :-**

- Videoconferencing is a set of interactive telecommunication technologies which allow two or more locations to interact via two way video and audio transmissions simultaneously.
- High speed internet connectivity has become more widely available at a reasonable cost and the cost of video capture and display technology has also decreased.
- Personal video teleconference systems based on a webcam, personal computer system software compression and broadband internet connectivity have become the general public.
- Videoconferencing provides the opportunity to communicate and to learn by participating in 2 way communication platform.
- Learning courses because teachers and lecturers from all over the world can be brought to classes in remote places using videoconferencing.
- Students can explore communicate, share information and ideas with one another.
- Videoconferencing technology can be for used medical diagnostic purposes also and can be useful in saving lives at remote places.



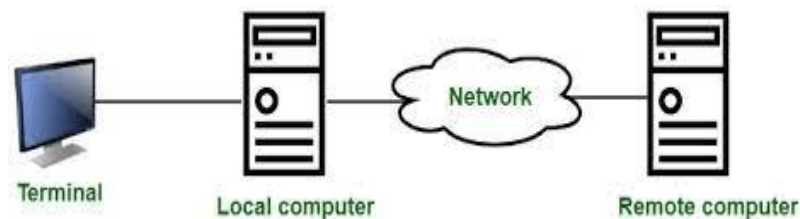
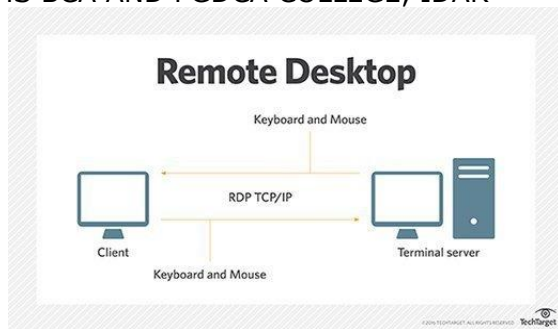
❖ **File Transfer Protocol (FTP) :-**

- FTP is an application which allows you to transfer files between two different computers over the internet.
- FTP offers two functionalities. 1) File Downloading 2) File uploading
- **File Downloading** is a process of copying a file from remote computer to your computer.
- **File Uploading** is a process of sending a file from your computer to remote computer.
- Many government and non-government organization, universities and corporate section offer FTP services to the general public.
- If you wish to access files located on FTP server you require FTP client works on client server model.
- FTP client is a program used to transfer data to FTP server.
- FTP client can be classified in two categories.
- 1) **GFTC** (Graphical file transfer client) (2). **TBFC** (Text-based file transfer client)
- GFTC client is very easy and user friendly.
- TBFC protocol you can connect to the FTP server using ftp command on text based ftp client.



❖ **Remote Login :-**

- Telnet and remote login allow you to login to remote computer from your PC and interact with software on remote machine.
- Telnet user TELNET protocol to login to remote computer and it follows the client server model.
- The TELNET protocol specifies how a remote login client and a remote login server interact.
- For telnet remote computer is called host computer.
- The host computer allows many different clients to use its recourse at the same time.
- When we have logged on to host computer, the typed text in a telnet session accumulates in a buffer on our computer.
- The data is sent to host across the internet IP address is also attached is also sent so that the host computer may send the requisite information back.



❖ **E-Commerce :-**

- E-commerce is buying and selling of goods and services over the internet.
- The main goal of e-commerce is to reduce transaction cost and reform various business processes.
- E-commerce enables new forms and ways of business. It includes commercial activities involving email, an online information service, a bulletin board system, electronic data interchange system etc.
- It provides global market with no geographic boundaries and access to millions of people to the core business process.
- E-commerce application can be classified in three broad categories business-to-consumer (B2C), Business-to-Business (B2B), and Consumer-to-Consumer (C2C).
- E-commerce offers short-term and long-term gain to business.
- E-commerce provides wide range of cost effective choices to buyers.
- It reduces paper work involved in business processes.
- It opens global market and provides easy and fast way to reach to potential customers with enriching services to existing customer.



❖ **E-Learning:-**

- E-learning is an approach to facilitate and enhance effective learning using computer and communication technology.
- E-learning provides flexibility in the learning and helps to overcome the time constraint from learning process.
- E-learning course's can be designed and developed according to specific needs and asynchronous learning mode.
- E-learning provides a student-centred learning solution, which is build upon cognitive, emotional, behavioural and social pedagogy.
- E-learning is very effective and efficient tool of learning because place and time of learning is defined by learner in e-learning.
- E-learning the human interaction with a teacher has been removed from the teaching process which was considered be core part of any educational courses. human interactions can be encouraged through video-conferencing.

- Most often HTML is used to incorporate various e-learning media. Macromedia flash is also used with its scripting language Action script for providing interactivity to the learner.
- Data conferencing applications are sometimes used to share and manipulate e-learning media.



❖ **E-Governance:-**

- E-governance helps government to increase transparency, reduce administrative corruption, and improve performance of public service delivery, empowerment and improving government revenue growth and cost reduction.
- E-governance is the use of ICT by the government, civil society and political institutions to boost participation of citizens in the process governance.
- ICT infrastructure and the institutional capacity to absorb and manage change are critical factors, which directly effect successful implementation of e-governance.



❖ **E-Banking:-**

- Internet banking sector also takes help of internet in corporate and retails banking.
- Using banking you can pay bills, deposit or transfer funds, order cheques and take care other banking responsibilities.
- E-banking cheques are automatically sent to the other party account which will help to save postage and other overhead costs.
- Various companies like pay pal offers to transfer money between different accounts with the simple click of a mouse.
- It offers a cost efficient alternative to telephone and branch banking due to the relatively low maintenance and update expenses.
- In can be accessed at any time from any internet connection.
- It does not require any human interaction at bank end.
- E-banking can help you in many different ways, from managing your finances and checking and savings accounts to brokerage and investment accounts.
- Put your money in stocks and trade using online tools and watch your money grow online.

