Subject: E-Commerce	
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Lesson : Introduction to Internet: Concept, Applications and Internet Services	Vetter: Prof. Dharmender Kumar,

LESSON STRUCTURE

1.0   Learning Objectives

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1.3   Basic Concepts of Internet

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1.0   Learning Objectives

After going through this lesson, you would be able to:

- explain various terminology used in internet

- use various services provided by internet

- search the desired information over internet

- define e-mail and its various features

- explain the advantages and limitations of internet

1.1   Assessment of prior Knowledge

In the present age of information Technology, use of Internet is becoming quite popular for accessing information on any topic of your interest. It also provides tremendous opportunities to

students, researchers and professionals for getting information on matters related to academic and professional topics and lot more. In the present world, most of the people who have computers around themselves use Internet to access information from the World Wide Web, exchange messages & documents and e-services.

1.2 INTERNET

The **Internet** is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/ IP) to serve billions of users worldwide. It is a *network of networks* that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies. The Internet carries a vast range of information resources and services, such as inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support electronic mail.

1.2.1 Uses of Internet

Internet has been the most useful technology of the modern times which helps us not only in our daily lives, but also our personal and professional lives developments. The internet helps us achieve this in several different ways.

For the students and educational purposes the internet is widely used to gather information so as to do the research or add to the knowledge of various subjects. Even the business professionals and the professionals like doctors, access the internet to filter the necessary information for their use. The internet is therefore the largest encyclopaedia for everyone, in all age categories. The internet has served to be more useful in maintaining contacts with friends and relatives who live abroad permanently.

1.2.2. Advantages of Internet:

- **E-mail:** Email is now an essential communication tools in business. With e-mail you can send and receive instant electronic messages, which work like writing letters. Your messages are delivered instantly to people anywhere in the world, unlike traditional mail that takes a lot of time. Email is free, fast and very cheap when compared to telephone, fax and postal services.
- **24 hours a day** - **7 days a week**: Internet is available, 24x7 days for usage.

- **Information:** Information is probably the biggest advantage internet is offering. There is a huge amount of information available on the internet for just about every subject, ranging from government law and services, trade fairs and conferences, market information, new ideas and technical support. You can almost find any type of data on almost any kind of subject that you are looking for by using search engines like google, yahoo, msn, etc.

- **Online Chat:** You can access many 'chat rooms' on the web that can be used to meet new people, make new friends, as well as to stay in touch with old friends. You can chat in MSN and yahoo websites.

- **Services:** Many services are provided on the internet like net banking, job searching, purchasing tickets, hotel reservations, guidance services on array of topics engulfing every aspect of life.

- **Communities:** Communities of all types have sprung up on the internet. Its a great way to meet up with people of similar interest and discuss common issues.

- **E-commerce:** Along with getting information on the Internet, you can also shop online. There are many online stores and sites that can be used to look for products as well as buy them using your credit card. You do not need to leave your house and can do all your shopping from the convenience of your home. It has got a real amazing and wide range of products from household needs, electronics to entertainment.

- **Entertainment:** Internet provides facility to access wide range of Audio/Video songs, plays films. Many of which can be downloaded. One such popular website is YouTube.

- **Software Downloads:** You can freely download software like utilities, games, music, videos, movies, etc. from the internet.

1.2.3 Limitations of Internet

- **Theft of Personal information**: Electronic messages sent over the Internet can be easily snooped and tracked, revealing who is talking to whom and what they are talking about. If you use the Internet, your personal information such as your name, address, credit card, bank details and other information can be accessed by unauthorized persons. If you use a credit card or internet banking for online shopping, then your details can also be 'stolen'.

- **Negative effects on family communication:** It is generally observed that due to more time spent on Internet, there is a decrease in communication and feeling of togetherness among the family

members.

- **Internet addiction:** There is some controversy over whether it is possible to actually be addicted to the Internet or not. Some researchers claim that it is simply people trying to escape their problems in an online world.

- **Children using the Internet:** has become a big concern. Most parents do not realize the dangers involved when their children log onto the Internet. When children talk to others online, they do not realize they could actually be talking to a harmful person. Moreover, pornography is also a very serious issue concerning the Internet, especially when it comes to young children. There are thousands of pornographic sites on the Internet that can be easily found and can be a detriment to letting children use the Internet.

- **Virus threat**: Today, not only are humans getting viruses, but computers are also. Computers are mainly getting these viruses from the Internet. Virus is a program which disrupts the normal functioning of your computer systems. Computers attached to internet are more prone to virus attacks and they can end up into crashing your whole hard disk.

- **Spamming:** It is often viewed as the act of sending unsolicited email. This multiple or vast emailing is often compared to mass junk mailings. It needlessly obstructs the entire system. Most spam is commercial advertising, often for dubious products, get-rich-quick schemes, or quasi-legal services. Spam costs the sender very little to send — most of the costs are paid for by the recipient or the carriers rather than by the sender

1.3 BASIC CONCEPTS OF INTERNET

1.3.1 WWW

WWW stands for World Wide Web. It is developed by Tim Berners-Lee. The World Wide Web is the universe of network-accessible information. In simple words, The World Wide Web is a way of exchanging information between computers on the Internet.

1.3.2 HTTP

 HTTP stands for "Hyper Text Transfer Protocol". This protocol is used to transfer hypertext documents that make the World Wide Web possible. The main purpose of this protocol is to define how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands. A standard web address is needed to transfer the hypertext document. This address is referred as "URL address".

1.3.3 URL

URL stands for Uniform Resource Locator. A URL is the fundamental network identification for any resource connected to the web (e.g., hypertext pages, images, and sound files).

Format of URL- protocol://domain Or IP Address: port/path/filename

- **Protocol-** It indicates what protocol will be used to access the URL .For example: HTTP (Hyper Text Transfer Protocol) for transferring web content. The protocol is followed by: // symbol.

- **Domain or IP address** - Specifies an IP address or domain where the resource is located such as www.gmail.com or 10.1.1.1.

- **Port** - Specifies the port to use for the connection. It is usually omitted, as default ports are used for various protocols such as port 80 for HTTP.

- **Path** - Specifies a subdirectory at the server where the resource is located. If the path is omitted, then the root directory at the server is checked for the resource.

- **Filename** - The actual name of the resource. If the filename is omitted, then a default filename is used.

1.3.4 WEBSITE

It is a collection of various pages written in HTML markup language. Websites can be accessed via a public Internet Protocol (IP) network, such as the Internet, or a private local area network (LAN), by a uniform resource locator (URL) . Each page available on the website is called a *web page* and first page of any website is called *home page* for that site.

The *home page* is used to facilitate navigation to other pages on the site by providing links to prioritized and recent articles and pages.

*Web pages* are hyperlinked using HTML language.

1.3.5 WEB SERVER

Every Website sits on a computer known as a Web server. Web server is always connected to the internet and a unique address is assigned to each website which is made up of a series of four numbers between 0 and 256 separated by periods. For example, 68.178.157.132.

The primary function of a web server is to store, process and deliver web pages to clients. The

communication between client and server takes place using the Hypertext Transfer Protocol (HTTP).

Whenever you view a web page on the internet, you are requesting that page from a web server. When you type a URL into your browser, your browser requests the page from the web server and the web server sends the page back:
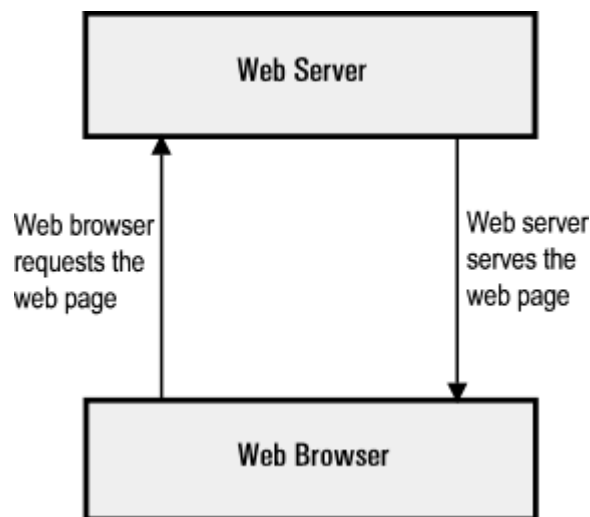
1.3.6 WEB BROWSER

Web Browsers are software installed on your PC. To access the Web you need a web browser. Common web browsers include Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari. .

Use of web browser-a browser is used to locate, retrieve and display content on the World Wide Web, including web pages, images, video and other files.

1.3.7 ISP

ISP stands for *Internet Service Provider*. They are the companies who provide you service in terms of internet connection to connect to the internet.

1.3.8 HTML

HTML stands for "Hyper Text Markup Language". This is the language in which we write web pages for any Website.

1.4 TYPES OF INTERNET CONNECTIONS

There are five types of internet connections which are as follows:

- Dial up Connection
- Leased Connection
- DSL connection
- Cable Modem Connection
- VSAT

1.4.1 Dial up connection

Dial-up refers to an Internet connection that is established using a modem. The modem connects the computer to standard phone lines, which serve as the data transfer medium. When a user initiates a dial-up connection, the modem dials a phone number of an Internet Service Provider (ISP) that is designated to receive dial-up calls. The ISP then establishes the connection, which usually takes about ten seconds and is accompanied by several beeping and a buzzing sound. After the dial-up connection has been established, it is active until the user disconnects from the ISP. Typically, this is done by selecting the "Disconnect" option using the ISP's software or a modem utility program. However, if a dial-up connection is interrupted by an incoming phone call or someone picking up a phone in the house, the service may also be disconnected.

Advantages

- Low Price
- Secure connection – your IP address continually changes
- Offered in rural areas – you need a phone line

Disadvantages

- Slow speed.
- Phone line is required.
- Busy signals for friends and family members.

1.4.2 Leased Connection

Leased connection is a permanent telephone connection between two points set up by a telecommunications common carrier. Typically, leased lines are used by businesses to connect geographically distant offices. Unlike normal dial-up connections, a leased line is always active. The fee for the connection is a fixed monthly rate. The primary factors affecting the monthly fee are distance between end points and the speed of the circuit. Because the connection doesn't carry

anybody else's communications, the carrier can assure a given level of quality.

For example, a T-1 channel is a type of leased line that provides a maximum transmission speed of 1.544 Mbps. You can divide the connection into different lines for data and voice communication or use the channel for one high speed data circuit. Dividing the connection is called multiplexing.

Increasingly, leased lines are being used by companies, and even individuals, for Internet access because they afford faster data transfer rates and are cost-effective if the Internet is used heavily.

Advantage

- Secure and private: dedicated exclusively to the customer

- Speed: symmetrical and direct

- Reliable: minimum down time

- Wide choice of speeds: bandwidth on demand, easily upgradeable

- Leased lines are suitable for in-house office web hosting

Disadvantages

- Leased lines can be expensive to install and rent.

- Not suitable for single or home workers

- Lead times can be as long as 65 working days

- Distance dependent to nearest POP

- Leased lines have traditionally been the more expensive access option. A Service Level Agreement   (SLA) confirms an ISP's contractual requirement in ensuring the service is maintained. This is often lacking in cheaper alternatives.

1.4.3 DSL connection

Digital Subscriber Line (**DSL**) is a family of technologies that provides digital data transmission over the wires of a local telephone network. DSL originally stood for *digital subscriber loop*. In telecommunications marketing, the term DSL is widely understood to mean Asymmetric Digital Subscriber Line (ADSL), the most commonly installed DSL technology. DSL service is delivered simultaneously with wired telephone service on the same telephone line. This is possible because

DSL uses higher frequency bands for data separated by filtering. On the customer premises, a DSL filter on each outlet removes the high frequency interference, to enable simultaneous use of the telephone and data.

The data bit rate of consumer DSL services typically ranges from 256 kbit/s to 40 Mbit/s in the direction to the customer (downstream), depending on DSL technology, line conditions, and service-level implementation. In ADSL, the data throughput in the upstream direction, (the direction to the service provider) is lower, hence the designation of asymmetric service. In Symmetric Digital Subscriber Line (SDSL) services, the downstream and upstream data rates are equal.

Advantages:

- **Security:** Unlike cable modems, each subscriber can be configured so that it will not be on the same network. In some cable modem networks, other computers on the cable modem network are left visibly vulnerable and are easily susceptible to break in as well as data destruction.
- **Integration:** DSL will easily interface with ATM and WAN technology.
- High bandwidth
- Cheap line charges from the phone company.
- Good for "bursty" traffic patterns

Disadvantages

- **No current standardization:** A person moving from one area to another might find that their DSL modem is just another paperweight. Customers may have to buy new equipment to simply change ISPs.
- **Expensive:** Most customers are not willing to spend more than $20 to $25 per month for Internet access. Current installation costs, including the modem, can be as high as
- $750. Prices should come down within 1-3 years. As with all computer technology, being first usually means an emptier wallet.
- **Distance Dependence:** The farther you live from the DSLAM (DSL Access Multiplexer), the lower the data rate. The longest run lengths are 18,000 feet, or a little over 3 miles.
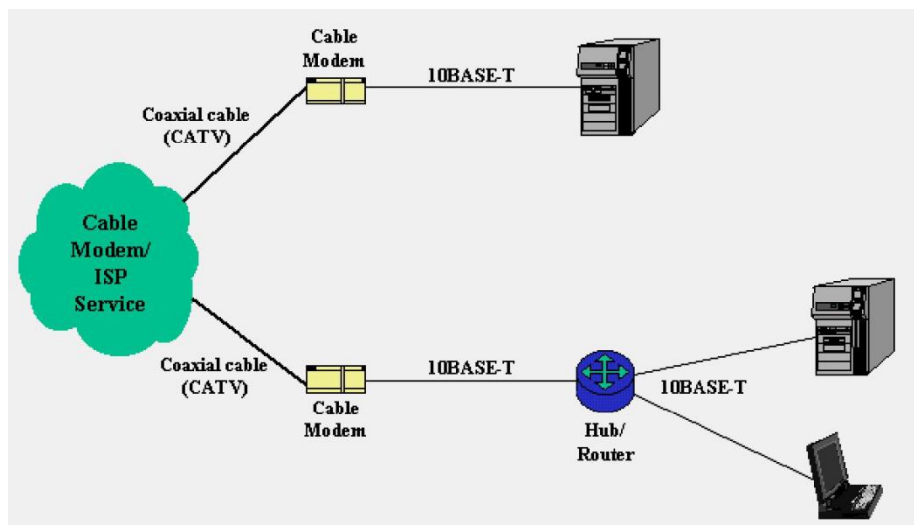
1.4.4 Cable Modem Connection

A **cable modem** is a type of Network Bridge and modem that provides bi-directional data

communication via radio frequency channels on a HFC and RFoG infrastructure. Cable modems are primarily used to deliver broadband Internet access in the form of cable Internet, taking advantage of the high bandwidth of a HFC and RFoG network. They are commonly deployed in Australia, Europe, Asia and Americas.

The following figure shows the most common network connection topologies when using cable modems. The cable TV company runs a coaxial cable into the building to deliver their Internet service. Although fed from the same coax that provides cable TV service, most companies place a splitter outside of the building and runs two cables in, rather than using a splitter at the set-top box. The coax terminates at the cable modem.

The cable modem itself attaches to the SOHO computing equipment via its 10BASE-T port. In most circumstances, the cable modem attaches directly to a user's computer. If a LAN is present on the premises (something many cable companies frown upon), some sort of router can be connected to the cable modem.

Advantages

- **Always Connected:** A cable modem connection is always connected to the Internet. This is advantageous because you do not have to wait for your computer to "log on" to the Internet; however, this also has the disadvantage of making your computer more

vulnerable to hackers. Broadband: Cable modems transmit and receive data as digital packets, meaning they provide high-speed Internet access. This makes cable modem connections much faster than traditional dial-up connections.

- **Bandwidth:** Cable modems have the potential to receive data from their cable provider at speeds greater than 30 megabits per second; unfortunately, this speed is rarely ever realized. Cable lines are shared by all of the cable modem users in a given area; thus, the connection speed varies depending upon the number of other people using the Internet and the amount of data they are receiving or transmitting.

- **File Transfer Capabilities:** Downloads may be faster, but uploads are typically slower. Since the same lines are used to transmit data to and from the modem, priority is often given to data traveling in one direction.

- **Signal Integrity:** Cable Internet can be transmitted long distances with little signal degradation. This means the quality of the Internet signal is not significantly decreased by the distance of the modem from the cable provider.

- **Routing:** Cable routers allow multiple computers to be hooked up to one cable modem, allowing several devices to be directly connected through a single modem. Wireless routers can also be attached to your cable modem.

- **Rely on Existing Connections:** Cable modems connect directly to preinstalled cable lines. This is advantageous because you do not need to have other services, such as telephone or Internet, in order to receive Internet through your cable modem. The disadvantage is that you cannot have cable internet in areas where there are no cable lines.

Disadvantages

- Cable internet technology excels at maintaining signal strength over distance. Once it is delivered to a region, however, such as a neighbourhood, it is split among that regions subscribers. While increased capacity has diminished the effect somewhat, it is still possible that users will see significantly lower speeds at peak times when more people are using the shared connection.

- Bandwidth equals money, so cable's advantage in throughput comes with a price. Even in plans of similar speeds compared with DSL, customers spend more per Mb with cable than they do with DSL.

- It's hard to imagine, but there are still pockets of the United States without adequate cable

television service. There are far fewer such pockets without residential land-line service meaning cable internet is on balance less accessible in remote areas.

1.4.5 VSAT

Short for very small aperture terminal, an earthbound station used in satellite communications of data, voice and video signals, excluding broadcast television. A VSAT consists of two parts, a transceiver that is placed outdoors in direct line of sight to the satellite and a device that is placed indoors to interface the transceiver with the end user's communications device, such as a PC. The transceiver receives or sends a signal to a satellite transponder in the sky. The satellite sends and receives signals from a ground station computer that acts as a hub for the system. Each end user is interconnected with the hub station via the satellite, forming a star topology. The hub controls the entire operation of the network. For one end user to communicate with another, each transmission has to first go to the hub station that then retransmits it via the satellite to the other end user's VSAT.

Advantages

Satellite communication systems have some advantages that can be exploited for the provision of connectivity. These are:

- Costs Insensitive to Distance
- Single Platform service delivery (one-stop-shop)
- Flexibility
- Upgradeable
- Low incremental costs per unit

Disadvantages

However like all systems there are disadvantages also. Some of these are

- High start-up costs (hubs and basic elements must be in place before the services can be provided)
- Higher than normal risk profiles
- Severe regulatory restrictions imposed by countries that prevent VSAT networks and solutions from reaching critical mass and therefore profitability
- Some service quality limitations such the high signal delays (latency)
- Natural availability limits that cannot be mitigated against

- Lack of skills required in the developing world to design, install and maintain satellite communication systems adequately

1.5 SERVICES OF INTERNET

1.5.1 E-Mail (Electronic Mail)

E-mail or Electronic mail is a paperless method of sending messages, notes or letters from one person to another or even many people at the same time via Internet. E-mail is very fast compared to the normal post. E-mail messages usually take only few seconds to arrive at their destination. One can send messages anytime of the day or night, and, it will get delivered immediately. You need not to wait for the post office to open and you don't have to get worried about holidays. It works 24 hours a day and seven days a week. What's more, the copy of the message you have sent will be available whenever you want to look at it even in the middle of the night. You have the privilege of sending something extra such as a file, graphics, images etc. along with your e-mail. The biggest advantage of using e-mail is that it is cheap, especially when sending messages to other states or countries and at the same time it can be delivered to a number of people around the world.

It allows you to compose note, get the address of the recipient and send it. Once the mail is received and read, it can be forwarded or replied. One can even store it for later use, or delete. In e-mail even the sender can request for delivery receipt and read receipt from the recipient.

Features of E-mail:

- One-to-one or one-to-many communications
- Instant communications
- Physical presence of recipient is not required
- Most inexpensive mail services, 24-hours a day and seven days a week
- Encourages informal communications

Components of an E-mail Address

As in the case of normal mail system, e-mail is also based upon the concept of a recipient address. The email address provides all of the information required to get a message to the recipient from anywhere in the world. Consider the e-mail ID.

john@hotmail.com

In the above example john is the username of the person who will be sending/receiving the email. Hotmail is the mail server where the username john has been registered and com is the type of organization on the internet which is hosting the mail server.

E-mail Message Components

E-mail message comprises of different components: E-mail Header, Greeting, Text, and Signature. These components are described in the following diagram:
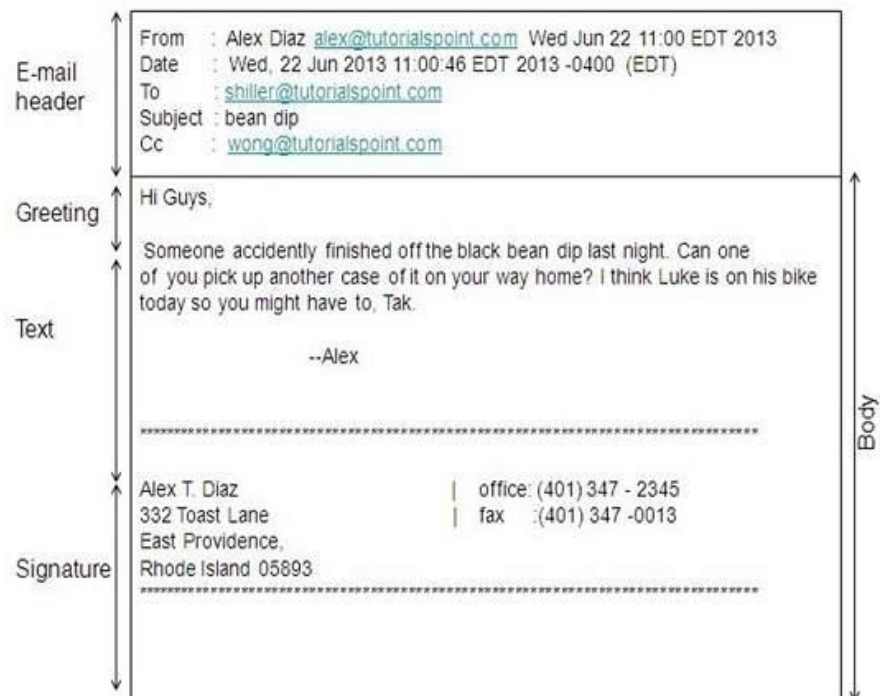
Greeting: Greeting is the opening of the actual message. Eg. Hi Sir or Hi Guys etc.

Text: It represents the actual content of the message.

Signature: This is the final part of an e-mail message. It includes Name of Sender, Address, and Contact Number.

Advantages-

- **Reliable**- Many of the mail systems notify the sender if e-mail message was undeliverable.
- **Convenience**- There is no requirement of stationary and stamps. One does not have to go to post office. But all these things are not required for sending or receiving a mail.
- **Speed**-E-mail is very fast. However, the speed also depends upon the underlying network.

- **Inexpensive-** The cost of sending e-mail is very low.
- **Printable-**It is easy to obtain a hardcopy of an e-mail. Also an electronic copy of an e-mail can also be saved for records.
- **Global**- E-mail can be sent and received by a person sitting across the globe.
- **Generality**-It is also possible to send graphics, programs and sounds with an e-mail.
- **It's free-** Once you're online, there is no further expense.
- **Easy to reference-** Sent and received messages and attachments can be stored safely, logically and reliably. It's a lot easier to organize emails than paper.
- **Easy to prioritize-** Incoming messages have subject lines that mean you can delete without opening.

Disadvantages

Apart from several benefits of E-mail, there also exist some disadvantages as discussed below:
- **Overload**- Convenience of E-mail may result in a flood of mail.
- **Misdirection**- It is possible that you may send e-mail to an unintended recipient.
- **Junk**- Junk emails are undesirable and inappropriate emails. Junk emails are sometimes referred to as spam.
- **No Response:** It may be frustrating when the recipient does not read the e-mail and respond on a regular basis.
- **Emotional responses:** Some emails cause upset or anger. A reply in the heat of the moment can't be easily retracted, but it can cause lasting damage.
- **Misunderstandings:** Emails from people who don't take the time to read what they write before clicking 'send'. Time is wasted, either to clarify or, worse, acting on a misinterpretation of the message.
- **Viruses**- A virus could seriously affect your computer. If you want to know how to use email effectively, it's worth learning how to deal with these.

1.5.2 FTP (File Transfer Protocol)

File Transfer Protocol, is an Internet utility software used to uploaded and download files. It gives access to directories or folders on remote computers and allows software, data and text files to be transferred between different kinds of computers. FTP works on the basis of same principle as that of Client/ Server. FTP "Client" is a program running on your computer that enables you to

communicate with remote computers. The FTP client takes FTP command and sends these as requests for information from the remote computer known as FTP servers. To access remote FTP server it is required, but not necessary to have an account in the FTP server. When the FTP client gets connected, FTP server asks for the identification in terms of User Login name and password of the FTP client (Fig. 3.1). If one does not have an account in the remote FTP server, still he can connect to the server using anonymous login.

Using anonymous login anyone can login in to a FTP server and can access public archives; anywhere in the world, without having an account. One can easily Login to the FTP site with the username anonymous and e-mail address as password.

Objectives of FTP:

- Provide flexibility and promote sharing of computer programs, files and data
- Transfer data reliably and more efficiently over network
- Encourage implicit or indirect use of remote computers using Internet
- Shield a user from variations in storage systems among hosts.

The basic steps in an FTP session

- Start up your FTP client, by typing ftp on your system's command line/'C>' prompt (or, if you are in a Windows, double-click on the FTP icon).
- Give the FTP client an address to connect. This is the FTP server address to which the FTP client will get connected
- Identify yourself to the FTP remote site by giving the Login Name
- Give the remote site a password
- Remote site will verify the Login Name/Password to allow the FTP client to access its files
- Look directory for files in FTP server
- Change Directories if required
- Set the transfer mode (optional);
- Get the file(s) you want, and
- Quit.

1.5.3 Telnet

Telnet or remote computing is telecommunication utility software, which uses available telecommunication facility and allows you to become a user on a remote computer. Once you gain access to remote computer, you can use it for the intended purpose. The TELNET works in a very step by step procedure. The commands typed on the client computer are sent to the local Internet Service Provider (ISP), and then from the ISP to the remote computer that you have gained access. Most of the ISP provides facility to TELENET into your own account from another city and check your e-mail while you are travelling or away on business.

The following steps are required for a TELNET session

- Start up the TELNET program
- Give the TELNET program an address to connect (some really nifty TELNET packages allow you to combine steps 1 and 2 into one simple step)
- Make a note of what the "escape character" is
- Log in to the remote computer,
- Set the "terminal emulation"
- Play around on the remote computer, and
- Quit.

Advantages-

- Telnet client is versatile
- Can be used cross platform.
- Unlimited access to target resources.

Disadvantages-

- Unencrypted data exchange.
- Full access makes it easier for hackers.
- Only few servers can be reached via Telnet.
- It is insecure because it transfers all data in textual form. Which means, if a network was sniffing then it is possible to grab the password and username.

1.5.4 Internet Relay Chat (IRC)

It is an open protocol that allows users with an **IRC** client to exchange text messages in real time over the **Internet**. It is created by *Jarkko Oikarinen* in 1988.

To connect and chat with other IRC users, you must either have an **IRC client** that connects you to IRC servers. There are numerous software IRC clients that enable users to connect and communicate to other IRC servers.

1.5.5. Gopher

It was an Internet application in which hierarchically-organized text files could be brought from servers all over the world to a viewer on your computer. Gopher was a step toward the World Wide Web's Hypertext Transfer Protocol (HTTP), which replaced it within a short time. With hypertext links, the Hypertext Markup Language (HTML), and the arrival of a graphical browser, Mosaic, the Web quickly transcended Gopher. Gopher was developed at the University of Minnesota, whose sports teams are called "the Golden Gophers."

Although most Gopher browsers and files are text-based, Gopher browsers, notably HyperGopher, were developed that displayed graphic images (GIF and JPEG files).

Gopher is an application-layer protocol that provides the ability to extract and view Web documents stored on remote Web servers. It was developed at University of Minnesota.

Gopher was designed to access a Web server or database via the Internet. It requires that files be stored in a menu-style hierarchy on a Gopher server that is accessible through a Gopher-enabled client browser and/or directly. It initially supported only text-based file/document access but later came to support some image formats such as GIF and JPEG.

Gopher was succeeded by the HTTP protocol .Gopher-based databases, servers or websites can be accessed through two search engines: Veronica and Jugead.

1.5.6 ARCHIE

Archie is actually an indexing spider that visits each anonymous FTP site, reads all the directory and file names, and then indexes them in one large index. A user can then query Archie, which checks the query against its index. To use Archie, you can Telnet to a server that you know has Archie on it and then enter Archie search commands. However, it's easier to use a forms interface on the Web called" ArchiePlex".

Archie is often being the Internet's first search engine, but it became less important with the growth of the World Wide Web. It was written in 1990 by *Alan Emtage*, then a postgraduate student at McGill University in Montreal, and Bill Heelan,

Archie was an early search program that allowed users to search for specific files. Archie was created by a team of students at McGill University in 1990 - before the World Wide Web led to the adoption of Hypertext as a means of navigation. Archie helped users find files in the directories of public hosts that they might never have otherwise discovered.

Archie was short for archiver. It ran a script that gathered data from accessible FTP servers and created a database of all the files on publicly accessible FTP sites. This index could then be searched by users, resulting in a list of file matches and the FTP site where it could be found. Archie inspired later search programs called Veronica, but none of these could index the content of a file – just the file name.

1.5.7 Veronica

It was a search engine system for the Gopher protocol. It was released in November 1992 by Steven Foster and Fred Barrie at the University of Nevada, Reno. Veronica is a program similar to Archie that indexed and searched the files on Gopher servers.

During its existence, Veronica was a constantly updated database of the names of almost every menu item on thousands of Gopher servers. The Veronica database could be searched from most major Gopher menus. Although the original Veronica database is no longer accessible. Veronica searches gopher menus on computers across the Internet analogous to the way Archie searches for files available via FTP. Veronica searches menus on many gopher servers. Like Archie veronica requires the user to enter a search string. It then searches for occurrences of the string on all computers that have gopher servers. Veronica is integrated into gopher - a user accesses veronica by selecting a gopher menu item, and the results of a search appear as a gopher menu. The set of computers that contain gopher menus is too large to search each time a user enters a veronica request. To avoid long delays, a computer that offers the veronica service works like Archie. Periodically, a veronica server contacts computers on the Internet and gathers a list of all gopher menus. It stores the list on a disk. When a user selects veronica, the users gopher program contacts a veronica server and sends the search request. The veronica server reaches the list of menu items on its disk to produce an answer, and then sends the answer back.

1.5.8. Web Based Chat Services

Following web sites offers browser based chat services:

Facebook: Lets the users to create personal profile, post status and photos.

Yahoo Messenger: It offers PC-PC, PC-phone, Phone-to-PC, file transfer, webcam hosting, text messaging service etc.

Whatsapp: It is an instant messaging service application available on smart phones.

Gmail: It offers instant chatting, sending and receiving mails, and video calling services.

1.5.9 VoIP

VoIP is short for Voice over Internet Protocol. Voice over Internet Protocol is a category of hardware and software that enables people to use the Internet as the transmission medium for telephone calls by sending voice data in packets using IP.

Some examples of applications that make use of VOIP technology are Whatsapp, Google Phone, Google Group Chat, Facebook Video and Voice Chat and Skype.

1.6 Summary

The **Internet** is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/ IP) to serve billions of users worldwide. For the students and educational purposes, the internet is widely used to gather information so as to do the research or add to the knowledge of various subjects. Even the business professionals and the professionals like doctors, access the internet to filter the necessary information for their use. To connect to the internet, we can use dial up connection or leased connection or DSL connection or Cable modem connection or VSAT. Advantages and disadvantages of each type of connectivity is discussed above. Internet provides many types of services like E-mail, FTP, TELNET, IRC, Veronica, Web based chat services and VoIP.

1.7 Keywords

HTTP: HTTP stands for "Hyper Text Transfer Protocol". The main purpose of this protocol is to define how messages are formatted and transmitted.

URL (Uniform Resource Locator): A URL is the fundamental network identification for any resource connected to the web

Web Browser: A web browser is a software program that allows a user to locate, access, and

display web pages.

ISP: An Internet service provider (ISP) is an organization that provides services for accessing, using, or participating in the Internet

Hypertext Mark-up Language: language used to create documents on the World Wide Web.

File Transfer Protocol: The File Transfer Protocol (FTP) is a standard network protocol used for the transfer of computer files between a client and server on a computer network.

Terminal Network (Telnet): is a protocol that provides a command line interface for communication with a remote device or server.

1.8 Self-assessment Tests

(a) Student Activities

1. Explain in brief different types of internet connection.
2. What are the various services of internet?
3. What is internet? What are its advantages and disadvantages?
4. Discuss the E-mail in detail.
5. Write a short note on FTP and VoIP.
6. Discuss the advantages and disadvantages of E-mail.
7. Discuss the steps required in TELNET session.
8. List the various advantages and disadvantages of TELNET.
9. Explain VSAT with their advantages and disadvantages.
10. Discuss the basic steps required in FTP session.

(b) Learning Activities

1. _____ Communication protocol is used by internet.
2. An organization responsible for providing internet services to customer is commonly known as _____.
3. _____ client software is used to request and display web pages.
4. Google chrome is an example of _____.
5. A web page is located using a _____.
6. In WWW a client is called _____ and a server is called _____.
7. Web pages on a site are linked together through a system of _____.

(c) Feedback of learning activities

Answers of learning activities:

1. TCP/IP

2. ISP

3. Web Browser

4. URL

5. Web Browser and Web server

6. Hyperlinks

1.9 Study Tips

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Course Code: BC- 204	Author: Mr. Balwant Kumar
Lesson : IT and Business: Concepts of Data, Information Technology and Effect of IT on Business	Vetter: Prof. Dharmender Kumar,

LESSON STRUCTURE

2.0   Learning Objective

2.1   Assessment of prior Knowledge

2.2   Meaning of Data and its Characteristics

2.3   Meaning of Information and its Characteristics

2.4   Information Needs at Various Levels of Management

2.5   Factors Affecting Information Needs

2.6   Knowledge

2.7   Information Technology

2.8   Effect of IT on Business

2.9   Summary

2.10   Keywords

2.11   Self-Assessment Tests

2.12   Study Tips

2.0 Learning Objectives

In this chapter you will learn about

- ➢ Definition of data and its characteristics
- ➢ Definition of information and its characteristics
- ➢ Types of information and features of information
- ➢ Need of information at various levels of management
- ➢ Definition of information technology
- ➢ Need of information technology
- ➢ Role of IT in business

- ➢ Benefits of information technology
- ➢ Issues and challenges in information technology
- ➢ Effect of IT on business

2.1   Assessment of prior Knowledge

We live in the information age. In the same way that the development of industry created the industrial age, the development of information technology systems, and especially the internet, has created the information age. It has been a long-held belief by many philosophers that knowledge is power and that knowledge stems from understanding of information; information, in turn, is the assigning of meaning to data. In the following sections data and information is defined according to three types of views:

- • Objective view
- • Subjective view
- • Inter-subjective view

The objective view tends to assume that all data processing will be automated. The subjective view is very different in that it emphasises that if data are processed using a computer, the output is still only more highly structured or reformatted data. The inter-subjective view allows for the possibility that data may be processed either by computer or directly by a person.

To develop learners' understanding of information technology, we start by defining these three related concepts. The topics are hierarchical in that:
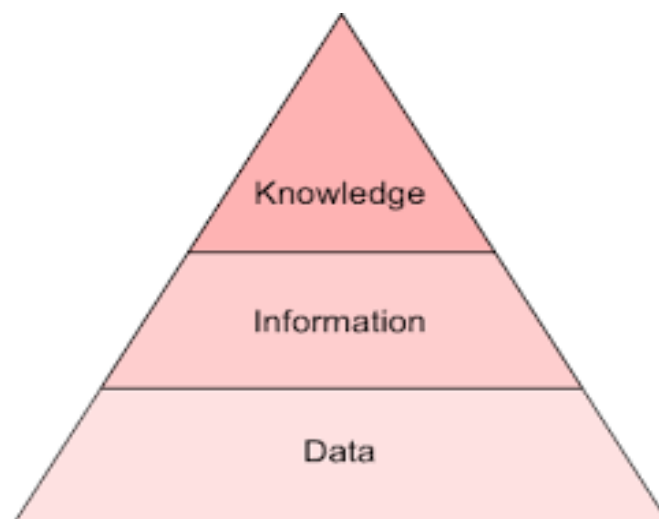
2.2 MEANING OF DATA AND ITS CHARACTERISTICS

2.2.1 Data in Noun form means

- Facts and figures collected together for reference or analysis.
- The quantities, characters, or symbols on which operations are performed by a computer, being stored and transmitted in the form of Information.

> **Example**
> - 3, 6, 9, 12
> - cat, dog, gerbil, rabbit, cockatoo
> - 161.2, 175.3, 166.4, 164.7, 169.3
>
> These are meaningless sets of data. They could be the first four answers in the 3 x table, a list of household pets and the heights of 15-year-old students but without a context we don't know.

The concept of data as it is used in the syllabus is commonly referred to as 'raw' data – a collection of text, numbers and symbols with no meaning. Data therefore has to be processed, or provided with a context, before it can have meaning.

2.2.2 The objective point of view of data

The objective view makes the following assumptions about data.

- They are factual, resulting from recording of measurable events, or objects.
- They record particular instances of reality.
- Introna [1992: 2.42] takes a purely objective view of data, proclaiming them to be *"Aperspectual, ahistorical, acontextual"*.
- They are explicit as they are in a fixed, recorded form.
- Hence, they can be communicated digitally.
- Modern society generates enormous amounts of data that record details of individual events and objects.

- This objective point of view accepts that the data are validated in the sense that they must be measured and recorded accurately. Certain logic checks as to the reasonableness of the data can be done to try to determine whether the data capturing instruments or processes have failed. Data can be shown to be true if they correspond to reality.

The definitions that follow are examples of those that refer only to the objective characteristics of data:

"Data represent unstructured facts." (Avison and Fitzgerald [1995] quoted by Checkland and Holwell [1998])

"*Data: Facts collected from observations or recordings about events, objects or people.*" (Clare and Loucopoulos [1987] quoted by Checkland and Holwell [1998])

"*Data: The raw material of organizational life; it consists of disconnected numbers, words, symbols and syllables relating to the events and processes of the business.*" (Martin and Powell [1992] quoted by Checkland and Holwell [1998])

2.2.3   The subjective point of view of data

On the other hand the subjective view makes the following assumptions about data.

- The data are not necessarily true or accurate as not all errors can be detected automatically and not everyone will necessarily agree that they are a true representation of a particular fact.
- Some data record subjective opinion, not facts. If data can represent opinions and concepts, they are not truly objective.
- Data represent information and are the only way we can make information explicit.
- Nothing but data can be communicated digitally or in any other way. Only data are transmitted, be it by means of a telecommunications medium, in printed form, or directly without using any technology.
- Data have absolutely no meaning. They acquire meaning only when appropriated by a human recipient.

The definitions that follow are examples of those that include subjective aspects. These definitions include characteristics which have been highlighted as being objective or intersubjective as well.

"Data: Natural language: facts given, from which others may be deduced, inferred. Info. Processing and computer science: signs or symbols, especially for transmission in communication systems and for processing in computer systems, usually but not always representing information, agreed facts or assumed knowledge; and represented using agreed characters, codes, syntax and structure." (Maddison [1989] quoted by Checkland and Holwell [1998])

"By themselves, data are meaningless; they must be changed into a usable form and placed in a context to have value. Data becomes information when they are transformed to communicate meaning or knowledge, ideas or conclusions." (Senn [1982] quoted by Introna [1992])

2.2.4   The inter-subjective point of view

- The purpose of data is to permit communication.

- Information exists before data. Some version of that information can be retrieved from the data.

- Data must be recorded in a formalised structure and knowledge of this structure must be shared as prior shared meaning. They cannot be totally unstructured or no-one would ever be able to process them, but they can be reorganised into more complex structures during subsequent processing. The structure will result from language syntax and semantics if the data are in the form of text, or in the case of numeric or symbolic data, will depend on the predesigned layout of database records, forms or even the position of the data on a physical object. (We know something about what a number plate denotes from its position on a car even if the format is unfamiliar.)

- They are represented using agreed characters, codes, syntax and structure. A predetermined, agreed way of coding and decoding must be associated with this representation. A stream of bits is not data unless someone has the key by means of which it can be decoded.

- The fact that data are both recorded and have some structure makes them potentially useful - they are in a form suitable for subsequent interpretation and processing. Other information can be inferred and deduced from them and they can be associated with other data. They have potential meaning.

- They have an implied context and history. If the data have been captured or a procedure exists to capture them, a purpose has already been recognised.

Example definitions:

"*Data: Facts, concepts or derivatives in a form that can be communicated and interpreted.*" (Galland, [1982] quoted by Checkland and Holwell [1998])

"*Data are formalized representations of information, making it possible to process or communicate that information.*" [Dahlbom & Mathiassen, 1995]

2.2.5 Data characteristics

- Data means Facts, statistics used for reference or analysis.
- Data comprises Numbers, characters, symbols, images etc., which can be processed by a computer.
- Data must be interpreted, by a human or machine, to derive meaning.
- Data is a representation of information.
- Data is derived from Latin word 'datum' which means "that which is given".

2.3 MEANING OF INFORMATION AND ITS CHARACTERISTICS

It is important that students learn the concept of what 'information' is as used in information technology. Information is the result of processing data, usually by computer. This results in facts, which enables the processed data to be used in context and have meaning.

Information is Facts provided or learned about something or someone. It can be defined as data that:

- Has been verified to be accurate and timely
- Is specific and organized for a purpose
- Is presented within a context that gives it meaning and relevance, and
- That can lead to an increase in understanding and decrease in uncertainty.

In simple words it means processed data that has some meaning. Data alone are insufficient unless they are processed. Once converted in to information becomes directly applicable. The value of information lies solely in its ability to affect a behavior, decision, or outcome. A piece of information is considered valueless if, after receiving it, things remain unchanged.

2.3.1 The objective point of view

- Information is output from a computer program.

- The systems analyst decides what output will be useful. This output remains useful and meaningful regardless who the recipient is.

- The processing which produces the information includes summarising in order to reduce the volume of data.

- Data may be associated with other data, which may be obtained from different sources, to produce the information.

- The processing (classifying, linking, summarising, sorting, presentation) adds value in the form of potential meaning. The less structured data are less useful and less meaningful than the more structured information.

In the definition that follows "**a** meaning" seems to imply that the meaning is fixed and not open to interpretation and, therefore, this definition refers only to the objective characteristics of information:

"*Information has a meaning ... (it) comes from selecting data, summarizing it and presenting it in such a way that it is useful to the recipient.*" (Avison and Fitzgerald [1995] quoted by Checkland and Holwell [1998])

2.3.2 The subjective point of view

- Data become information only once they have been appropriated by the human recipient. Hence, the output from any computer program is still data.

- The added value of information (compared with data) results from the recipient appropriating the new data, interpreting them and placing them in context by combining them with existing personal information.

- Some authors consider data to be information only if they are used by the recipient in making a decision.

- Data become information only if they include something previously unknown to the recipient.

- Introna considers information to be historical, contextual and perspectival [Introna, 1992]. It is moulded by the life experience to provide understanding.

The definitions that follow are examples of those that include subjective aspects. These definitions also include some characteristics which are considered to be objective or inter-subjective.

"*Information usually implies data that is organized and meaningful to the person receiving it. Data is therefore raw material that is transformed into information by data processing. Information can be defined in terms of its surprise value. It tells the recipient something he did not know.*" (Davis et al [1985] quoted by Introna [1992])

"*Information: (1) Data that has been transformed into a meaningful and useful form for specific human beings. (2) The meaning that a human assigns to data by means of the known conventions used in its representations.*" [Lay et al, 1993]

"*Information is that which results when some human mental activity (observation, analysis) is successfully applied to data to reveal its meaning or significance.*" (Galland [1982] quoted by Checkland and Holwell [1998])

"*Information is the particular instances of reality as experience, perceived or understood by an individual in a specific context.*" [Introna, 1992]

"*... Information comes into being as the receiver appropriates the data and gives it meaning*" [Introna, 1992]

2.3.3   The inter-subjective point of view

- Aspects of shared meaning and discourse (validity claims [Braaten, 1991]) are characteristic of this point of view.
- The recipient has participated in the systems analysis and hence has influenced the process and has said what output was likely to be meaningful to him and others using the system.
- More advanced, database-oriented, systems allow the user to formulate queries and interact directly with the data in the database. Hence, there is a more dynamic process where the user's judgement is combined with the power of the technology.
- Information "has meaning" which can be communicated versus "is meaning" in the objective point of view.

Information must be put into some context "... *in order to understand something, we already need a preliminary understanding of it"* [Dahlbom & Mathiassen, 1995]. This Preliminary understanding must be shared in order for a new shared understanding to result.

preconceptions plus information = interpretation => knowledge

"*To produce information we have to interpret what we experience and make explicit what we know.*" [Dahlbom & Mathiassen, 1995]

2.3.4   Characteristics of Information

- Information is the useful knowledge derived from the data
- Information is knowledge derived from study, experience (by the senses), or instruction.
- Information is any kind of knowledge that is exchangeable amongst people, about things, facts, concepts, etc.,
- In some context "Information is interpreted data".

2.3.5   When does data become information?

Data on its own has no meaning. It only takes on meaning and becomes information when it is interpreted. Data consists of raw facts and figures. When that data is processed into sets according to context, it provides information.

Data refers to raw input that when processed or arranged makes meaningful output. Information is usually the processed outcome of data. When data is processed into information, it becomes interpretable and gains significance.

In IT, symbols, characters, images, or numbers are data. These are the inputs an IT system needs to process in order to produce a meaningful interpretation. In other words, data in a meaningful form becomes information. Information can be about facts, things, concepts, or anything relevant to the topic concerned. It may provide answers to questions like who, which, when, why, what, and how.

If we put Information into an equation it would look like this:

Data + Meaning = Information

2.3.6 Difference between Data and Information

	Data	Information

Definition	In Latin 'datum' means "that which is given".	Information is interpreted data. Data was the plural form of datum singular
Meaning	Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.	When data is processed, organized, structured or presented in a given context so as to make it useful, it is called Information.
Example	Each student's test score is one piece of data	The class' average score or the school's average score is the information that can be concluded from the given data.

2.3.7 How does a computer process data into information?

A computer uses hardware and software in the following four functions to allow it to process data.

Input

Before a computer can process anything, data must receive input. For example, typing on a keyboard can enter input into the computer.

Process

After a computer has received input data, a program is used to process that information. A typical program may calculate, manipulate, or organize the data to create information that is understandable and presentable to the user.

Output

After the data is processed into information, it is displayed as output to the user. For example, the program displays the information on your monitor when you use the Windows Calculator.

Storage

Finally, the computer can store the created information for later use.

A real-life example of how data is processed

As a real-life example of data being processed into information, imagine the following scenario. You open a spread sheet program on your computer and enter the data "1.25" into the first cell. Initially, the computer understands this data only as the floating point number 1.25. But, using the spread sheet program, you can specify the data to be formatted as currency, so the computer understands it as "$1.25" (one dollar and twenty-five cents).

You could input the data ".75" to another cell, and again format it as currency ("$0.75"). Then, you could input a formula in a third cell that adds the values of the information in the first two cells. This formula would return the new information "$2.00." Or, the formula could convert the amount to another currency unit. For instance, if one dollar is worth .89 euros, the formula could convert "$2.00" to the new information "€1.77."

After all of the data is processed, the spread sheet program can save (store) the file, allowing it to be opened again in the future to add additional data.

2.3.8   Features and qualities of information

1. Relevancy: The information so generated should be relevant to the context for which it is collated. Too much irrelevant information may confuse the intended user so it is necessary o generate only relevant information. No information should be generated only because it can be generated by Information System. A good way of ensuring relevance is to closely define the objectives of any information reports. Another way to improve relevance is to produce information that focuses on "exceptions" - e.g. problems, high or low values, where limits have been exceeded.

2. Up-to-date: Information needs to be timely if it is to be actioned upon. For example, a professional need updated information about applicable laws so that he may give relevant advice to his clients. To improve the speed with which information is produced, businesses usually need to look at upgrading or replacing their information systems.

3. Accurate: As far as possible, information should be free from errors (e.g. the figures add up; data is allocated to the correct categories). The users of information should be informed whenever assumptions or estimates have been used.

4. Meet the needs of the User: Since different users have different information needs The managing director doesn't have time to trawl through thick printouts of each week's production or sales listings - he or she wants a summary of the key facts while the quality control supervisor will want detailed information about quality testing results rather than a brief one-line summary of how things are going. It is a good idea to encourage users to help develop the style and format of information reporting that they require.

5. Concise and User Friendly: Information should be clearly presented (e.g. use summaries, charts) and not too long. It also needs to be communicated using an appropriate medium (e.g. email, printed report, presentation. Businesses should also consider developing "templates" which are used consistently throughout the organization

- So that users get used to seeing information in a similar style.

6. worth the cost: Often forgotten. Information costs money. Data is costly to collect, analyse and report. Information takes time to read and assimilate. All users should question whether the information they receive/ have requested is worthwhile.

7. Reliable: Information should come from authoritative sources. It is good practice to quote the source used - whether it is internal or external sources. If estimates or assumptions have been applied, these should be clearly stated and explained.

2.3.9   Types of information

There may be different types of information classifications such as:

➢ Factual vs. Analytical
➢ Objective vs. Subjective

➢ Primary vs. Secondary

Factual Information: These are just the facts. This information is very objective and real. Something that actually exists, reality, truth is a factual information. Examples of factual information are like; Temperature in a city, winner of academy award etc.

Analytical Information: Interpretations, Analysis, Criticism constitute analytical information. To examine critically, so as to bring out the essential elements or give the essence of something, analysis is required. Examples include; Increase of drug use in the 2013, growth in crime rate etc.

Objective Information: Without Bias Non-judgmental "not influenced by personal feelings, interpretations, or prejudices; based on facts". It is to the point, clear cut without any personal projection. Examples of objective information needs: Chronology of the Feminist movement, the eight stages of development according to Erik Erikson

Subjective Information: It includes **o**pinions, personal viewpoints, and evaluations existing in the mind. Examples of subjective information needs include; Criticism of O'Neill's play, Evaluation of a course based on class comments. Book review or movie reviews etc.

Primary Information: Information in its original form, not translated by anyone else, has not been published elsewhere, is termed as primary. Examples of primary information needs: Explanation or instructions from an employer or teacher, an eyewitness account of a house fire, etc.

Secondary Information: It is repackaged examination, restatement or interpretation of primary information already collected by someone. Examples of secondary information needs: Notes borrowed from a classmate for a missed class, a bibliography on the letters of Ernest Hemingway and so on.

Based on it is meant for information may be Personal Information, or Business Information. There can be other classifications as well like, formal vs informal, confirmed vs tentative etc.

2.3.10 Process of generating information

The goal of information generation is to generating information which is reliable, timely, user friendly and meeting the intended user objectives. If it fails to meet the stated objectives it is

considered poor in quality. Therefore information generation requires careful steps so that it serves it purpose. The process basically involves the following steps.

- Understanding the user need in general
- Create framework for generating intended information
- Collecting the data.
- Process or analyse data.
- Collate the result from data, interpret, evaluate.
- Communicate the result of interpretation, evaluation of data in form of Information to intended user.

2.3.11 Value and cost of information

Information is of value to decision makers if it is accurate, timely, complete, and relevant. If it is poor on any of these criteria, it will be less useful hence may not have that value. These four criteria are used to distinguish valuable information from information that is of less value.

Accurate information provides a reliable and valid representation of reality. The cost of inaccurate or distorted information can be extremely high.

Consider the demise of the multimillion dollar Mars Climate Orbiter launched by NASA in 1998. The tragic outcome of this mission was blamed on the failure of one scientific team to recognize and correct an error in information from another team. Findings indicate that one team used English units (e.g., inches, feet and pounds) while the other used metric units for key spacecraft operations affecting navigation. This oversight caused the orbiter to burn up in Mars atmosphere before it could deploy to the surface. Oops.

Timely information is information that is available when it is needed. When information is needed almost always depends on the situation. In the fast-paced world of air travel, commercial airlines need virtually daily updates on what other commercial airlines are doing with their ticket prices. If one airline reduces its airfares from Mumbai Airport to New Delhi Airport, other airlines flying the same route would find out quickly about it and respond in a similar manner.

Complete information tends to be comprehensive in covering the issue or topic of interest. Complete information tells a complete story. Without complete information, a decision maker will

get a distorted view of reality. Incomplete market information can lead businesses to introduce products and services that customers don't want.

Information is relevant if it has significance or can be applied to a specific situation, problem, or issue of interest. Here are some examples of relevant information. Human resource managers need information on hiring and employee turnover; operations managers need information on costs and productivity; marketing managers need information on sales projections and advertising rates; top executives need information on the strategic actions of their competitors. In contrast, product inventory information is not very relevant to a computer programmer.

2.3.12 Information as a corporate resource

Generally human, financial, physical and knowledge factors that provide a corporate the means to perform its business processes are considered as corporate resources.

Information can be considered as the raw material used in producing each and every decision taken in an organization. Organizations need to decide regularly on what objectives to be achieved, what actions to be taken to achieve these objectives, how and when these actions are to be taken, and the resources to be used for all these activities. These decisions are taken by all the people in the organization who work at different level of organizational hierarchy and handle different aspect of the organizational work.

The exact decision that in individual takes varies from person to person and from time to time, depending on nature of organizational tasks being performed. Also some people need to do more of decision making as compared to implementing the decisions. But everyone in the organization needs has to takes some decisions for which availability of adequate information is critical.

Information is also required to convey decisions taken to the people responsible for implementing the decisions taken, and for monitoring the actual results achieved as the work progresses. In want of information many decisions cannot be taken and in some cases it results into poor decisions. Therefore information is acting as a resource, which should be managed, so that needy people may get it in time when required. In this way information plays a role of corporate resource in every organization. Like any other resource it need to be formalized, must have some identified and systematize way of generation and dissemination.

2.4   INFORMATION NEEDS AT VARIOUS LEVELS OF MANAGEMENT

Information is needed for decision making at all levels of management. Managers at different organizational levels make different types of decisions, control different types of processes, and have different information needs.

Three classical levels of management include

- Top Management or Strategic Management
- Middle Management or tactical management
- Low Level Management or Operational Management

Strategic Management includes directors/owner that make decisions which affect the entire organization, or large parts of it, and leave an impact in the long run. The decision making at this level is highly unstructured. By this we mean, there may not be a proper format for decision making. It requires lot of inputs in terms of information, but there is no fixed way of mixing those inputs.

Middle, or tactical, management receive strategic decisions from strategic management as general directives. Using those directives as guidelines, they develop tactics to meet those strategic directives. The decision making at this level is semi structured. Some pieces of information can be mixed to get some conclusion but some amount of ambiguity is always there.

Operational managers are responsible for daily operations. They make decisions concerning a narrow time span about the deployment of small groups of clerical and/or shop floor workers. Generally the decisions at this level are structured in nature.

People in different management levels have different information needs. Most of the information that managers require is used to make decisions. The decision making process of middle managers and above is less structured than that of operational managers; In general, strategic decisions have no proven methods for selecting a course of action that guarantees a predicted outcome.

2.4.1   Information needs of top or Strategic Management

Strategic management or TOP management of a company comprises the owners/managing director of a company. They are responsible for taking strategic decisions for a company which has long term bearing on company policies and perspectives. Strategic management is responsible for making strategic plan which is necessary to take the company on growth path. To prepare strategic Plan, Top management is not concerned about day to day information of company operations. They do the macro analysis and their decisions are based on macro analysis. Generally the Strategic Management information needs comprises

- Information about market trend- Macro analysis.
- Information about Government Policies.
- Information about Competitors policies and tactics
- Information about Major exceptions in implementing the company policy at tactical/operation level.
- Analysis about major happening/event which may have a long term bearing on the strategic decisions of the company

The information need of TOP management is generally unstructured and it not easily defined.

2.4.2 Information needs of Middle Level Management/Tactical Management

Tactical management/Middle Management comprises those who are responsible for preparing annual business plan to achieve the strategic Plan objectives of a company. Tactical Managers prepare Annual Business Plan on the basis of directs received from TOP management. The Information need of middle management comprises

- Information about Strategic Decisions/Plan of the organization for which they have been working.
- Information about Latest Technologies in the area they have been working.
- Information about problems faced by operational management in getting the things implemented.
- Information about best practices adopted by different organization in the same industries or different industries.

The information need of Middle level management is structured in comparison to TOP management and it can be developed in form of template in some cases.

2.4.3 Information needs of Low Level or Operational Management

Operation management is responsible for implementing the policies framed by tactical management to achieve the business plan of the organization. They are generally responsible for the operational part of the organization. The information need of Operational management is limited but very structured in nature. The information need of Operation management needs to be very accurate and it can be easily developed in the form of template

.

2.5 FACTORS AFFECTING INFORMATION NEEDS

There are various factors which affected the information need of him. Some of them are explained as below

1. **Management Hierarchy:** Management Hierarchy plays an important role in deciding the information need of a user. Information need of TOP management will be entirely different from the information needs of Operational Management.

2. **Purpose of seeking information:** The information needs will be depend on the purpose of seeking information. If a person wants to investment in a company, he/she will be interested about the financial statement of the company. He/she will have no interest in knowing about the past directors of the company.

3. **Role in the Organization:** Information need of a person also depend on the role of the concerned user.

The information needs of different stakeholder in the organization will be different. For example, an employee of the organization will be interested in knowing about the company wage policy. They will have no interest in knowing company policy on market segmentation.

2.6 KNOWLEDGE

2.6.1 What is knowledge?

When someone memorises information this is often referred to as 'rote-learning' or 'learning by heart'. We can then say that they have acquired some knowledge. Another form of knowledge is produced as a result of understanding information that has been given to us, and using that information to gain knowledge of how to solve problems.

Knowledge can therefore be:

- acquiring and remembering a set of facts, or
- The use of information to solve problems.

The first type is often called explicit knowledge. This is knowledge that can be easily passed on to others. Most forms of explicit knowledge can be stored in certain media. The information contained in encyclopaedias and textbooks are good examples of explicit knowledge.

Example

Looking at the examples given for data:

- 3, 6, 9, 12
- cat, dog, gerbil, rabbit, cockatoo
- 161.2, 175.3, 166.4, 164.7, 169.3

Only when we assign a context or meaning does the data become information. It all becomes meaningful when we are told:

- 3, 6, 9 and 12 are the first four answers in the 3 x table
- cat, dog, gerbil, rabbit, cockatoo is a list of household pets
- 161.2, 175.3, 166.4, 164.7, 169.3 are the heights of 15-year-old students.

If we now apply this information to gain further knowledge we could say that:

- 4, 8, 12 and 16 are the first four answers in the 4 x table (because the 3 x table starts at three and goes up in threes the 4 x table must start at four and go up in fours)
- A lion is not a household pet as it is not in the list and it lives in the wild.
- The tallest student is 175.3cm.

The second type is called tacit knowledge. It is the kind of knowledge that is difficult to pass on to another person just by writing it down. For example, saying that Paris is the capital of France is

explicit knowledge that can be written down, passed on, and understood by someone else. However, the ability to speak a foreign language, bake bread, program a computer or use complicated machinery requires additional pieces of knowledge (such as that gained through experience) that are not always known explicitly and are difficult to pass on to other users.

2.6.2 How are data, information and knowledge linked?

If we put Knowledge into an equation it would look like this:

Information + application or use = Knowledge

2.7 INFORMATION TECHNOLOGY

Information is a resource which has no value until it is extracted, processed and utilized. Information technology deals with information system, data storage, access, retrieval, analysis and intelligent decision making. Information technology refers to the creation, gathering, processing, storage, presentation and dissemination of information and also the processes and devices that enable all this to be done.

It can be extremely beneficial for all business owners to have some basic level of awareness about information technology. The advent of information technologies based on computers has enabled business models to understand that they may function as subsets of information technology. Information technology is a study of the design, implementation, development, management, and support of computer-based information systems that assist with supporting business operational needs within an industry.

2.7.1 IT in the Past

The term information technology was first coined by Thomas L. Whisler and Harold J. Leavitt in a 1958 article published in the Harvard Business Review. At that time, the term IT was used only to describe the process of storing information.

At the time, there was no such thing as a degree or certificate in information technology and businesses had no need for large IT departments. There were no interconnected networks, server

farms, or complex computer systems. Phone, fax, and regular mail were the main communication media.

2.7.2 Modern Use of Information Systems

These days, the vast majority of businesses wouldn't survive without the use of information systems. They are sending internal emails, marketing via the web, managing e-commerce web sites, and storing and tracking data online. From the big conglomerates to the smallest home businesses, there's no doubt that companies all over the world rely heavily on information.

2.7.3 The Necessity of Information Technology

Information technology is a broad field. It is concerned with all aspects of managing and processing electronic information, especially in the business world, where computers are vital for data management. In today's competitive environment, almost every company's business strategy relies on the use of information systems in order to succeed and grow into the future. For this reason, IT professionals are valued members of the organizations they're involved in, and the need for certified IT experts continues to increase.

2.7.4 More Specifically Information Technology Means

- Managing a network of computers.
- Creating original web pages.
- Producing videos digitally.
- Designing computer systems as a consultant.
- Vendors selling products on the internet.
- Designing 3D artwork.
- Administering a company's database.
- Coding software.
- Providing technical support.
- Managing projects and budgets.
- Writing technical documentation.

2.7.5 Examples of Information Technology Are

- Telephone and radio equipment and switches used for voice communications.
- Traditional computer applications that include data storage and programs to input process and output the data.
- Software and support for office automation systems such as word processing and spread sheets, as well as the computer to run them.
- User, PCs & software.
- Data networks and all associated communications equipment such as servers, bridges, routers, hubs & wiring.
- Peripherals directly connected to computer information systems used to collect or transmit audio, video or graphic information, such as scanners and digitizers.
- Voice response systems that interact with a computer database or application.
- Video conferencing equipment.
- The state radio communications network.
- Computers and network systems used by teachers, trainers and students for educational purpose.
- "Open" computer systems that monitor or automate mechanical or chemical processes and also store information used by computer applications for analysis and decision making.
- All operating costs, equipment and staff time associated with supporting the technology infrastructure of the agency, possibly including items excluded above, such as video equipment used for technology training that is included in the information systems costs center for the agency.

2.7.6 Role of IT in businesses

Information technology covers many different areas, including software solutions and hardware that allow organizations and companies to organize, gather, and evaluate data. Ultimately, the analysis of this data helps companies achieve their goals. This also includes workflow processes that can expand an organization's capacity to grow revenue. The bottom line for many business owners is that revenue growth and profit margins are key drivers for performance and efficiency. There are four primary elements for information technology as a whole: information security,

database and network management, computer technical support, and business software development.

Some businesses may be under the impression that information technology is only a minor part of running the company and achieving goals. This can be a big mistake. The IT industry is always evolving with new software and hardware applications. For many companies, information technology is most present in their concern for network security. Network security is vital for preventing system breaches. Many various data breaches for companies large and small have made headlines in recent years, and yet a surprising number of companies still have not adapted their own systems and procedures to prevent these attacks.

Another reason that today's business world must be aware of information technology has to do with data overloads. Many businesses are processing high volumes of data every single day, and without appropriate processing capability, this can overload a system easily. IT professionals play a key role in helping business owners address problems immediately in front of the company, as well as achieving goals down the road. Teamwork and clear communication skills are at the top of the list in a desirable information technology professional. The IT professional of the day helps to translate complicated concepts in the information technology world to meaningful results for those using the technology in their daily working lives. As such, businesses have to remain aware of the basics behind IT.

Reduce Operating Costs

Small business owners can use technology to reduce business costs. Basic enterprise software enables a firm to automate back office functions, such as record keeping, accounting and payroll. Mobile technology allows home offices to interact in real time.

Securing Sensitive Information

Business owners can also use technology to create secure environments for maintaining sensitive business or consumer information. Many types of business technology or software programs are user-friendly and allow business owners with only minor backgrounds in information technology to make the most of their tools and features.

Improved Communication Processes

Business technology helps small businesses improve their communication processes. Emails, texting, websites and apps, for example, facilitate improved communication with consumers. Using several types of information technology communication methods enable companies to saturate the economic market with their message. Companies may also receive more consumer feedback through these electronic communication methods.

Technology also improves inter-office communication as well. For example, social intranet software gives employees a centralized portal to access and update internal documents and contracts and relay relevant data to other departments instantly. These methods also help companies reach consumers through mobile devices in a real-time format.

Increased Employee Productivity

Small businesses can increase their employee's productivity through the use of technology. Computer programs and business software usually allow employees to process more information than manual methods. Business owners can also implement business technology to reduce the amount of human labor in business functions. This allows small businesses to avoid paying labor costs along with employee benefits.

Business owners may also choose to expand operations using technology rather than employees if the technology will provide better production output.

Broaden Customer Bases

Technology allows small businesses to reach new economic markets. Rather than just selling consumer goods or services in the local market, small businesses can reach regional, national and international markets. Retail websites are the most common way small businesses sell products in several different economic markets.

Collaboration and Outsourcing

Business technology allows companies to outsource business functions to other businesses in the national and international business environment. Outsourcing can help companies lower costs and focus on completing the business function they do best. Technical support and customer service are two common function companies outsource.

Small business owners may consider outsourcing some operations if they do not have the proper facilities or available manpower.

2.7.7 Issues and Challenges in Information Technology

- As computing systems and capabilities continue expanding worldwide, "data overload" has become an increasingly critical issue for many IT professionals. Efficiently processing huge amounts of data to produce useful business intelligence requires large amounts of processing power, sophisticated software, and human analytic skills.
- Teamwork and communication skills have also become essential for most businesses to manage the complexity of IT systems. Many IT professionals are responsible for providing service to business users who are not trained in computer networking or other information technologies but who are instead interested in simply using IT as a tool to get their work done efficiently.
- System and network security issues are a primary concern for many business executives, as any security incident can potentially damage a company's reputation and cost large sums of money.

2.8 EFFECT OF IT ON BUSINESS

The rise of information technology has paved the way for various innovations. With the digitization of information, more and more businesses are increasingly leveraging the benefits of digital tools to improve their prospects. Information technology has been crucial in turning this process into a complete success.

Information technology has dramatically transformed the lives of individuals. It provides businesses the scope to analyse data and plan business strategies accordingly. Utilizing information technology means that the data analysis is accurate, thus optimizing profits.

Information technology has had a major impact on various aspects of businesses. Let's take a look at some of these here.

1. Cloud Computing

The concept of cloud computing is immensely popular among businesses owing to the efficiency in business operations that it provides. Cloud computing utilizes information technology to capitalize on its ability to provide improved agility and time and resource management for businesses.

Increasingly, businesses are shifting to the cloud to leverage its many benefits. It has been predicted that more than $1 trillion will be impacted in IT spending by the transition of businesses to cloud computing by 2020.

2. Automation of Business Processes

The movement towards increased automation of business processes improves efficiency and increases workflow considerably.

Information technology helps in developing automated processes for businesses. This not only helps in reducing the cost of operation but also saves time. The time saved can be utilized to focus on other tasks, thus speeding up business processes significantly.

Processes like billing, tracking metrics, collecting customer data, monitoring certain processes etc. can be automated easily. There are various automation software that can be utilized for this purpose.

3. Working Remotely

Implementation of information technology provides the ability to remotely access your company's network. As a result, it equips employees with the ability to get the work done even if they are not physically present at the workplace. Therefore, it has gained massive popularity.

4. Mobile Technology

Mobile technology takes business communication to a whole new level. A mobile team can improve the workplace productivity considerably. There are numerous ways to integrate mobile technology in the workplace.

5. Protecting Information

Every organization has database comprising various information related to business transactions, client details and so on. Such information is extremely valuable to a business and can cause a legal issue if it is lost. This is where information technology becomes relevant. It provides the right resources to store the information in a way that ensures maximum protection.

Therefore, information technology helps in upholding business integrity.

6. Providing Customer Satisfaction

Customer experience and satisfaction are crucial aspects of all businesses. The key to customer satisfaction is a strong customer support team and its availability to cater to the requirements of the customers. Information technology provides the best tools for communicating with customers and solving their problems in real time. It has unlocked the facilities like Email, social media and other messaging platforms for this purpose.

7. Management of Resources

A business has a variety of resources. These may include financial resources, human resources and so on. For large organizations, managing resources becomes quite difficult. Information technology plays a vital role in managing these resources effortlessly by introducing a wide range of feasible solutions.

For example, the integration of Enterprise Resource Planning (ERP) has improved the efficiency of various business processes. ERP is business management software that enables an organization to use a series of integrated applications that can manage and automate various business operations.

8. Open Source Software

Information technology has paved the way for various open source software that allow free usage of certain tools for various organizations. The primary benefit of open source software is its flexible license. This allows modifications to the source code. This means that you have the facility to customize its functions according to your requirements.

2.9 SUMMARY

Information is a resource which has no value until it is extracted, processed and utilized. Information technology deals with information system, data storage, access, retrieval, analysis and intelligent decision making. It can be extremely beneficial for all business owners to have some basic level of awareness about information technology. Information technology is a study of the design, implementation, development, management, and support of computer-based information systems that assist with supporting business operational needs within an industry. Information technology covers many different areas, including software solutions and hardware that allow organizations and companies to organize, gather, and evaluate data. Ultimately, the analysis of this data helps companies achieve their goals. This also includes workflow processes that can expand an organization's capacity to grow revenue. Utilizing information technology means that the data analysis is accurate, thus optimizing profits.

2.10 KEYWORDS

Data: The quantities, characters, or symbols on which operations are performed by a computer, being stored and transmitted in the form of Information.

Information: Information is the useful knowledge derived from the data.

Information Technology: The study or use of systems (especially computers and telecommunications) for storing, retrieving, and sending information.

Knowledge: Facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.

Cloud Computing: The practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.

Mobile Computing: Mobile computing is a generic term that refers to a variety of devices that allow people to access data and information from wherever they are. Mobile computing transports data, voice, and video over a network via a mobile device.

2.11 Self-assessment Tests

(a) **Student Activities**

1. What is data and explain its characteristics.
2. What is information? What are the differences between Data and Information?

3. Explain the needs of information for different levels of managements, in detail.

4. Discuss the various factors affecting the information needs.

5. What is knowledge? How is knowledge different than information?

6. What is information technology (IT)? What are the various advantages of IT?

7. Discuss the effects of IT on Business.

8. Discuss the various challenges for IT in detail.

9. Explain the role of IT in business.

10. Discuss the factors affecting the information needs.

(b) Learning Activities

1. The hardware, software and media used to store, organize, retrieve and communicate information is known as _____.

2. _____ is a generic term that refers to a variety of devices that allow people to access data and information from wherever they are.

3. _____ is the useful knowledge derived from the data

4. Information in its original form, not translated by anyone else, has not been published elsewhere, is termed as _____.

5. Data + _____ = Information

(c) Feedback of learning activities

Answers of learning activities:

1. Information technology

2. Mobile computing

3. Information

4. Primary

5. Meaning

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LESSON STRUCTURE

3.0   Learning Objectives

3.1   Assessment of prior Knowledge

3.2   Information System

3.3   Pyramid Diagram of Organizational Levels and Information Requirements

3.4   Functions of Information System

3.5   Types of Information System

3.6   Why Businesses use Information System

3.7   Cause of Information System Failure

3.8   Transaction Processing System

3.9   Management Information System (MIS)

3.10   Summary

3.11   Keywords

3.12   Self-Assessment Tests

3.13   Study Tips

3.0   Learning Objectives

The value of information is directly linked to how it helps decision makers achieve the organization's goals. In this chapter you will learn about-

- Definition of information and types of information.
- Relation between information, knowledge and intelligence.
- Organizational levels and their required information.
- Functions of an information system
- Types of information system
- Use of information system in business
- Causes of information system failure
- Transaction Processing System

- Management Information System

3.1 Assessment of prior Knowledge

It is often observed that term information system and information technology are used interchangeably. In a literal sense, information technology is a subset of information systems. Information systems consist of people, processes, machines and information technology. The great advancement in information systems is due to development in information technology and introduction of computers. Section 3.2.1 explains some basic concepts of information system. This section defines information, various types of information, a variety of methods for collecting information (such as interview, focus group, observation, surveys) and system along with its components. Section 3.3 introduces information system with its needs. After that structure of an organization along with their corresponding information needs is represented by a pyramid diagram. Section 3.5 explains various functions of information system and section 3.6 describe types of information system i.e. Transaction Processing system, Management Information System, Decision Support System, Executive Support System, Office Automation System, Business Expert System. Section 3.7 explains use of information system and 3.8 describe cause of information system. Section 3.9 explains Transaction Processing System with its processing cycle and various types of transactions. Section 3.10 explains Management Information System and comparative study of manual information system and MIS, components of MIS, Characteristics of MIS, advantages and disadvantages.

3.1.1 Basic concepts

Information-Collection of facts organized in such a way that they have additional value beyond the value of the facts themselves.

According to Davis and Olson: "Information is a data that has been processed into a form that is meaningful to recipient and is of real or perceived value in the current or the prospective action or decision of recipient."

Information can only be considered to be 'real' Info if it meets certain criteria i.e.

1. It must be communicated to the recipient
2. It must be in a language that is understood
3. It must be in a suitable form
4. It must be relevant for achieving some purpose

3.1.2   Types of information- Information could be classified on the basis of the purpose for which it is utilized, into three main categories:

- **Strategic information**-it is required by the managers at the strategic level of management for the formulation of organizational strategies.
- **Tactical information**-information in this category is used in short term planning and is of use at management control level.
- **Operational information**-it applies to short periods which may vary from an hour to a few days.

3.1.3   Information Collection Techniques

In order to determine the requirements of a system, information must be gathered from the customer. Ideally, the information obtained will enable a well-defined, accurate, and complete description of how the business functions as well as the people, functions and data involved. However, this is not always the case, and information is often misinterpreted or omitted entirely. There are many techniques that can be employed when gathering information. The type of information you are trying to obtain, as well as the people providing the information, will determine which techniques you should use.

- ✓ **Focus group**
  - o Used to explore a topic in depth with key stakeholders to learn what the common understanding is on various issues.
- ✓ **Case Studies**
  - o A case study is a thorough description of a process, structure, or experience at one organization. Case studies use surveys, statistics about usage, and qualitative data collection techniques. While performing a research quantitative data is gathered first and then the qualitative strategies are used.
- ✓ **Observation**
  - o Observation is a data collection technique that is performed by monitoring or viewing the subject.
  - o Sometimes observations are performed continuously or in a set of time periods. There can be different types of observations like structured, unstructured, and semi-structured.

- o The limitation of observations is that it consumes time and it affects the behavior of the participants.
- ✓ **Interviews**
  - o An interview is another data collection technique.
  - o For collecting the data through this technique, interviews are performed in groups or on a one-on-one basis. During interviews, the data can be collected using stenography, video recordings, audio recordings, or written notes.
- ✓ **Surveys**
  - o Surveys are performed through questionnaires. A standard set of questions are used for performing the survey of any specific topic.

3.1.4 System

In a system, network of components work towards a single objective, if there is lack of co-ordination among components, it leads to counterproductive results.

PARTS OF A SYSTEM
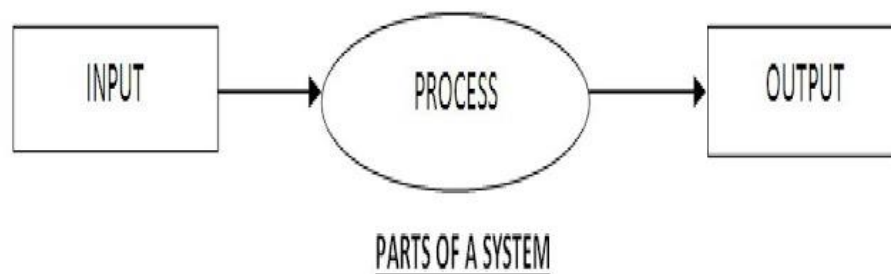
A system may have following features:

✓ **Adaptability:** some systems are adaptive to the exterior environment, while some systems are non-adaptive to the external environment. For example, anti-lock braking system in car reacts depending on the road conditions, whereas the music system in the car is independent of other happening with the car.

✓ **Limitation:** every system has pre-defined limits or boundaries within which it operates. This limits or boundaries can be defined by law or current state of technology.

3.2 INFORMATION SYSTEM

Information system is an <u>integrated</u> set of components for collecting, storing and processing data and for providing <u>information</u>, knowledge, and digital products. Business firms and other organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, and compete in the marketplace.

3.2.1 Need of information system

Information systems gain their importance by processing the data from company inputs to generate information that is useful for managing your operations. To increase the information system's effectiveness, you can either add more data to make the information more accurate or use the information in new ways.

Business Communication Systems

Part of management is gathering and distributing information, and information systems can make this process more efficient by allowing managers to communicate rapidly. Email is quick and effective, but managers can use information systems even more efficiently by storing documents in folders that they share with the employees who need the information. This type of communication lets employees collaborate in a systematic way.

Each employee can communicate additional information by making changes that the system tracks. The manager collects the inputs and sends the newly revised document to his target audience.

Business Operations Management

How you manage your company's operations depends on the information you have. Information systems can offer more complete and more recent information, allowing you to operate your company more efficiently. You can use information systems to gain a cost advantage over competitors or to differentiate yourself by offering better customer service. Sales data give you insights about what customers are buying and let you stock or produce items that are selling well. With guidance from the information system, you can streamline your operations.

Company Decision-Making

The company information system can help you make better decisions by delivering all the information you need and by modelling the results of your decisions. A decision involves choosing a course of action from several alternatives and carrying out the corresponding tasks. When you have accurate, up-to-date information, you can make the choice with confidence.

If more than one choice looks appealing, you can use the information system to run different scenarios. For each possibility, the system can calculate key indicators such as sales, costs and profits to help you determine which alternative gives the most beneficial result.

Company Record-Keeping

Your company needs records of its activities for financial and regulatory purposes as well as for finding the causes of problems and taking corrective action. The information system stores documents and revision histories, communication records and operational data. The trick to exploiting this recording capability is organizing the data and using the system to process and present it as useful historical information. You can use such information to prepare cost estimates and forecasts and to analyse how your actions affected the key company indicators.
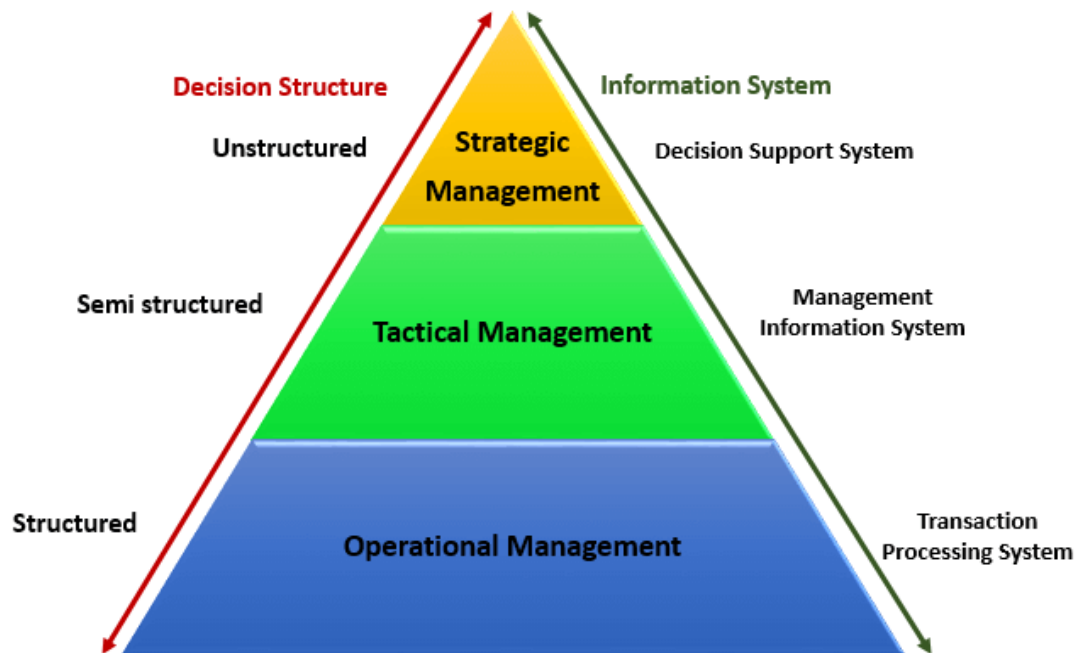
3.3 PYRAMID DIAGRAM OF ORGANIZATIONAL LEVELS AND INFORMATION REQUIREMENTS

Understanding the various levels of an organization is essential to understand the information required by the users who operate at their respective levels.

3.3.1 Operational management level

- The operational level is concerned with performing day to day business transactions of the organization.

- Examples of users at this level of management include cashiers at a point of sale, bank tellers, nurses in a hospital, customer care staff, etc.

- Users at this level use make structured decisions. This means that they have defined rules that guide them while making decisions.

The following diagram illustrates the various levels of a typical organization.

Decision Structure — Information System

Unstructured — **Strategic Management** — Decision Support System

Semi structured — **Tactical Management** — Management Information System

Structured — **Operational Management** — Transaction Processing System

3.3.2 Tactical Management Level

- This organization level is dominated by middle-level managers, heads of departments, supervisors, etc. The users at this level usually oversee the activities of the users at the operational management level.

- Tactical users make semi-structured decisions. The decisions are partly based on set guidelines and judgmental calls. As an example, a tactical manager can check the credit limit and payments history of a customer and decide to make an exception to raise the credit limit for a particular customer. The decision is partly structured in the sense that the tactical manager has to use existing information to identify a payments history that benefits the organization and an allowed increase percentage.

3.3.3 Strategic Management Level

- This is the most senior level in an organization.

- The users at this level make unstructured decisions.

- Senior level managers are concerned with the long-term planning of the organization. They use information from tactical managers and external data to guide them when making unstructured decisions.

3.4   FUNCTIONS OF INFORMATION SYSTEM

One of the mostly widely used bases for organizing activities in almost every organization is the business function. Business activities are grouped around functions such as production, marketing, finance and personnel etc. resulting in the respective department or an area of the business organization. These departments or functional areas are commonly known as the functional areas of business.

There is no standard classification of such sub-system in an organization, but a typical set of functions in a manufacturing organization includes:

- Production
- Marketing
- Finance and accounting
- Materials and
- Personnel systems

Production:
➢ planning and control
➢ Engineering standards
➢ Quality control
➢ R & D etc.

Marketing:
➢ Sales order
➢ Forecasting
➢ Sales analysis
➢ Billing
➢ Distribution
➢ Stock availability
➢ Sales quota control
➢ Pricing
➢ Product promotion.

Finance and accounting:
➢ Financial planning

- ➤ Budgeting
- ➤ Cost accounting
- ➤ Asset accounting
- ➤ Accounts receivable
- ➤ Payroll Accounts
- ➤ Payable, etc...

Materials:
- ➤ Material planning
- ➤ Bill of material
- ➤ Cost estimate
- ➤ Warehousing planning etc...

Personnel:
- ➤ Employee recruitment
- ➤ Employee selection
- ➤ Employee development
- ➤ Employee transfers
- ➤ Employee retirements etc.

3.5 TYPES OF INFORMATION SYSTEM

The classifications of information system are-

3.5.1 Transaction processing system.

In manufacturing organization, there are several types of transaction across department. Typical organizational departments are Sales, Account, Finance, Plant, Engineering, Human Resource and Marketing. Across which following transaction may occur sales order, sales return, cash receipts, credit sales; credit slips, material accounting, inventory management, depreciation accounting, etc. These transactions can be categorized into batch transaction processing, single transaction processing and real time transaction processing. Other details of TPS are given later in this chapter

3.5.2 Management information system.

Managers require precise information in a specific format to undertake an organizational decision. A system which facilitates an efficient decision making process for managers is called management support system.

Management support systems are essentially categorized as management information system, decision support system, expert system and accounting information system.

Management information system provides information to manager facilitating the routine decision-making process. Decision support system provides information to manager facilitating specific issue related solution.

3.5.3   Decision support system.

The Decision support system (DSS) is an information system application that assist decision making. Decision support systems tend to be designed primarily to serve management control level and strategic planning level managers. The data in the database typically is a combination of master files (internal corporate data) and from external sources.

3.5.3.1 Features of DSS

- **Adaptability and flexibility**
- **High levels of Interactivity** DSS are computer-based systems designed for interactive use by decision makers or staff users who control the sequence of interaction and the operations performed.
- **Ease of use**
- **Efficiency and effectiveness** DSS are intended to improve the accuracy, timeliness, quality and overall effectiveness of a specific decision or a set of related decisions. It provides a single platform that allows all users to access the same information and access the same version of truth, while providing autonomy to individual users and development groups to design reporting content locally. DSSs are intended to improve the accuracy, timeliness, quality and overall effectiveness of a specific decision or a set of related decisions.
- **Complete control by decision-makers** they are not intended to replace decision makers, instead a DSS can support decision makers at any level in an organization.
- **Ease of development** as a standalone, integrated, and Web-based systems, a DSS delivers an interactive, scalable platform for rapidly developing and deploying projects. Multiple projects can be created within a single shared meta-data. Within each project, development teams

create a wide variety of re-usable meta-data objects. Most DSSs will allow for extendibility, support for modelling and analysis and support for data access.

3.5.3.2 Benefits of DSS

- Improves efficiency and speed of decision-making activities.
- Increases the control, competitiveness and capability of futuristic decision-making of the organization.
- Facilitates interpersonal communication.
- Encourages learning or training.
- Since it is mostly used in non-programmed decisions, it reveals new approaches and sets up new evidences for an unusual decision.
- Helps automate managerial processes.

3.5.3.3 Disadvantages of Decision Support Systems

- **Information Overload:** A computerized decision making system may sometimes result in information overload. Since it analyses all aspects of a problem, it leaves a user in a dilemma what to consider and what not to consider. Not each bite of information is necessary in decision making. But when it's present, a decision maker finds it difficult to ignore information that is not a priority.

- **Too much Dependence on DSS:** It is true that decision support systems are integrated into businesses to make everyday decisions faster and more easily. Some decision makers develop a tendency to depend too much on computerized decision making and don't want to apply their own brains. Clearly, there is a shift in focus and decision makers may not hone their skills further because of excessive dependence on DSS.

- **Devaluation of Subjectivity:** A decision support system promotes rational decision making by suggesting alternatives basis the objectivity. While bounded rationality or restricted irrationality plays a critical role in decision making, subjectivity cannot and should not be rejected. A DSS promotes objectivity and relegates subjectivity, which can have serious impact on a business.

- **Overemphasis on Decision Making:** Clearly the focus of computerized decision making is on considering all aspects of a problem all the time, which may not be required in many of the situations. It is essentially important to train the users to ensure effective and optimal use of DSS.

- **Cost of Development:** The cost of decision making decreases once a decision support system is installed. But development and implementation of a DSS requires a huge monetary investment. Customization may attract higher cost. If you're on a tight budget, you might not get a customized DSS specific to your needs.

3.5.4 Executive support system

Executive support system (ESS) is an extension of the management information system which is a special kind of DSS. An ESS is specially tailored for the use of chief executive of an organization to support his decision making. An ESS is designed to cater to the information needs of a chief executive keeping in view not only his requirements but also taking into account his personality and style of functioning etc.

3.5.4.1 Characteristics of ESS

❖ **Informational characteristics**
1. Flexibility and simple use.
2. Provides the timely info with the short reaction time and additionally with the short retrieval.
3. Produces the proper info.
4. Produces the relevant info.
5. Produces the valid info.

❖ **User interface/orientation characteristics**
1. Consists of the subtle self-facilitate.
2. Contains the user friendly interfaces consisting of the graphic user.
3. Will be used from several places.
4. Offers secure reliable, confidential access in conjunction with the access procedure.
5. Suites the management forms of the individual executives.

❖ **Social control / Govt. characteristics**
1. Supports the overall vision, mission and also the strategy.
2. Provides the support for the strategic management.
3. Typically helps to manage the things that have a high degree of risk.
4. Is coupled to the worth accessorial business processes.
5. Supports the need/ access for/ to the external data/ databases.

3.5.4.2 Advantages of EIS

- Easy for upper-level executives to use, extensive computer experience is not required in operations
- Provides timely delivery of company summary information
- Information that is provided is better understood
- Filters data for management
- Improves to tracking information
- Offers efficiency to decision makers

3.5.4.3 Disadvantages of EIS

- System dependent
- Limited functionality, by design
- Information overload for some managers
- Benefits hard to quantify
- High implementation costs
- System may become slow, large, and hard to manage
- Need good internal processes for data management
- May lead to less reliable and less secure data

3.5.5   Office automation system

Office automation refers to the application of computer and communication technology to office functions. Office automation systems are meant to improve the productivity of managers at various level of management by providing secretarial assistance and better communication facilities. Office automation systems are the combination of hardware, software and people in information systems, that process office transactions and support office activities at all levels of the organization. These systems include a wide range of support facilities, which include word processing, electronic filing, electronic mail, message switching, data storage, data and voice communication etc.

3.5.5.1 Characteristics

- Sophisticated process that consists of electronic equipment and communication systems.

- Involves and integrates people, procedure, and technology.
- Involves the use of computers, in conjunction with other electronic equipment.
- Consists of word processors and other essential documenting and presentation designing software connected to one another through means of a local area network or cloud drive.
- Designed as a multi-function information system to provide executives some decision support tools.
- Supports a large number of software packages working by integrating with each other.

3.5.5.2 Advantages and Disadvantages of Office Automation

Office automation today is much more than just document producing, storage and retrieval. Electronic and digital information is the crux of modern office automation. It may include strictly internal computers, high-end management software, a worldwide digital network through the internet or off-site cloud storage. Implementing the new office automation system in your office comes with its own set of advantages and disadvantages.

The Advantages are:

- **Values Time and Company Resources:** Your company's most valuable assets are time and its resources. The good performance of your company starts with using these two effects. Office automation allows you to communicate with people via emails, chats, fax, etc., and send text, image, audio, and video files digitally to anyone inside the office or outside in any part of the world. This way you can also save your resources that otherwise would have been spent on travel to meet people for information or file sharing.
- **Reduces Direct Involvement in Regular Works:** It reduces your workload on regular office tasks such as creating reports and organizing all sorts of data. Spread sheets allow you to enter, compile, and store bulk data for future reference. Spread sheets also help reduce the workload and keep your office in order.
- **Faster, and You Can Rely on Its Accuracy:** Everything from creation, editing, and sharing of documents and all sorts of data is way faster with office automation. Also, machines and software combined together give results that are highly accurate. For example, you can add up numbers in spread sheets and create budgets and it will always come up with accurate balance.
- **Reduces Cost of Operation with Lesser Workforce:** From ledger work to a more extensive task like managing company's facilities inside or outside the office, office automation allows you to hire only a selected number of people to manage all sorts of work through its digital

dashboards. It helps by lowering the cost of operation and increased dependency on manpower for even the pettiest of works.

Like any other system in the world, office automation system too has some issues however; they seem to be not-so-worrying to anyone who is using it. Let's have a look on the issues that exist with office automation.

- **Chances of System Failure, But No Data Loss:** Minor glitches are common, not in frequency but in the form of errors that are usually reported. A complete system failure is a rare phenomenon. Office automation technology isn't new. It has already been through the time and testing for so long. By keeping up with the updates, and software and hardware meltdowns, you can easily avoid a shutdown. Also, even if a shutdown couldn't be avoided, you still don't need to worry about your company data. If you have installed a cloud-based technology, your data will be safe which you can re-access right after the system restart.

- **First Time Installation Is Expensive:** Obviously, if you are installing everything afresh, it has to cost you dearly. A professional office suite and machines, their installation, training for use, and fixing of the initial issues, are the areas where you have to dig your pocket. You should think about the long-term benefits your company will be drawing out from automation after this one-time expense.

3.5.6 Business expert system

Business expert system (BES) is a knowledge based information system that uses its knowledge about a specific, complex application area to act as an expert. This system is one of the knowledge based information system. Expert system provides decision support to managers in the form of advice from an expert in a specific problem area. Expert systems find application in diverse areas, ranging from medical, engineering and business.

3.5.6.1 Characteristics of an expert system:

- Human experts are perishable but an expert system is permanent.
- It helps to distribute the expertise of a human.
- One expert system may contain knowledge from more than one human experts thus making the solutions more efficient.
- It decreases the cost of consulting an expert for various domains such as medical diagnosis.

- They use a knowledge base and inference engine.
- Expert systems can solve complex problems by deducing new facts through existing facts of knowledge, represented mostly as if-then rules rather than through conventional procedural code.
- Expert systems were among the first truly successful forms of artificial intelligence (AI) software.

3.5.6.2 Limitations:
- Don't have human-like decision making power.
- Can't possess human capabilities.
- Can't produce correct result from less amount of knowledge.
- Requires excessive training.

3.5.6.3 Advantages:
- Low accessibility cost.
- Fast response.
- Not affected by emotions unlike humans.
- Low error rate.
- Capable of explaining how they reached a solution.

3.5.6.4 Disadvantages:
- Expert systems have no emotions.
- Common sense is the main issue of the expert system.
- It is developed for a specific domain.
- It needs to be updated manually. It does not learn itself.
- Not capable to explain the logic behind the decision.

3.6 WHY BUSINESSES USE INFORMATION SYSTEM

Many businesses today do not make use of internet which is very important in this day. Upgrading the computer information system is not an option in this technology-driven era, it is essential. The follow are reasons why businesses need to use information systems.

1. **Operational excellence:**

In order for a business to achieve high levels of profitability, they need to improve the efficiency of their operations. Information systems are a tool that is used in order to achieve high levels of efficiency and productivity in business operations.

2. **New Products, Services and Business Models:**

   Information systems can be used to create new products and services and also an entirely new business model. A business model describes how a company produces, delivers and how they sell a product or service to create wealth.

3. **Customer/Supplier Intimacy:**

   When a business provides a good product or service customers tend to return and purchase more frequently which raises revenue and profits. The more a business engages with its suppliers, the better the supplier can provide vital inputs which can lower costs.

4. **Improved Decision-Making:**

   Many managers in an information bank may never have the right information at the right time to make an informed decision. This can raise costs and lose customers. However, information systems allow the managers to use real-time data from the marketplace when making decision.

5. **Competitive Advantage:**

   When a firm achieved one or more of these business objectives (operational excellence, new products, services and business models, customer/supplier intimacy and improved decision-making), they may have a competitive advantage. By performing better than competitors, charging less for superior goods and responding to customers and suppliers, higher sales and profits can be made.

6. **Day To Day Survival:**

   Businesses must invest in information systems and technology as they are essential to doing business. Information system enables companies to react, respond, cater, store, retrieve, disseminate and control their new valuable asset that is information. In the future, a good information system in a business will no longer be an option; it will become a compulsory in determining success.

3.7   CAUSE OF INFORMATION SYSTEM FAILURE

The British Computer Society defines information systems as "software that has been written to support human activity within an organization". So at what point can we say that an information system has failed? Well an information system has failed when it:

- Goes way over budget
- Is not operational at a specific time
- Does not do what it was intended to do
- Does not fit in the organizational structure or work processes

Information system failure is not caused by just technological difficulties but also human resource issues and the functionality within a business.

Organizations need to be aware of the causes of information system failure because unfortunately failure rates are very high, much higher than success rate. The harsh reality is most projects are destined to fail before they even begin.

3.7.1 Here are some causes of Information system failure in

- Requirements do not represent the actual needs of the customer.
- Improper planning
- Lack of and poor communication
- Requirements are incomplete or conflicting. have problems understanding and communicating with each other.
- Both a lack of proper leadership and poor leadership
- Unrealistic expectations
- Inability to keep within the budget

3.8   TRANSACTION PROCESSING SYSTEM

An information system that processes data arising from the occurrence of business transactions is known as transaction processing system.

➢ Transaction processing systems (TPS) are aimed at improving the routine business activities on which all organizations depend.

➢ A transaction is any event or activity that affects the organization which occur as part of doing business, such as sales, purchases, deposit, withdrawals, refunds and payments.

➢ Common transactions include placing orders, billing customers, hiring employees, and depositing cheques.

- The types of transactions that occur vary from organization to organization.
- Transaction processing, the set of procedures for handling the transactions, often includes the activities like calculation, storage and retrieval, classification, summarization, sorting.
- Transaction processing procedures are often called standard operating procedures.

When you purchase a book from an online bookstore, you exchange money (in the form of credit) for a book. If your credit is good, a series of related operations ensures that you get the book and the bookstore gets your money. However, if a single operation in the series fails during the exchange, the entire exchange fails. You do not get the book and the bookstore does not get your money.

The technology responsible for making the exchange balanced and predictable is called transaction processing. Transactions ensure that data-oriented resources are not permanently updated unless all operations within the transactional unit complete successfully. By combining a set of related operations into a unit that either completely succeeds or completely fails, you can simplify error recovery and make your application more reliable.

Transaction processing systems consist of computer hardware and software hosting a transaction-oriented application that performs the routine transactions necessary to conduct business. Examples include systems that manage sales order entry, airline reservations, payroll, employee records, manufacturing, and shipping.

3.8.1 Types of Transactions

Note that the transactions can be internal or external. When a department orders office supplies from the purchasing department, an **internal transaction** occurs, when a customer places an order for a product, an **external transaction** occurs.

Internal Transactions: Those transactions, which are internal to the company and are related with the internal working of any organization. For example Recruitment Policy, promotion Policy, production policy etc.

External Transactions: Those transactions, which are external to the organization and are related with the external sources, are regarded as External Transaction. For example sales, purchase etc.

3.8.2 Transaction Processing cycle

Transaction processing systems capture and process data describing business transactions. Then they update organizational files and databases and produce a variety of information products for internal and external use.

Transaction processing systems generally go through a five-stage cycle of

1. Data Entry: - The input activity in transaction processing systems involves a data entry process. In this process, data is captured, or collected by recording, coding, and editing activities. Then the data may be converted to a form that can be entered into a computer system. Data entry activities have always been a bottleneck in the use of computers for transaction processing.

2. Transaction Processing: - Transaction processing systems process data in two ways.

a) Batch processing - In a batch processing system, transaction data is accumulated over a period of time and processed periodically. For example paying by cheque.

Advantages of Batch Processing

➢ Control over time of processing

➢ Standardization

➢ Reduce setup and processing cost

Disadvantages of Batch Processing

➢ Time delay in gathering data , storing and bulk processing

➢ Operation cost may increase

➢ Only identical is processed in one batch

➢ Errors are corrected after processing the data

b) Real-time processing- real time processing is where all details of transactions are recorded and changed at the time as it occurs. For example- ATM.

Advantages of Real Time Processing

➢ Error correction can be immediate

➢ Data is processed as demand

➢ No time delay

Disadvantages of Real Time Processing

➢ Standardization may not exist or may be more difficult

➢ Processing needs make control difficult

➢ System hardware and software is expensive

➢ Security is critical

3. File and database processing-

An organizations database must be updated by its transaction processing system so that they are always correct and up-to-date. Therefore, Transaction processing system serve to assist in maintaining the corporate database of an organization to reflect changes resulting from day-to-day business transaction.

4. Document and report generation-

Transaction processing system generates a number of documents and reports. Eg of transaction documents are purchase order, sales receipt, customer statement.

Transaction reports might take the form of a transaction listing such as a payroll register, edit reports that describe errors detected during processing.

5. Enquiry Processing-

Many transaction processing system allow you to use internet, extranet, intranet and web browser or database management query languages to make enquiry and receive responses concerning the result of transaction processing activity. Typically responses are displayed in a variety of formats.

Examples of transaction processing systems include;

- **Point of Sale Systems** – records daily sales
- **Payroll systems** – processing employee's salary, loans management, etc.
- **Stock Control systems** – keeping track of inventory levels
- **Airline booking systems** – flights booking management

3.9   MANAGEMENT INFORMATION SYSTEM (MIS)

The MIS is an idea which is associated with man, machine, marketing and methods for collecting information's from the internal and external source and processing this information for the purpose of facilitating the process of decision-making of the business.

MIS is not new, only the computerization is new before computers MIS techniques existed to supply managers with the information that would permit them to plan and control business operations. The computer has added on more dimensions such as speed, accuracy and increased volume of data that permit the consideration of more alternatives in the decision-making process. The scope and purpose of MIS is better understood if each part of them is defined individually, thus

Management: Management has been defining in processor activities that describe what managers do in the operation for their organization plan, organize, initiate and control operations. They plan by setting strategies and goals and selecting the best course of action to achieve the goals. They organize the necessary tasks for the operational plan, set these tasks up into homogenous groups and assign authority delegation; they control the performance standards and avoiding deviation from the standard.

The decision-making is a fundamental prerequisite of each of the foregoing process, the job of MIS is facilitating decisions necessary for planning, organizing and controlling the work and functions of the business so that specified goals of the business are achieved.

Information: Data must be distinguished from information and the distinction is clear and important for the present purpose. Data are facts and figures that are not currently being used in a decision-making process and usually are taken from the historical records that are recorded and filled without immediate intent to retrieve for decision-making.

Information consists of data that have been retrieved, processed or otherwise used for information or interference purpose, argument or as a basis forecasting or decision-making regarding any business unit. Information is the knowledge that one derives from facts for the effective functioning of systems placed in the right context with the purpose of reducing uncertainty regarding the alternative courses of action as they are based on description and measurement of attributes of various entities associated with the enterprise.

System: The system can be described as a set of elements joined together for a common objective. A subsystem is a part of a larger system with which one is concerned. All systems for our purpose the organization is the system and the parts (divisions, departments, functions, unit, etc) are the subsystems.

The system concept of MIS is, therefore one of optimizing the output of the organization by connecting the operating subsystems through the medium of information exchange. The Management information system (MIS) is a concept of the last two decade or two. It has been understood and described in a number of ways. It is also known as the Information System, the Information and Decision System, the computer-based Decision System.

Information is the lifeblood of an organization, particularly in the case of system approach management. The MIS or Information system can be defined as the knowledge communicated by others or obtained from investigation or study. It is a system providing needed information to each

manager at the right time in the right form and relevant one which aids understanding and stimulates the action. MIS is an organized method of providing past, present and projection information relating to internal operations and externals intelligence. It supports the planning, control and operational functions of an organization by furnishing uniform information in the proper time frame to help the process of decision-making.

Management Information System is generally defined as an integrated user-machine system for providing information to support operations, management and decision-making functions in an organization. The system utilizes computer hardware and software, manual procedure, models for analysis. Information is viewed as a resource much like land, labor, and capital. It must be obtained processed, stored, manipulated and analyzed, distributed, etc. An organization with a well-defined information system will generally have a competitive advantage over an organization with poor MIS and no MIS.

The MIS has more than one definition, some of which are given below:

1. The MIS is defined as a system which provides information support for decision-making in the organization.

2. The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision-making function in the organization.

3. The MIS is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.

4. The MIS is defined as a computer-based information system.

Though there are a number of definitions all of them converge on a single point, i.e. the MIS is a system that supports the decision-making function of the organization. The difference lies in defining the elements of MIS. However, in today's world, the MIS is a computerized business processing system generating information for the people in the organization to meet the information needs for decision-making to achieve the corporate objective of the organization.

✓ MIS is a computer-based system that provides flexible and speedy access to accurate data. The organizational information system which in general relates to the planning, operation and control of an enterprise is the most important among them. MIS refers primarily to such an organizational system which is generally large, sophisticated, structured and dynamically

evolving and of immense commercial values. A large number of programs and system analysts are employed by many organizations to build a variety of MIS. Thus, the education of programmers and system analysts as well as general manager, the subject of MIS, has occupied a key position.

✓ Thus, MIS is a set of computer-based system and procedures implemented to help managers in their routine job of decision-making and planning, expansion and development.

✓ The objective of MIS is to provide information for a decision support process of management. It should help in such a way that the business goals are achieved in the most efficient manner. Since the decision-making is not restricted to a particular level, the MIS is expected to support all the levels of the management in conducting the business operations. Unless the MIS becomes a management aid, it is not useful to the organization.

✓ Modern management system relies on MIS, the complexity of business management and the competitive nature of business requires handling of business operations with skill and foresight to avert the crisis. The management process is executed through a variety of decisions taken at each step of planning, organizing, staffing, directing, coordinating and controlling. If the management is able to spell out the decision required to be taken, then the MIS is designed suitably.

✓ The actual MIS process relates to:
- A. Collection
- B. Organization
- C. Distribution
- D. Storage of wide information
- E. Managerial control and analysis of data

✓ Management Information Systems (MIS) are used by tactical managers to monitor the organization's current performance status. The output from a transaction processing system is used as input to a management information system.

3.9.1 Why MIS?

A manager has to take decisions with two main challenges:

First, a manager has to take quick decisions, or else there's a chance of the business being taken over by his competitors. The liberalization and globalization, in which organizations are required to compete globally, has further enhanced the necessity for such a system.

Second, information is doubling up every two or three years, a manager has to process a large voluminous data; failing which he may end up taking a strong decision that may prove to be very costly to the company.

Hence, Management Information System has proved to be the one of the most important in today's business environment.

3.9.2 Manual Information Systems VS Computerized Information Systems (MIS)

Data is the bloodstream of any business entity. Everyone in an organization needs information to make decisions. An information system is an organized way of recording, storing data, and retrieving information.

In this section, we will look at manual information systems vs. computerized information systems.

3.9.2.1 Manual Information System

A manual information system does not use any computerized devices. The recording, storing and retrieving of data is done manually by the people, who are responsible for the information system. The following are the major components of a manual information system

- **People** –people are the recipients of information system
- **Business Procedures** –these are measures put in place that define the rules for processing data, storing it, analysing it and producing information
- **Data** –these are the recorded day to day transactions
- **Filing system** – this is an organized way of storing information
- **Reports** –the reports are generated after manually analysing the data from the filing system and compiling it.

Advantages and Dis-advantages of a manual information system

Advantages:

The following are the advantages of manual information systems

- **Cost effective** – it is cheaper compared to a computerized system because there is no need to purchase expensive equipment such as servers, workstations, printers, etc.
- **Flexible** –evolving business requirements can easily be implemented into the business procedures and implemented immediately

Disadvantages:

The following are some of the disadvantages of a manual information system.

- **Time consuming** –all data entries need to be verified before filing, this is a time consuming task when done by humans. Retrieving data from the filing system also takes a considerable amount of time
- **Prone to error** – the accuracy of the data when verified and validated by human beings is more prone to errors compared to verification and validation done by computerized systems.
- **Lack of security** – the security of manual systems is implemented by restricting access to the file room. Experience shows unauthorized people can easily gain access to the filing room
- **Duplication of data** –most departments in an organization need to have access to the same data. In a manual system, it is common to duplicate this data to make it easy to accessible to all authorized users. The challenge comes in when the same data needs to be updated
- **Data inconsistency** – due to the duplication of data, it is very common to update data in one file and not update the other files. This leads to data inconsistency
- **Lack of backups** – if the file get lost or mishandled, the chances of recovering the data are almost zero.

3.9.2.2 Computerized information system

Computerized systems were developed to address the challenges of manual information systems. The major difference between a manual and computerized information system is a computerized system uses a combination of software and hardware to record, store, analyze and retrieve information.

3.9.3 Examples of management information systems include;

1) **Sales management systems** – they get input from the point of sale system
2) **Budgeting systems** – gives an overview of how much money is spent within the organization for the short and long terms.
3) **Human resource management system** – overall welfare of the employees, staff turnover, etc.

3.9.4 Important roles of the MIS:

- MIS satisfies the diverse needs through a variety of systems such as Query System, Analysis System, Modelling System and Decision Support System.
- It helps in strategic planning, management control, operational control and transaction processing.

- It helps in the clerical transaction processing.

- It answers the queries on the data pertaining to the transaction, the status of a particular record and reference on a variety of documents.

- MIS for Junior Management: Providing the operational data for planning, scheduling and control, and helps them further in decision-making at the operation level to correct an out of control situation.

- MIS for Middle Management: In short-term planning, target setting and controlling the business functions which is supported by the use of the management tools of planning and control.

- MIS for Top- Level Management: in goal setting, strategic planning and evolving the business plans and their implementation.

- It plays the role of information generation, communication, problem identification and helps in the process of decision-making.

In conclusion, organizations today just cannot survive and grow without properly planned, implemented and maintained MIS.

3.9.5 Competitive advantage of information and MIS

Competitive advantage is a position that makes a business more profitable than its competitors. For example, producing products at a lower cost than your competitors makes you more profitable. Information systems have the capacity to help an organization into such a position. They do so in the following ways:

Operational excellence – operational excellence seeks to improve the operations of the business. Let's take an example of a retail store. A retail store can use information systems to automatically place an order with a supplier once the inventory level reaches the re-order limit. This ensures that the retail store never runs out of inventory and customers can always count on it to find what they need.

New business models, products, and services – let's continue with the example of a retail store. The retail store can develop a web based order system or smart phone application that clients can use to buy items from the comfort of their homes or wherever they are. The order system can be linked to a delivery business and have support for online payments. This is a new business model compared to customers walking in to make purchases vs doing it from web based or smart phone apps.

Improved supplier and customer relations – historical data is used to understand the needs of the customers and suppliers. This data is then used to create services and products that address the needs. This leads to long-term relationships with customers and business which puts an organization in a more profitable position.

Improved decision making – information is critical when making decisions. Information systems if designed and operated efficiently then outputs information that has all the characteristic of good information that described in the above section. This enables an organization to make decisions that will profit the organizations.

3.9.6   Components of MIS and their relationship

A management information system is made up of five major components namely people, business processes, data, hardware, and software. All of these components must work together to achieve business objects.

People – these are the users who use the information system to record the day to day business transactions. The users are usually qualified professionals such as accountants, human resource managers, etc. The ICT department usually has the support staff that ensures that the system is running properly.

Business Procedures – these are agreed upon best practices that guide the users and all other components on how to work efficiently. Business procedures are developed by the people i.e. users, consultants, etc.

Data – the recorded day to day business transactions. For a bank, data is collected from activities such as deposits, withdrawals, etc.

Hardware – hardware is made up of the computers, printers, networking devices, etc. The hardware provides the computing power for processing data. It also provides networking and printing capabilities. The hardware speeds up the processing of data into information.

Software – these are programs that run on the hardware. The software is broken down into two major categories namely system software and applications software. System software refers to the operating system i.e. Windows, Mac OS, and Ubuntu, etc. Applications software refers to specialized software for accomplishing business tasks such as a Payroll program, banking system, point of sale system, etc.

3.9.7 Following are the key characteristics of MIS:

1. **System approach:** MIS follows the system approach, which implies a step by step approach to the study of system and its performance in the light of the objective for which it has been constituted. It means taking an inclusive view at sub-systems to operate within an organization.

2. **Management-oriented:** The management-oriented characteristic of MIS implies that top-down approach needs to be followed for designing MIS. A top-down method says the initiation of system development determines management requirements as well as business goals. MIS implies the management dynamically to the system development towards the completion of management decision.

3. **As per requirements:** The design and development of MIS should be as per the information required by the managers. The required design and development information is at different levels, viz., strategic planning, management control and operational control. It means MIS should cater to the specific needs of managers in the hierarchy of an organization.

4. **Future-oriented:** The design and development of MIS should also be future purpose so that the system is not restricted to provide only the past information.

5. **Integrated:** A complete MIS is a combination of its multiple sub-components to provide the relevant information to take out a useful decision. An integrated system, which blends information from several operational areas, is a necessary characteristic of MIS.

6. **Common data flows:** This concept supports numerous basic views of system analysis such as avoiding duplication, combining similar functions and simplifying operations. The expansion of common data flow is a cost-effectively and logical concept.

7. **Long-term planning:** MIS should always develop as a long term planning because it involves logical planning to get success of an organization. While developing MIS, the analyst should keep future oriented analysis and needs of the company in mind.

8. **Relevant connection of sub-system planning:** The MIS development should be decomposing into its related sub-systems. These sub-systems must be meaningful with proper planning.

9. **Central database:** it contains data in tabular form. The data base is responsible to operations like insertion, deletion, updating of records. This database covers information related to inventory, personnel, vendors, customers, etc. the data stored in the database.

3.9.8 Advantages:

The following are the advantages of computerized information systems

- **Fast data processing and information retrieval** – this is one of the biggest advantages of a computerized information system. It processes data and retrieves information at a faster rate. This leads to improved client/customer service

- **Improved data accuracy** – easy to implement data validation and verification checks in a computerized system compared to a manual system.

- **Improved security** – in addition to restricting access to the database server, the computerized information system can implement other security controls such as user's authentication, biometric authentication systems, access rights control, etc.

- **Reduced data duplication** – database systems are designed in such a way that minimized duplication of data. This means updating data in one department automatically makes it available to the other departments

- **Improved backup systems** – with modern day technology, backups can be stored in the cloud which makes it easy to recover the data if something happened to the hardware and software used to store the data

- **Easy access to information** – most business executives need to travel and still be able to make a decision based on the information. The web and Mobile technologies make accessing data from anywhere possible.

3.9.9 Disadvantages:

- **It is expensive to set up and configure** – the organization has to buy hardware and the required software to run the information system. In addition to that, business procedures will need to be revised, and the staff will need to be trained on how to use the computerized information system.

- **Heavy reliance on technology** – if something happens to the hardware or software that makes it stop functioning, then the information cannot be accessed until the required hardware or software has been replaced.

- **Risk of fraud** – if proper controls and checks are not in place, an intruder can post unauthorized transactions such as an invoice for goods that were never delivered, etc.

3.10 SUMMARY

MIS is the acronym for Management Information System. It is a collection of people, procedures, data, and information technology that aids managers to make informed decisions. Computerized information systems are more efficient compared to manual information systems. Manual information systems are cheaper compared to computerized information systems. Transaction processing systems (TPS) are used by operational staff to record day to day business transactions, and they are used to make structured decisions. Management Information Systems (MIS) are used by middle-level managers to make semi-structured decisions. Decision Support Systems are used by top level managers, and they help top level managers to make unstructured decisions.

3.11 KEYWORDS

Information System: An information system is the information and communication technology (ICT) that an organization uses, and also the way in which people interact with this technology in support of business processes.

Transaction processing system: An information system that processes data arising from the occurrence of business transactions is known as transaction processing system.

Management information system: A management information system (MIS) is a computer system consisting of hardware and software that serves as the backbone of an organization's operations. An MIS gathers data from multiple online systems, analyses the information, and reports data to aid in management decision-making.

Decision support system: A decision support system (DSS) is a computerized program used to support determinations, judgments, and courses of action in an organization or a business.

3.12 Self-assessment Tests

(a) Student Activities

1. What do you mean by information system, explain in detail?
2. Explain the Transaction processing system.
3. Write short note on Management information system. Discuss various advantages and disadvantages of MIS.
4. Discuss the various features of decision support system.
5. What are the various characteristics of Executive support system?
6. What is Business expert system? Explain its characteristics.
7. Discuss "why do we require an information system for our business?"
8. Explain the various causes of information system failure.

9. Discuss the key characteristics of MIS.

10. Discuss the competitive advantages of information and MIS.

(b) Learning Activities

1. _____ is required by the managers at the strategic level of management for the formulation of organizational strategies.

2. An information system that processes data arising from the occurrence of business transactions is known as _____.

3. _____ are used by top level managers, and they help top level managers to make unstructured decisions.

4. _____ is a collection of people, procedures, data, and information technology that aids managers to make informed decisions.

5. _____ are by operational staff to record day to day business transactions, and they are used to make structured decisions.

(c) Feedback of learning activities

Answers of learning activities:

1. Strategic information

2. Transaction processing system

3. Decision Support Systems

4. Management information system

5. Transaction processing systems

3.13 Study Tips

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Subject: E-Commerce	
Course Code: BC- 204	Author: Mr. Balwant Kumar
Lesson : E-Commerce: Concept, WWW and Application Services	Vetter: Prof. Dharmender Kumar,

LESSON STRUCTURE

4.0   Learning Objectives

4.1   Assessment of prior Knowledge

4.2   Types of E-Commerce

4.3   **E-Commerce Architecture**

4.4   WWW

4.5   Applications of E-Commerce

4.6   **Advantages**

4.7   Disadvantages of E-Commerce

4.8   Summary

4.9   Keywords

4.10   Self-Assessment Tests

4.11   Study Tips

4.0 Learning Objectives

➢ How the term E-commerce has been defined,

➢ What are the goals and scope of E-commerce

➢ What are the different methods to use E-commerce?

➢ About the scope of E-commerce.

➢ Application of www for E-commerce.

➢ About World Wide Web

➢ The benefits of getting your business into using e-commerce at one or more levels

➢ Which technical and economical challenges have to be faced when doing business electronically?

4.1 Assessment of prior Knowledge

This chapter introduces you about the paperless exchange of business information- known as "E-Commerce". The World Trade Organization defines e-commerce as, "e-commerce is the production, distribution, marketing, sales or delivery of goods and services by electronic means." E-Commerce is commonly referred as electronic commerce. It is also known as "Internet Commerce". It refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions.

Michael Aldrich in 1979 invented online shopping to enable online transaction processing between consumers and businesses, or between one business and another, a technique known later as e-commerce.

In traditional commerce, communication/transactions are done in synchronous way. Manual intervention is required for each communication or transaction. Now with e-commerce, communication or transactions can be done in asynchronous way. The whole process is completely automated.

It takes place between companies, between companies and their customers, or between companies and public administrations. Section 4.2.1 states basic concepts about E-commerce. Section 4.2.2 states objectives of E-commerce in our daily life. In addition to usage of e-Commerce specified in section 4.2.3, there are some benefits provided to organization, society, and customers are also specified in section 4.2.4 of this chapter. Section 4.3 states about **WWW**. A broader definition comes from the World Wide Web Consortium (W3C): "The World Wide Web is the universe of network-accessible information, an embodiment of human knowledge."

4.1.1 E- Commerce

E-commerce is a business model or a larger business model that allows companies or individuals through the electronic network.

Electronic commerce is subdivided into three categories: business to business in B2B, business to consumer or B2C and consumer to consumer or C2C. What is B2B (Business To Business)? B2B is a type of between manufacturers and wholesalers or wholesalers and retailers. Business to business refers to the business between the company rather than the company and personal consumption. What is B2C (Business to Customer)? B2C is also the trading between consumers. What is C2C (Customer to Customer)? C2C is the promotion and interaction between benefit and

customer. Customer to customer is to provide location and talk to people, exchange and trading with other people.

4.1.2 Goals of E-Commerce-

- Reduce cost
- Reduce product cycle time
- Faster customer response
- Improve service quality
- Attract more customer

4.1.3 Usage of Electronic Commerce:

1. Send letters, documents, orders, or advertising material around the world, almost instantaneously and low cost;

2. Create a store-front on the Internet so that people around the world can find and access your business · Buy or sell around the world via the Internet - do business with anyone, anywhere in the world at any time;

3. Provide better information and services to businesses and consumers;

4. Streamline your business processes and reduce costs.

It is also called a '**Virtual Market Place'**.

4.1.4 Benefits of E-Commerce-

1. **Benefits to Organization-**
   - E-Commerce decreases the cost of creating, Processing, distributing, storing and retrieving paper based information.
   - E-Commerce reduces the time.
   - Improved customer service.
   - Improved image.

2. **Benefits to Consumer-**
   - Customer can perform a transaction 24 hours per day.
   - It provides customers with more choices
   - It allows quick delivery
   - Customer can communicate with each other through electronic communication

- It provides customer with less expensive products

3. **Benefits to Society-**
   - It reduce the time of travelling for shopping
   - Its facilitates people in rural areas to enjoy product and services
   - It facilitates delivery of public services

4.1.5 Methods of using of E-Commerce

E-commerce can be used in following ways

- **Electronic Data Interchange (EDI)-** Electronic data interchange (EDI) is the most commonly used B2B e-commerce technology today. It is the computer-to-computer exchange of business documents, such as purchase orders and invoices, in a standard electronic format between business partners.

- **Electronic Mail (e-mail)-** Electronic mail (also called email or e-mail) is the transmission of messages over communications networks. Most email systems include an editor for composing messages and then you send the message by specifying the recipient's email address.

- **Electronic Bulletin Boards**-Electronic bulletin boards (also known as message boards or as computer forums) are online communication systems where one can share, request, or discuss information on just about any subject.

- **Electronic Fund Transfer (EFT)**-*Electronic funds transfer* (*EFT*) are *electronic transfer* of money from one bank account to another, either within a single financial institution or across multiple institutions, via computer-based systems, without the direct intervention of bank staff.

- Other Network-based technologies

4.1.6 Scope of E-commerce
- Marketing, sales and sales promotion.

- Pre-sales, subcontracts, supply.

- Financing and insurance.

- Commercial transactions – ordering, delivery, payment.

- Product service and maintenance.

- Co-operative product development.

- Distributed co-operative working.

- Use of public and private services.

- Business-to-administrations

- Transport and logistics.

- Public procurement.

- Automatic trading of digital goods like games, learning material, songs and music etc.

- Accounting and financial management.

- Legal advice

4.2   TYPES OF E-COMMERCE

Electronic commerce can be classified into following main categories. The basis for this simple classification is the parties that are involved in the transactions. So the six basic electronic commerce models are as follows,

- Business-to-Business (B2B)
- Business-to-Consumer (B2C)
- Consumer-to-Consumer (C2C)
- Consumer-to-Business (C2B)
- Business-to-Administration (B2A)
- Consumer-to-Administration (C2A)

Business-to-Business (B2B): This kind of E-commerce consists of all the electronic transactions and dealings related to the goods and services. These basically are conducted between companies and include conventional wholesalers and producers dealing with retailers.

Business-to-Consumer (B2C): The Business-to-Consumer E-commerce is related to the transactions and relationship between businesses and the end customers. This is mainly to do with the retail E-commerce trade that takes place online. With the inception of the internet, B2C E-commerce has evolved to a great extent. Today, we find scores of electronic shopping sites and

virtual stores on the web, that sell myriad products, ranging from computers, fashion items to even necessities.

In this case, the customer has more info about the products in the form of informative content and there is also a chance to buy products at cheaper rates. Most times, quick delivery of the order is also maintained.

Steps in B2C E-commerce

1. Customer uses a browser and locates vendor or he has vendor's webpage address

2. Sees Vendor's web page listing of items available, prices etc

3. Customer selects item and places order. Order may include credit card details or may be cash on delivery

4. Vendor checks with credit card company customer's credit

5. Credit card company OKs transaction

6. Vendor acknowledges Customer's order and gives details of delivery date, mode of transport, cost etc

7. Vendor orders with distributor who ships item to vendor's warehouse from where item supplied to customer

8. Customer's credit card company debits his account, credits vendor's account and sends bill to customer for payment.

Consumer-to-Consumer (C2C): This consists of electronic transactions of products and services between two customers. These are mainly conducted through a third party that provides an online platform for these transactions. Sites, where old items are bought and sold, are examples of C2C E-commerce.

Consumer-to-Business (C2B): In this, a complete reversal of the selling and buying process takes place. This is very relevant for crowd sourcing projects. In this case, individuals make their items or services and sell them to companies. Some examples are proposals for company site or logo, royalty free photographs, design elements and so on.

Business-to-Administration (B2A): In this kind of E-commerce transaction, there are dealings between companies and public administration. It encompasses different services, such as social security, fiscal measures, legal documents, employment and so on.

Consumer-to-Administration (C2A): In this E-commerce model, electronic transactions are carried between individuals and public administration. Some examples are distance learning, information sharing, electronic tax filing, and so on.

The main objective of both the B2A and C2A types of E-commerce is to increase flexibility, efficiency, and transparency in public administration.

4.3   E-COMMERCE ARCHITECTURE

- E-commerce is based on the client-server architecture.

- A client can be an application, which uses a Graphical User Interface (GUI) that sends request to a server for certain services.

- The server is the provider of the services requested by the client.

- In E-commerce, a client refers to a customer who requests for certain services and the server refers to the business application through which the services are provided.

- The business application that provides services is deployed on a Web' server.

- The E - Commerce Web server is a computer program that provides services to "other computer programs and serves requested Hyper Text Mark-up Language (HTML) pages or files.

- In client-server architecture, a machine can be both a client as well as a server.

There are two types of client server architecture that E-commerce follows: two-tier and three-tier.

4.3.1   E- Commerce System Architecture: Two-tier architecture:

In two-tier client-server architecture the user interface runs on the client and the database is stored on the server. The business application logic can either run on the client or the server. The user application logic can either run on the client or the server. It allows the client processes to run separately from the server processes on different computers.

The client processes provide an interface for the customer that gather and present the data on the computer of the customer. This part of the application is known as presentation layer. The server processes provide an interface with the data store of the business.

This part of the application is known as data layer. The business logic, which validates data, monitors security and permissions and performs other business rules, can be kept either on the client or the server. The following Figure shows the e commerce system two-tier architecture diagram.
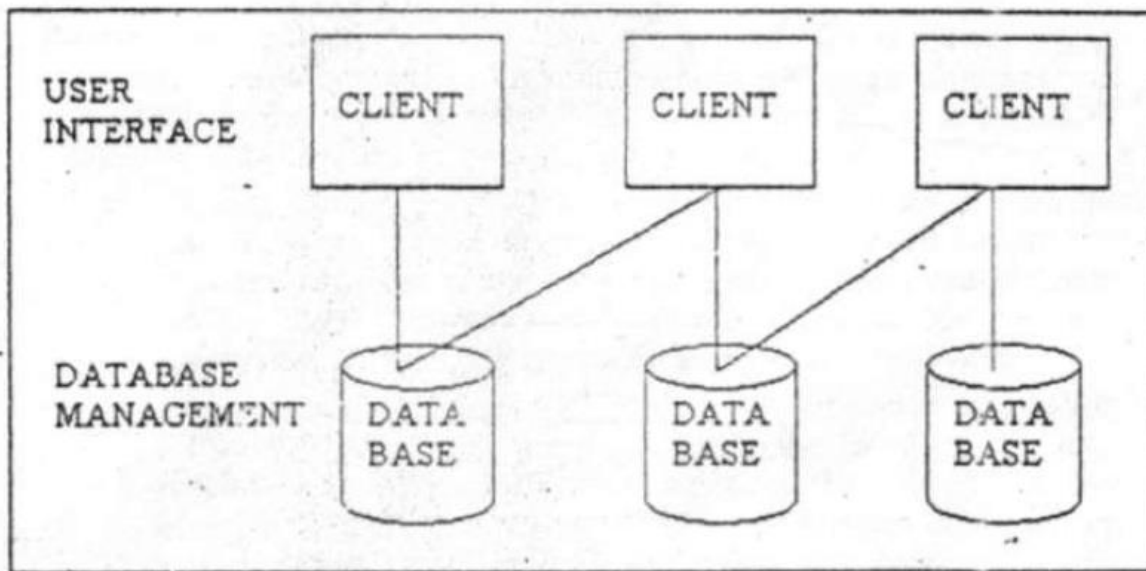
4.3.2   E-Commerce System Architecture: Three tier architecture

The three-tier architecture emerged in the 1990s to overcome the limitations of the two-tier architecture. In three-tier architecture, the user interface and the business application logic, also known as business rules and data storage and access, are developed and maintained as independent modules.
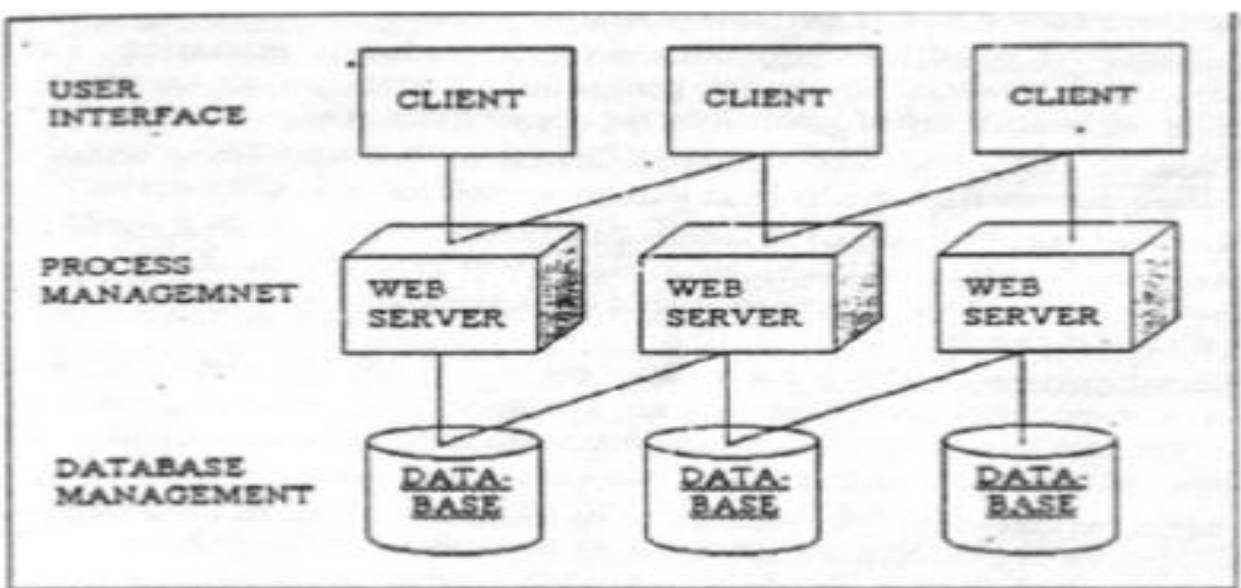
The three-tier architecture includes three tiers:

- ✓ Top tier,

- ✓ Middle tier and

- ✓ Third tier.

The **top tier** includes a user interface where user services such as session, text input, and dialog and display management reside.

The **middle tier** provides process management services such as process development, process monitoring and process resourcing that are shared by the multiple applications.

The **third tier** provides database management functionality. The data management component ensures that the data is consistent throughout the distributed environment, the centralized process logic in this architecture, which makes administration easier by localizing the system functionality, is placed on the middle tier.

The figure above shows the outline of the e commerce system three - tier architecture diagram.

4.3.3 Advantages of Client –Server model:

➢ The client-server architecture provides standardized, abstract interfaces to establish communication between multiple modules. When these modules are combined, they become an integrated business application. Each module is a shareable and reusable object that can be included in another business application.

➢ In the client-server architecture, the functions of a business application are isolated within the smaller business application objects and so application logic can be modified easily.6

➢ In "the client-server architecture, each business application object works with its own encapsulated data structures that correspond to a specific database. When business

application objects communicate, they send the data parameters as specified in the abstract interface rather than the entire database records.

➤ This reduces the network traffic. In the client-server architecture, a programmer can develop presentation components without knowing the business application logic.

➤ This architecture also helps a database analyst in accessing the data from the database without being concerned how the data is presented to an end user.

4.4 WWW

The **World Wide Web** is the universe of network-accessible information. The development of the World Wide Web was begun in 1989 by Tim Berners-Lee and his colleagues at CERN, an international scientific organization based in Geneva, Switzerland. The Web gives users access to a vast array of documents that are connected to each other by means of hypertext or hypermedia links—i.e., hyperlinks, electronic connections that link related pieces of information in order to allow a user easy access to them. Hypertext allows the user to select a word or phrase from text and thereby access other documents that contain additional information pertaining to that word or phrase; hypermedia documents feature links to images, sounds, animations, and movies. Browser software allows users to view the retrieved documents. A hypertext document with its corresponding text and hyperlinks is written in Hyper Text Markup Language (HTML) and is assigned an online address called a Uniform Resource Locator (URL).

4.4.1 Difference between World Wide Web and Internet

Some people use the terms 'internet' and 'World Wide Web' interchangeably. They think they are the same thing, but it is not so. Internet is entirely different from WWW. It is a worldwide network of devices like computers, laptops, tablets, etc. It enables users to send emails to other users and chat with them online. For example, when you send an email or chatting with someone online, you are using the internet.

4.4.2 World Wide Web and E-Commerce

This invention became the launching point of the growth of the Internet as a way for businesses to share information about them. As web browsers and Internet connections became the norm, companies rushed to grab domain names and create websites. The year 1994 saw the establishment of both eBay and Amazon.com, two true pioneers in the use of the new digital marketplace.

Companies are utilizing the WWW today for purposes of:

(1) Promoting greater awareness of their companies and products;

(2) Providing customer support for their products

(3) Offering sales of products or services directly or indirectly either exclusively through the web or to supplement existing marketing channels

(4) Selling advertising space on Web sites to other companies

(5) Offering electronic information services.

Clearly, WWW applications for electronic commerce have accelerated so quickly in the past years that little attention has been paid to understanding WWW usage at a higher level.

4.5 APPLICATIONS OF E-COMMERCE

The applications of E-commerce are used in various business areas such as retail and wholesale and manufacturing. The most common E-commerce applications are as follows:

1. Online marketing and purchasing
2. Retail and wholesale
3. Finance
4. Manufacturing
5. Online Auction
6. E-Banking
7. Online publishing
8. Online booking
9. **Electronic Newspapers**
10. **Internet Bookshops**

4.5.1. Online marketing and purchasing

Data collection about customer behavior, preferences, needs and buying patterns is possible through Web and E-commerce. This helps marketing activities such as price fixation, negotiation, product feature enhancement and relationship with the customer.

4.5.2. Retail and wholesale

E-commerce has a number of applications in retail and wholesale. E-retailing or on-line retailing is the selling of goods from Business-to-Consumer through electronic stores that are designed

using the electronic catalog and shopping cart model. Cybermall is a single Website that offers different products and services at one Internet location.

4.5.3 Finance

Financial companies are using E-commerce to a large extent. Customers can use E-commerce for following purposes-

- Check the balances of their savings and loan accounts
- Transfer money to their other account
- Pay their bill through on-line banking or E-banking.

Another application of E-commerce is on-line stock trading. Many Websites provide access to news, charts, information about company profile and analyst rating on the stocks.

4.5.4 Manufacturing

E-commerce is also used in the supply chain operations of a company. Some companies form an electronic exchange by providing together buy and sell goods, trade market information and run back office information such as inventory control. This speeds up the flow of raw material and finished goods among the members of the business community. Various issues related to the strategic and competitive issues limit the implementation of the business models. Companies may not trust their competitors and may fear that they will lose trade secrets if they participate in mass electronic exchanges.

4.5.5 Auctions

Customer-to-Customer E-commerce is direct selling of goods and services among customers. It also includes electronic auctions that involve bidding. Bidding is a special type of auction that allows prospective buyers to bid for an item. For example, airline companies give the customer an opportunity to quote the price for a seat on a specific route on the specified date and time.

4.5.6 E-Banking

Online banking or E- banking is an electronic payment system that enables customers of a financial institution to conduct financial transactions on a website operated by the institution, Online banking is also referred as internet banking, e-banking, virtual banking and by other terms. Some sites related to Internet banking are as follows:

- www.indianbank.net.in

- www.icicibank.com

You cannot use the services provided by the online banks till you are not the customer.

4.5.7 Online Publishing

Electronic publishing (also referred to as e-publishing or digital publishing) includes the digital publication of e-books, digital magazines, and the development of digital libraries and catalogs.

4.5.8 Online Booking

An Internet Booking Engine (IBE) is an application which helps the travel and tourism industry support reservation through the Internet. It helps consumers to book flights, hotels, holiday packages, insurance and other services online.

4.5.9 Electronic Newspapers

One of the hot areas on the Internet is the electronic newspaper. Electronic newspaper has advantages over both, the printed newspapers and the broadcast news on radio and televisions. In comparison to printed newspaper, the e-newspaper can give up-to-date news similar to broadcast news. Further, the browser could be set to select the news of interest of the reader and to leave out the rest. This is 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 a 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 and most of them are web versions of existing newspapers. For example:

- www.timesofindia.com
- www.dainikjagran.com

4.5.10 Internet Bookshops

It is one of the first applications of e-commerce on Internet. Books as an item have the following significant advantages:

- 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 letterbox. The customer does not need to be at home.
- 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 also if possible.
- 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 on 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.infibeam.com
- books.rediff.com

4.6 **ADVANTAGES**

4.6.1 Speed up the buying process and save time for customers

It literally speeds up the buying process because when someone thinks of buying one specific product from the physical store, which is very far and not easily available. Here how the E-commerce helps the customer to avail the specific product easily and speedily.

For example – Sometimes customer are not able to find a particular product from the store and even by visiting other chained stores, this is where E-commerce come into a scene with a quick response over the requirement by even helping to purchase the particular product without wasting time.

E-commerce helps the one to choose from a wide range of online accessed products easily and get it delivered too; it helps you to access online global market standards.

Such type of buying process can help you to reduce the traveling time and helps you with choosing plenty of options which you might be looking forward to getting your own one.

4.6.2 Personalize the store as per the customer expectation

One of the online business benefit which will enhance your <u>online shopping</u> experience. It is because every purchase which is made online will be referred as per location and recommended as per customers advanced searches.

It is one kind of personalize store where every customer has a different front page because of their location and previous purchases. Even customers are eligible sometime to get extra services because of previous history and loyalty towards the services. Such kind of store helps the customer to fulfill their expectations.

4.6.3 Reduce recurring cost while hiring virtual support resources.

One of the factors which can benefit in E-commerce is that by hiring employees is affordable. It is like you can choose to outsource your task and work to your virtual assistants in different countries. It will make your presence of the company in a different location at the same time always. In this case, you will not need many employees in an E-commerce business as compared retail locations.

4.6.4 Easily retarget your customers.

There are many ways to retarget the customer and sell the product nicely. Below are some of the techniques which you can use to retarget customers:-

- Share a coupon when customers leave the checkout page.
- Even by sending emails which are pitching upsell and cross-sell.
- Can be done through Google paid and organic search results.
- It can be done through the customer's number of visits to a specific page with a certain period of time.

4.6.5 Easier to encourage an impulse buy

Impulse buying is one of the techniques where it works as a common behavior of customer's perception towards a particular product. It is related to the control of human psychological behavior which is like some people possess personality traits that can be said as impulse buying tendencies.

This is what can be used on an <u>E-commerce platform</u> too by making the product more attractive with images, other color options and even by showing a video of the product. So the customer can get the same aura of buying the product from the store.

4.6.6 Reviews Available

It has so many positive recommendations which can give more values to your <u>E-commerce website</u> and help customers to build more trust over a particular product. It can help you to be clear and more visible about the product that helps you with more product selection too.

All of the reviews are valuable to customers, which can really help a lot to built trust over the products and services

4.6.7 Able to provide detailed information to the customer.

Every customer looks for more details over the products so that it can help them to take a wise decision over their purchases. It is one kind of description which really helps a lot and expresses about any particular product.

It is in short one kind of information which is been shared clearly on the description about the <u>product</u>, that helps the user to take a final decision on the requirements. The flow which is been shared below the product in detail makes the customer to understand it in more details and that makes them to put them on a cart for their final check out with making them aware of all the features and functions of the product.

4.6.8 Best Quality of services in reasonably low operation cost

It is one of the benefits which plays a very vital role over an E-commerce platform. In most of the case, physical retail stores have to pay a lot to maintain their presence in the market by paying rent or even if it's own. There are several upfront costs which affect the store which is physically owned.

E-commerce store will help you cut off more than 60% of the price which has been run through a physical store. When you talk about operation cost it is very high as compared to the online store. One has to pay their staff, location charges, inventory, store design etc, which affects a lot.

4.6.9 Quick and affordable marketing

You will not have to spend many bucks to market your e-commerce biz. There are many ways to pull your E-commerce business into this online world through various ways of online marketing which are quick and affordable.

Here are some of the unique ways which can just make you understand and help you with improvising marketing techniques.

- Always go with great content this is what helps you to be more visible in the market through creative content marketing.
- You can even go for creative marketing video which expresses about the product and services.
- Social networking helps you to make your presence everywhere because there is no one who is currently not into socializing.
- Even there are DIY info graphics which helps you to express about presence, you can say contrary that it works as browser.
- It helps you to enlighten the life to old data too.
- Every customer can be reached through digital market just have to focus on the techniques to approach them.

This what makes all things affordable because when you try to same on offline marketing it is expensive and time consuming a lot.

4.6.10 Provide flexibility to the customer to buy product 24/7

It has more flexibility over the regular store because the services are available 24/7 and though helps to serve you the services at anytime and anyplace.

There is a lot of change in the online markets recently which are providing you services helping you with the recommendation, sales support, chat support and even helps you find similar products. E-commerce is one of the platform which available for consumers 24/7 and globally.

4.6.11 less store setup cost and quick ROI (Return of investments)

When you talk about E-commerce it has less amount of investment as compared to the offline store, it takes a huge amount of investment to set up an offline store which affects your business a lot by lacking on the return of investments.

This happens all because all investment which is been done over maintaining the store, on the contrary, it takes less amount of investment to make an online one.

Even after investing a lot of money over stock, labor, services, maintenance, electricity bill, rent (if any) etc, these will never help you out to gain profits over your investments. **E-commerce stores** are affordable and though if you see nicely than you will find that there is not much of investment as compared to the offline store and has more benefits too.

4.6.12 No Geographical limitation, tap the global market form the day one.

It is like the customer will have access to the online store from anywhere in the world, which can globally be accessed. This is what every customer is looking forward to having as their service because sometimes customers are not able to find a particular product which not available at the store location but though online store works like a magic to provide them with multiple options. So, they can avail the services easily.

That is the main reason why E-commerce store helps you to be visible over the global market, where you will be fully available to everyone across the globe from the day one itself.

4.6.13 Reduce Resource hiring and training cost

In E-commerce you will not have to hire many employees as compared to the store, it is because when you open an online store your half of the work is been done through approaching customers directly by providing detailed information and visibility of the products.

You will not have to hire a seller to express everything about the product or have to train them. This is what makes E-commerce more effective in cost deduction of hiring and training employees.

4.6.14 Avoid human error while dealing with customers.

In the path of e-commerce, you will never face the issue of human error because every product is updated with details on the site, so that makes easy for the customer to have more visibility over the products.

This is what makes the customer feel comfortable to buy online as compared to the store. The stores are way more difficult sometimes because due to lack of options, comparison and descriptions.

When you visit a store you will always find that the seller tries to express with things which are not much convincing but though still, you will have to hear it till the end. This is what makes the

customer more confusing to buy or not? It is like getting pitched again and again for the same on what you are not looking for to get checked out.

4.6.15 Environment – Friendly

You can say the E-commerce is totally eco-friendly as compared to the store. It is because when we visit a store at a time of purchase, we receive a bill, receipts, coupons etc.

These harms our environment a lot and that is the reason why E-commerce bought such services which are much eco-friendly and easy to maintain.

4.6.16 Compare product and price

In the world of E-commerce, you can compare the products easily which shares a detailed description over it. The most beneficial part of E-commerce is that you can avail and understand the product clearly but though this happens totally opposite when you visit a store.

In store you might not be able to find the product and will not be able to compare it, even you might have to visit multiple shops to know the differences.

This is what saves time for the customers when we look into the world of E-commerce. Every service which are been provided through E-commerce are made to serve customers to have easy access with more details and less time-consuming.

4.7 DISADVANTAGES OF E-COMMERCE

4.7.1 Security

Online portals have been in the news a lot because of hacks by cybercriminals and hackers. It is a very serious issue as your account might be hacked because of negligence and wiped out clean of the existing cash.

This is a harsh reality of e-commerce sites and a website cannot give this assurance that the financial information cannot be compromised on its portal. The website owner needs to take important steps to change its password so as to stop any data breaches.

- Training and maintenance-
- Hardware and Software problems
- Online Security problem

4.7.2 Legal issues

Several cyber laws have been implemented to protect the rights of both seller and buyer. If you are looking to create a website it is important that you go through the local laws as well as cyber laws so that you do not have to face any problems later on. A serious disadvantage of e-commerce portals is that people either take care of local laws or cyber laws and fail to realize that you need to pay attention to both of them if you want to make a success of your business.

4.7.3 Huge technological cost

E-commerce requires advanced platforms to better their <u>performance</u>. If it faces disturbances in the form of software, network or domain issue it will not be able to offer seamless transactions. The apt technical infrastructure is costly and needs huge investment. It also needs to be upgraded periodically to stay with changing times. Huge technological cost for a successful venture is a disadvantage of the e-commerce portal.

4.7.4 Fear

People fear the unknown. E-commerce transactions are mostly faceless and paperless without any due proof. Most of the organizations do not have a physical existence and customers are hesitant to make card payments beforehand.

They fear that if the desired product does not arrive then they will lose their money. If this happens then how are they going to trace the online outlet and recover their hard-earned money? One of the disadvantages of e-commerce is the absence of the physical existence of the store.

4.7.5 High labour cost

High labour cost is a serious disadvantage of the e-commerce platform. You need to hire technically sound, trained and qualified workforce for your website who are talented and capable of handling them in an efficient manner.

You need to shed a large chunk of money to hire and retain a talented pool of workers that will prove an immense help in handling all transactions.

4.7.6 Credit card fraud

Online transactions are mostly made by debit card, credit card, and internet banking and in very few cases with cash on delivery option. Yes, the website owners try to take every available precaution to protect the card details but what if the site is hacked by cybercriminals.

It is a growing concern as we hear news of data hacks regularly. The websites need to place proper blockers in place because the customers will lose faith and will stop making online payments. Stop it before it starts proving a serious disadvantage for e-commerce sites.

4.7.7 Dependency on the website

An e-commerce site is heavily dependent on its website. If it is not properly projected or the software is not implemented the site can face technology hiccups. It then comes under the serious radar.

Customers tend to lose faith very easily and shift their loyalties to other portals that they find convenient. The portal will suffer substantial loss because of this action.

Do not keep all the eggs in one basket as the dependency on the website can prove a disadvantage of e-commerce in times of crises.

4.7.8 Shipping problems

E-commerce stores run successfully because it can ship its products from anywhere to everywhere with ease. It has a strong network that helps it in its endeavor. In a physical store, a buyer chooses a product, purchases it and leaves the store with the item.

This is not so on an online store where the customer has to choose and buy and then wait for the product to arrive at his doorstep within the stipulated time frame. Shipping is an integral part of commerce and if you do not have appropriate infrastructure then it can cause serious issues and become a disadvantage of e-commerce.

4.7.9 Some products are difficult to buy online

If you think that you can buy everything online then it is your misconception. There are products for instance eatables like ice cream, spectacles, and metals like gold and silver that you do not want to buy online even if you have the option of doing so.

You cannot trust yourself to make a purchase without visibly touching, trying, testing them and this can prove a disadvantage for an e-commerce site. All the images and assurances cannot tempt you to buy some items, for example, you need to buy a gold and diamond bracelet.

Do you trust the online store to meet your expectations or will you make the effort and travel to a physical store to verify and then make a purchase.

4.7.10 late delivery

Late delivery is one of the common disadvantages of e-commerce platforms. While ordering a product the customer is assured that it will reach him in maximum seven days or a particular time period. In most cases that do not happen and you are kept waiting for it.

Ultimately when the information reaches you that the product will be delivered on this day the portal is not specific about the timings. There are several instances when a person who is going to collect the parcel had to wait for hours for the delivery.

His whole day is wasted and he could not go outside as per his original schedule. Such a situation makes the customer angry as he feels unnecessarily harassed.

4.8 SUMMARY

E-commerce is the production, distribution, marketing, sales or delivery of goods and services by electronic means. E-Commerce is commonly referred as electronic commerce. It is also known as "Internet Commerce". It refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. E-Commerce creates a virtual market place for customer over internet. In traditional commerce, communication/transactions are done in synchronous way. Manual intervention is required for each communication or transaction. Now with e-commerce, communication or transactions can be done in asynchronous way. The whole process is completely automated. E-Commerce can be implemented in one of the following ways- EDI, E-mail, electronic bulletin board, electronic fund transfer.

4.9 KEYWORDS

VMP (Virtual Marketplace): A nonphysical and borderless spatial dimension that exists in the digital domain, in which exchange relations and transactions take place at different levels through digital interactions supported by communication technologies.

EDI: Electronic Data Interchange (EDI) is the electronic interchange of business information using a standardized format; a process which allows one company to send information to another company electronically rather than with paper. Business entities conducting business electronically are called trading partners.

EFT: Electronic funds transfer (EFT) are electronic transfer of money from one bank account to another, either within a single financial institution or across multiple institutions, via computer-based systems, without the direct intervention of bank staff.

E- Commerce: Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions.

E-Banking: Electronic banking is a form of banking in which funds are transferred through an exchange of electronic signals rather than through an exchange of cash, checks, or other types of paper documents.

E-Newspaper: An electronic newspaper is a self-contained, reusable, and refreshable version of a traditional newspaper that acquires and holds information electronically.

4.10   Self-assessment Tests

(a) Student Activities

1. What is E-commerce and why it is needed?
2. How to use E-commerce in our daily life?
3. Explain how application of WWW plays a vital role in implementation of   E-Commerce?
4. What kind of advantages does business gets using E-commerce?
5. Which technical and economical limitations are faced by a business using E-commerce?
6. Discuss the advantages of E-commerce.
7. Explain the various disadvantages of E-commerce.
8. Discuss the applications of E-Commerce.
9. Explain WWW and differentiate between WWW and Internet.
10. Discuss E-commerce system architecture.

(b) Learning Activities

1. _____ is the electronic interchange of business information using a standardized format.
2. _____ refers to the buying and selling of goods or services using the internet.
3. The dimension of e-commerce that enables commerce across national boundaries is called _____.
4. A _____ is the set of planned activities designed to result in a profit in a marketplace.
5. The _____ is the universe of network-accessible information.

(c) Feedback of learning activities

Answers of learning activities:

1. Electronic Data Interchange

2. E-Commerce

3. Global reach

4. Business model

5. World Wide Web

4.11 Study Tips

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Subject: E-Commerce	
Course Code: BC- 204	Author: Mr. Balwant Kumar
Lesson : Models of E-Commerce	Vetter: Prof. Dharmender Kumar,

LESSON STRUCTURE

5.0   Learning Objectives

The objective of this chapter is to get the students acquainted with the basic concepts of E-commerce business models. This chapter highlights the different types of E-commerce models. After reading this chapter, you will be able to:

✓ Describe the various types of E-commerce models

✓ Give examples of different types of E-commerce models

✓ Define pros and cons of different types of E-commerce models

5.1   Assessment of prior Knowledge

In this chapter, we dive into the types of E-commerce business models and afterward, discuss the pros and cons of running an E-commerce venture using any of them. Before we get to that, let's define **what a business model is**?

A business model refers to a plan for the successful operation of a business and how it relates to existing products or services in the industry. It also encompasses the revenue sources as well as the potential customer base. A **business model** is a set of planned activities (sometimes referred to as *business processes*) designed to result in a profit in a marketplace. A business model is not always the same as a business strategy, although in some cases they are very close insofar as the business model explicitly takes into account the competitive environment. The business model is at the centre of the business plan. A **business plan is** a document that describes a firm's business model. A business plan always takes into account the competitive environment. An **e-commerce business model** aims to use and leverage the unique qualities of the Internet, the Web, and the mobile platform.

5.2   TYPES OF E-COMMERCE BUSINESS MODELS

There are primarily six e-Commerce business models:

➢ Business-to-Business (B2B)

➢ Business-to-Consumer (B2C)

➢ Consumer-to-Business (C2B)

➢ Consumer-to-Consumer (C2C)

➢ Business-to-Government (B2G)

➢ Consumer-to-Government (C2G)

5.3   BUSINESS-TO-BUSINESS (B2B)

Business to business, known as B2B model, is the largest e-commerce model that is based on revenue which involves trillions of dollars. In this both the buyers and sellers are business entities. B2B describes commerce transactions between businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer. The volume of B2B transactions is much higher than the volume of B2C transactions and any other transaction. The primary reason for this is that in a typical supply chain there will be many B2B transactions involving sub components or raw

materials, and only one B2C transaction, specifically sale of the finished product to the end customer.
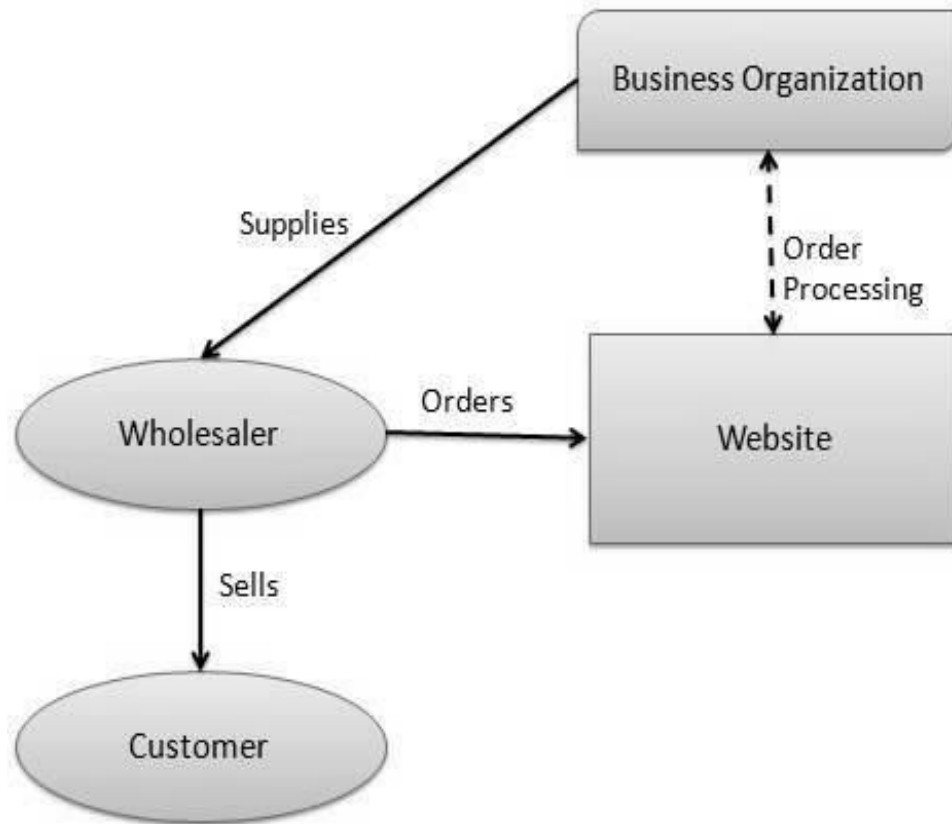
A website following the B2B business model sells its products to an intermediate buyer who then sells the product to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end product to the final customer who comes to buy the product at one of its retail outlets.

5.3.1   B2B EXAMPLES

Do you want to know the details about such companies in India? Followings are the some examples:

- AmazonBusiness.in

Amazon, the US-based ecommerce giant started its B2B online platform in 2015 to fulfill the demand of business customers who were looking for the seamless 'Amazon buying experience' while procuring supplies for their work.

Currently available in two cities, Bangalore and Mangalore with plans to expand in other cities, you can become a part of this members-only site if you have a valid business license.

Payments can be made through NEFT/RTGS transfer, Credit/Debit Card and Net-banking and cash-on-delivery service is available for Bangalore-based buyers. The marketplace also offers free credit service (up to 48 days) in association with HDFC Bank and ICICI Bank.

Its main USPs are the brand name 'Amazon' and ease of buying.

Primary Categories: Health & Personal Care, Home Medical Supplies, Beauty, Food & Beverages, Cleaning & Laundry, Mobile & Accessories, Office & IT Peripherals, Home, Kitchen & Dining products at wholesale prices and in bulk quantities.

- Power2SME.com

Founded by R. Narayanan in 2012, Power2SME calls itself the first 'Buying Club' for SMEs. The company was formed with an aim to empower SMEs by making it easy & affordable for them to procure raw materials.

In 2014, the company raised Rs. 42 crores in Series C round of funding from Accel Partners, Inventus Capital and Kalaari Capital. In January 2016, Chairman of UIDAI Nandan Nilekani along with the existing three investors poured more capital into Power2SME during Series D round of funding.

In April 2016, the B2B firm's revenue was $10 million and the average order value was Rs.25 lakh! This is why the company is confident about breaking even by next year.

Register for free or fill up the Request for Quote (RFQ) form with your business requirement. The company's sales representative then gets in touch with buyers with proposed rates. SMEs can avail loan facility on request.

Its main USPs are strong investors and high-quality suppliers like LG, Essar, and Indian Oil.

*Primary Categories***:** Abrasives, Adhesives, Safety, Power tools, Plumbing, Hand tools, Power Transmission, Security, Machining, Office Supplies, Motors & Pumps, Medical Supplies, Electricals, Hardware and a lot more.

- IndustryBuying.com

Established in 2013 by Swati Gupta and Rahul Gupta, Industry Buying is a B2B marketplace for industrial good and supplies. Regular buyers are offered credit and the purchasing process is quite straightforward.

The start-up has grown tremendously with its seller base increasing from 1000 in 2015 to 4,500 in May 2016. Buyer base increased from 40 enterprises and 25,000 SMEs in 2015 to 150 enterprises and 75,000 SMEs in May 2016. Customer visits too multiplied by four times.

The company has raised Rs 87 crores from investors such as Kalaari Capital, Saif Partners and BEENext so far.

Its main USPs are impressive growth & traction and innovative product solutions like ProcMan.

Primary Categories: Lab supplies, LED & lights, Electronics & Robotics, Cleaning, Dimension Measurement, Industrial Automation, Furniture & Hospitality, Lubricants & Oils, Powder & Coatings, and Welding are just 10 of the 40+ categories.

- Bizongo.in

This B2B marketplace focuses on bulk buying and selling of 'Packaging' materials. Started by Aniket Deb, Sachin Agrawal and Ankit Tomar (IIT Bombay and IIT Delhi graduates) in 2014, the startup found an investor in Accel Partners.

It initially started as a platform for plastic and chemical product categories, but as of now, there are only packaging products listed on the website.

Last heard news about Bizongo's funding was in October 2015, when Accel invested an undisclosed amount in the startup.

Its main USPs are knowledgeable team and ability to adapt with changing business environment.

Primary Categories: Food packaging, Bottles, rigid and protective packaging, Crates, Pallets, Drums, Dustbins, Packaging Bags & Boxes, Flexible films, Pouches and Bubblewraps.

- Tolexo.com

It's an IndiaMart subsidiary launched in June 2014 for SMEs. With more than 1,000,000+ products from over 28 categories, 7000 sellers, and 8000 brands, Tolexo's product portfolio, seller & buyer base is probably the widest and biggest out of all players. The B2B marketplace offers last mile deliveries with guaranteed dispatch within 24 hours, which is a great service for business clients.

IndiaMart had invested Rs. 100 crores in Tolexo in FY15-16.

Its main USP is its association with IndiaMart, which is one of the biggest players in the Indian B2B industry.

*Primary Categories***:** Safety, Plumbing, Adhesives, Fasteners, Electricals, Abrasives, Car & Bike Accessories, Lubrication, Handtools, Hardware, Office Supplies, Lab supplies, and much more.

- JustByLive.com

The newest one on the block, just by Live is already creating waves by multiplying its network and raising funds in less than a year. The start-up is an app-based e-distributor that connects traditional manufacturers to retailers. Thus, by eliminating regular distributors, manufacturers get better margins and retailers get a wide range of products at one glance.

The firm raised around Rs 136 crore ($20 million) in Series A funding from Alpha Capital in January 2016. Just by Live aims to restructure the age-old retail distribution system by modernizing it to fit the current fast-pace ecommerce industry.

Buyers/retailers can access the listed products through Just Buy Live's app, talk to brand teams and get order delivered at doorstep after downloading the app and registering their business. Buyers can also make use of credit facility 'Udhaar by Just Pay' by uploading required documents. If you are a brand owner, then write to brands@justbuylive.com to list your label on the B2B platform.

Its main USPs are unique concept and focussed approach backed by thorough research and experienced team.

Primary Categories: Grocery, Ayurveda, Dairy, Water, Chocolates & Sweets, Home care, Personal care, Fashion & Beauty, Auto, Appliances and many more.

The B2B ecommerce space comes with its own set of complex challenges that has forced start-ups like Omnikart to shut shop.

But such start-ups with the help of technology, new-age thinking, compassion and ecommerce have empowered SMEs to a great extent. Many business buyers have stopped haggling with local distributors and now prefer to buy from B2B ecommerce portals like the ones mentioned above.

Faster delivery, wide range of products, competitive prices, organised buying process, professional service, secure payment process, legal credit facility, low commission rates and buying assistance are few of the many reasons why industry buyers rely on such companies.

Investors too are keen on investing/buying stake in B2B start-ups as the business model doesn't allow or demand to spend funds on mindless-discounting, year-round deals, marketing & promotional activities and heavy returns like it is the case in B2C ecommerce space.

Sellers, have you tried any of these B2B marketplaces? Do you buy or sell from any such platform? Any feedback or recommendations you would like to share? Please do leave your valuable comments and help the seller community.

5.3.2   PROS

➤ The B2B market is predictable as well as stable.

➤ There is greater customer loyalty than in other models of e-Commerce

➤ B2B features lower operating costs after the initial setup since most processes are automated and valid for a long time.

➤ You can generate a sustainable and reasonably high-profit margin from repeat clients.

5.3.3   CONS

➤ B2B e-Commerce often requires substantial capital to set up. Costs include business registration, branding and setting up a physical or virtual office.

➤ There is a smaller pool of customers when compared to other models.

➤ Since B2B marketing targets businesses, sales are a little hard to come by because firms take a longer time to make decisions. Where firms ask for huge discounts because of their bulk purchase, it could eat into the profit of the seller.

## 5.4   BUSINESS-TO-CONSUMER (B2C)

Business-to-consumer (B2C) is among the most popular and widely known of sales models. The idea of B2C was first utilized by Michael Aldrich in 1979, who used television as the primary medium to reach out to consumers.

B2C traditionally referred to mall shopping, eating out at restaurants, pay-per-view movies, and infomercials. However, the rise of the Internet created a whole new B2C business channel in the form of e-commerce or selling of goods and services over the Internet.

B2C, the acronym for "business-to-consumer", is a business model based on transactions between a company, that sells products or services, and individual customers who are the end-users of these products. B2C ecommerce definition suggests the commerce transaction through a company website featured with online catalogue.

Most Internet users are familiar with the B2C ecommerce model. Consumers appreciate the convenience of online shopping where they now can purchase clothes, electronics, media subscriptions and services via Internet.

Any business that relies on B2C sales must maintain good relations with their customers to ensure they return. Unlike business-to-business (B2B), whose marketing campaigns are geared to demonstrate the value of a product or service, companies that rely on B2C must elicit an emotional response to their marketing in their customers.
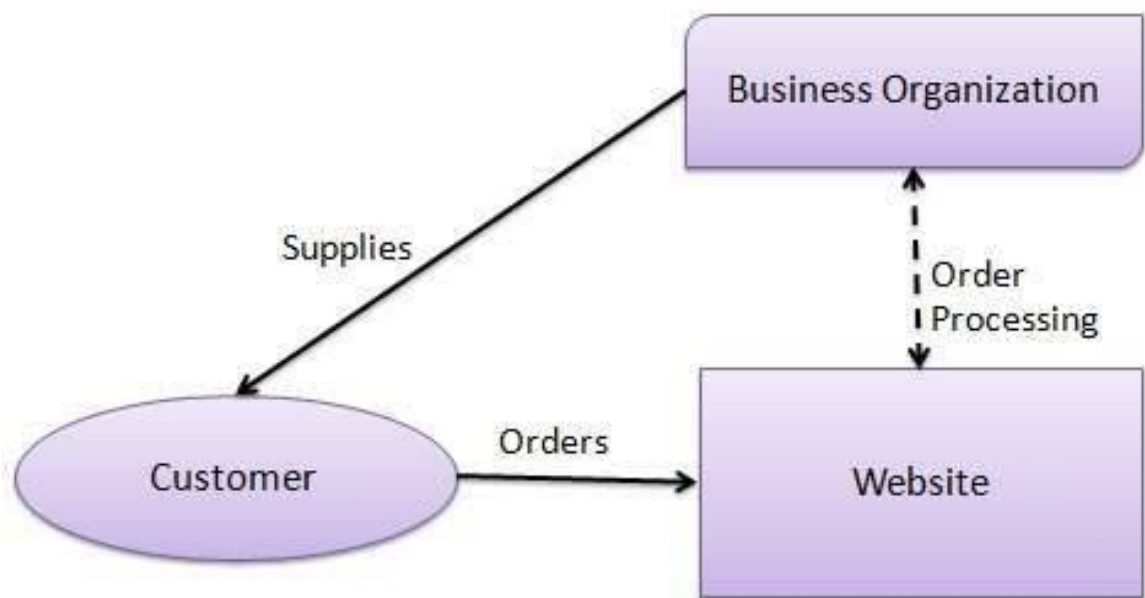
Following are the key features of the B2C model

 ➢ Heavy advertising required to attract customers.
 ➢ High investments in terms of hardware/software.
 ➢ Support or good customer care service.

Consumer Shopping Procedure

Following are the steps used in B2C e-commerce:

A consumer −

 ➢ Determines the requirement.
 ➢ Searches available items on the website meeting the requirement.
 ➢ Compares similar items for price, delivery date or any other terms.

- ➢ Places the order.
- ➢ Pays the bill.
- ➢ Receives the delivered item and review/inspect them.
- ➢ Consults the vendor to get after service support or returns the product if not satisfied with the delivered product.

5.4.1 B2C Business Models in the Digital World

There are typically five types of online B2C business models that most companies use online to target consumers.

1. Direct sellers. This is the most common model, in which people buy goods from online retailers. These may include manufacturers or small businesses, or simply online versions of department stores that sell products from different manufacturers.

2. Online intermediaries. These are liaisons or go-betweens who don't actually own products or services that put buyers and sellers together. Sites like Expedia, Trivago, and Etsy fall into this category.

3. Advertising-based B2C. This model uses free content to get visitors to a website. Those visitors, in turn, come across digital or online ads. Basically, large volumes of web traffic are used to sell advertising, which sells goods and services. Media sites like the Huffington Post, a high-traffic site that mixes in advertising with its native content is one example.

4. Community-based. Sites like Facebook, which builds online communities based on shared interests, help marketers and advertisers promote their products directly to consumers. Websites will target ads based on users' demographics and geographical location.

5. Fee-based. Direct-to-consumer sites like Netflix charge a fee so consumers can access their content. The site may also offer free, but limited, content while charging for most of it. The New York Times and other large newspapers often use a fee-based B2C business model.

5.4.2 B2C Examples

- ➢ All major online retail stores like Amazon and payment processors like PayPal.
- ➢ A traveling agency that provides ticket and travel insurance policies to clients.
- ➢ A digital education website such as Code Academy that lets users learn basic computer programming for free.

5.4.3 PROS

➢ It requires a reasonably low start-up capital when compared to other e-Commerce models. For instance, drop shipping allows selling products without you having to manage an inventory or delivery.

➢ Anyone with a basic knowledge of the internet can set up and manage a B2C e-Commerce store under little supervision.

➢ It is also easy to scale a B2C e-Commerce venture.

➢ It involves selling to a wide range of audience with already known purchase patterns and behavior.

➢ It allows for flexibility since the platform is the channel for efficiently collating market demand in real-time.

➢ It is easier to encourage B2C e-Commerce shoppers to practice impulse buying since you can run ads targeted towards customers that are not even searching for what to buy.

➢ The retailer is in charge of discounts and giveaways as opposed to the B2B model.

5.4.4 CONS

➢ The B2C space is highly competitive with most firms already boasting a majority of the market share.

➢ Shipping products across borders can be a massive challenge if you mistakenly land the wrong shipping company.

➢ Many buyers still prefer making purchases in-store rather than online.

➢ There is little difficulty in sourcing for hot and cheap products to list on your e-Commerce store throughout the year.

➢ The market is continually evolving and requires upgrades more frequently than in other models.

5.4.5 DIFFERENCE BETWEEN B2B AND B2C

The point given below clarifies the difference between B2B and B2C:

1. B2B is a business model where business is done between companies. B2C is another business model, where a company sells goods directly to the final consumer.

2. In B2B, the customer is business entities while in B2C, the customer is a consumer.

3. B2B focus on the relationship with the business entities, but B2C's primary focus is on the product.

4. In B2B, the buying and selling cycle is very lengthy as compared to B2C.

5. In B2B the business relationships last for long periods but in B2C, the relationship between buyer and seller lasts for a short duration.

6. In B2B, the decision making is fully planned and logical whereas in B2C the decision making is emotional.

7. The volume of merchandise sold in B2B is large. Conversely, in B2C small quantities of merchandise are sold.

8. Brand value is created on the basis of trust and personal relationship of business entities. In contrast to, B2C where advertising and promotion create brand value.

BASIS FOR COMPARISON	B2B	B2C
Meaning	The selling of goods and services between two business entities is known as Business to Business or B2B.	The transaction in which business sells the goods and services to the consumer is called Business to Consumer or B2C.
Customer	Company	End user
Focus on	Relationship	Product
Quantity of merchandise	Large	Small
Relationship	Supplier - Manufacturer Manufacturer - Wholesaler Wholesaler - Retailer	Retailer - Consumer
Relationship horizon	Long term	Short term
Buying and Selling cycle	Lengthy	Short
Buying Decision	Planned and Logical, based on needs.	Emotional, based on want and desire.
Creation of Brand Value	Trust and Mutual Relationship	Advertising and Promotion

5.5 CONSUMER-TO-BUSINESS (C2B)

C2B is a business model in which consumers (individuals) offer products and services to companies and the companies pay them. This business model is a complete reversal of traditional business model where companies offer goods and services to consumers.

This kind of economic relationship is qualified as an inverted business model. The advent of the C2B scheme is due to major changes:

➢ Connecting a large group of people to a bidirectional network has made this sort of commercial relationship possible. The large traditional media outlets are one direction relationship whereas the internet is bidirectional one.

➢ Decreased cost of technology : Individuals now have access to technologies that were once only available to large companies (digital printing and acquisition technology, high performance computer, powerful software)

Consumer-to-Business model is based on 3 players: a consumer acting as seller, a business acting as buyer and an intermediary dealing with the connection between sellers and buyers.

Consumer

A consumer in the C2B business model can be any individual who has something to offer either a service or a good. The individual is paid for the work provided to the companies. Depending on the model, the "consumer" can be:

➢ A webmaster/ blogger offering advertising service (through Google Adsense program for example or amazon.com affiliation program)

➢ A photographer or a designer offering stock images to companies by selling his artwork through Fotolia or istockphoto for example

➢ Any individual answering a poll through a survey site

➢ Any individual with connections offering job hiring service by referring someone through referral hiring sites like jobster.com or h3.com

Business

Business in the C2B business model represents any companies buying goods or services to individual through intermediaries. Here are some examples of potential companies which can be such clients:

➢ Any company which wants to fill a job (through referral hiring sites)

➢ Any company needing to advertise online (through Google Adwords program for example)

➢ Any advertising agency which needs to buy a stock photo (through microstock sites)

Intermediary

The Intermediary is the crucial element since it creates the connection between business which needs a service or a good and a mass of individuals. Intermediary is usually a portal both for buyers (businesses) and seller (individuals).

The intermediary plays two roles:

➢ It promotes goods and services offered by individuals by proposing a distribution channel. It offers what individuals can't do themselves : large promotion, logistic and financial support, technical expertise

➢ It offers buyers a contact to a mass of individuals and takes care of money transactions and legal aspects

We can notice that some intermediaries prefer creating two different accesses one for buyers and one for sellers (Google Adwords for advertiser - Google Adsense for web publisher) whereas other companies like Fotolia have only one access because buyers and sellers can be the same.

We can differentiate two kinds of intermediaries:

➢ Extern intermediary : they act as a extern agent within the relation between companies and individual (ex : referral hiring site)

➢ Intern intermediary: they play the role both of business and intermediary. For example, it is the case of amazon.com through its affiliation program. Amazon pays individual to promote its own products.

PROS

➢ C2B provides a channel for companies to source and hire a variety of service talents and products from around the globe.

➢ It also provides an opportunity for companies to prioritize hiring from regions where the standard of living is low, thus, reducing what figure goes on the pay check.

➢ It also allows service providers to gain work experience across multiple projects and get paid well for doing so.

➢ Freelancers also enjoy relative freedom and flexibility in terms of working hours.

CONS

➢ A high level of communication skills is required to convey project ideas.

➤ Companies that hire freelancers could face a challenge in sending payment to freelancers in some parts of the world.

The possibility of outsourcing means the freelancer paid for the job may not even be the one doing it. This situation could put the

➤ Employer at a disadvantage as he gets a substandard service than what he originally paid.

5.6 CONSUMER-TO-CONSUMER (C2C)

A website following the C2C business model helps consumers to sell their assets like residential property, cars, motorcycles, etc., or rent a room by publishing their information on the website. Website may or may not charge the consumer for its services. Another consumer may opt to buy the product of the first customer by viewing the post/advertisement on the website.
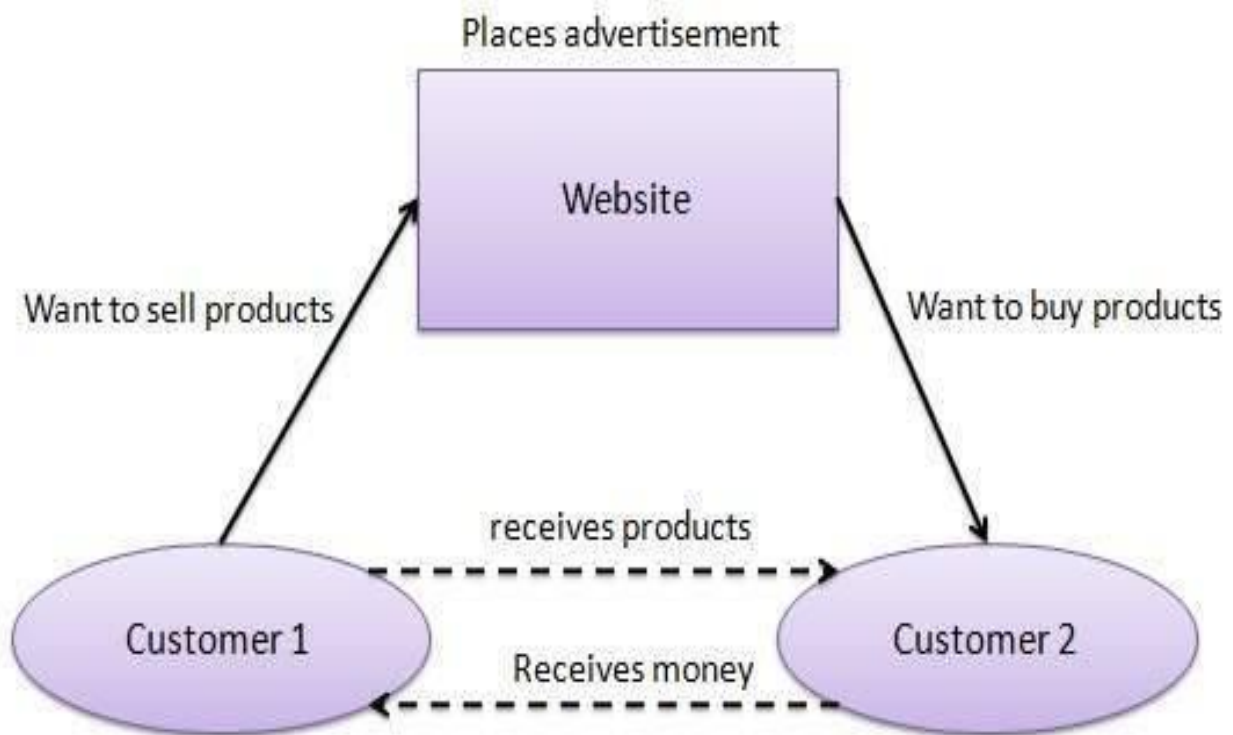
C2C Examples

➤ The foremost example of C2C via a third-party website would be an auction platform like eBay which brings seller and buyers together. eBay charges a fee for facilitating each sale

while the other parties to the transaction are responsible for settling other matters such as product quality, packaging, shipping, and refunds.

➤ Cryptocurrency exchanges that offer over-the-counter trades to users. Under such circumstance, the exchange charges a fee for the transaction while it allows the users to transact cryptocurrencies with one another.

➤ It is important to note that most businesses operate the B2C and C2C models simultaneously even though they may decide to start up with one. In most cases, though, the B2C comes first while the C2C follows shortly as an extension and additional revenue source.

➤ If you plan to go down this path, you may need to do more extensive research to find out what buyer behavior is prevalent in the market before deciding which model to employ first.

PROS

➤ There are usually no upfront costs to get product listed on a third-party C2C website.

➤ With C2C, the products gallery is unlimited since different customers are on board and selling various items scattered across different niches.

➤ C2C facilitates the sale of used items as opposed to B2C where a majority of the products are new.

➤ C2C often serves as a black market for businesses to purchase items without going through the primary market.

➤ Any online platform that allows interaction between two or more people can facilitate a C2C trade.

CONS

➤ The cost charged for each sale using the C2C ecommerce model on a third-party site like eBay may eat into the profit of the merchant.

➤ C2C poses a high level of risk in terms of product quality than other ecommerce business models. Under C2C, most transactions require that both parties trust it each other.

➤ For auction sites, users may end up buying goods at inflated prices which is not a good economic decision.

5.7   BUSINESS-TO-GOVERNMENT (B2G)

It is the exchange of information, services and products between business organisations and government agencies on-line. It refers to the use of the Internet for public procurement, licensing procedures, and other government-related operations. In most case, businesses under this umbrella have these government or public administrative offices as their only clients and receive contracts on a long-term basis. Such a situation makes it possible for them to easily calculate profits and manage funds effectively while delivering their solution to a wide audience. Sadly, though, their business could also be negatively affected if there is a change in government and the new authority refuses to honor the already existing contract.

Consider this scenario:

An online marketing agency or influencer is contracted by a sitting government to manage its political campaign by broadcasting promotional material to the masses across social media and other digital channels.

If by any chance, the ruling government fails to win at the election, the new authority may likely opt for another online marketing agency or influencer to do the job of previously held by a different entity. In this situation, one B2G firm gains while the other loses out.

Other Examples of B2G

 ➢ A government using virtual workspace software designed by a creative agency.
 ➢ The situation in Ohio where the State's tax department hired the service of a third-party to collect and convert tax payments in crypto currencies to fiat.

PROS

 ➢ It features a high-profit margin and longevity than most other ecommerce business models.
 ➢ B2G businesses can enjoy tax benefits not common to other ecommerce merchants.
 ➢ It increases flexibility and efficiency in public administration.

CONS

 ➢ A change in government could adversely affect a B2G product or service provider
 ➢ It often requires huge capital to set up.
 ➢ It could also confine a business to operate within a specific geographical location, thus removing the primary purpose of ecommerce transactions which is borderless product and service delivery.

5.8   CONSUMER-TO-GOVERNMENT (C2G)

C2G is just the opposite of the last ecommerce business model albeit a little difference; this time it is the consumers or members of the public that offer value to the government or public administrative agencies.

However, it is still the public administration or government that initiates the transactions, often as a way to ease its operations and relieve the citizenry of some burdens.

The public does not bear any responsibility whatsoever if the platform conducting the C2G transactions goes offline or fails to deliver.

Examples of C2G

➢ A State's tax agency deciding to ditch paper tax filing and instead introduce an electronic tax filing portal.

➢ A State creating an information sharing platform to allow citizens to get the latest information possibly because of a suspected natural disaster.

➢ An electronic voting app for citizens to participate in an election without having to visit the polling unit or filing paperwork.

➢ Other forms of transactions between citizens and the government either facilitated by the government directly or via a third-party

Note that the government could decide to terminate C2G transactions if it doesn't realize its purpose of creating such a platform or wants to try a new approach.

PROS

➢ It makes public administration more flexible and efficient.

➢ It encourages public knowledge of internet-based technology.

➢ There is enormous profit potential for third parties contracted to handle C2G transactions.

CONS

➢ A lack of internet service in some regions could restrict the performance of C2G ecommerce.

➢ Public awareness and education programmes may be needed to introduce the populace to such systems.

5.9   Summary

A business model refers to a plan for the successful operation of a business and how it relates to existing products or services in the industry. It also encompasses the revenue sources as well as

the potential customer base. The business model is at the center of the business plan. A **business plan is** a document that describes a firm's business model. A business plan always takes into account the competitive environment. An **e-commerce business model** aims to use and leverage the unique qualities of the Internet, the Web, and the mobile platform. We discussed six types of business models in this chapter. Each model has its own pros and cons.

5.10   KEYWORDS

B2B: Business to business refers to business that is conducted between companies, rather than between a company and individual consumers

B2C: The term business-to-consumer (B2C) refers to the process of selling products and services directly between consumers who are the end-users of its products or services.

C2B: Consumer-to-business (C2B) is a business model where an end user or consumer makes a product or service that an organization uses to complete a business process or gain competitive advantage.

C2C: Consumer to consumer, or C2C, is the business model that facilitates commerce between private individuals. Whether it's for goods or services, this category of e-commerce connects people to do business with one another.

B2G: Business-to-government (B2G) is a business model that refers to businesses selling products, services or information to governments or government agencies.

5.11   Self-assessment Tests

(a) Student Activities

1. What are the different E-commerce business models?
2. Explain the B2C business model briefly?
3. Explain the B2B business model briefly?
4. Explain the C2B business model briefly?
5. Explain the C2C business model briefly?
6. Explain the B2G business model briefly?
7. Explain the C2G business model briefly?
8. Discuss the various advantages and disadvantages of different E-commerce models.
9. Differentiate between B2B and B2C model.

10. Differentiate between C2B and C2C model.

(b) Learning Activities

1. _____ type of e-commerce focuses on consumers dealing with each other.

2. _____ refers to business that is conducted between companies.

3. All major online retail stores like Amazon belongs to _____ model.

4. A _____ is a document that describes a firm's business model.

5. _____ is a business model that refers to businesses selling products, services or information to governments or government agencies.

(c) Feedback of learning activities

Answers of learning activities:

1. C2C

2. Business to business

3. B2C

4. Business plan

5. Business-to-government

5.12 Study Tips

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Subject: E-Commerce	
Course Code: BC- 204	Author: Mr. Balwant Kumar
Lesson : Electronic Data Interchange: Benefits, Components and Security Issues in E-Commerce	Vetter: Prof. Dharmender Kumar,

LESSON STRUCTURE

6.0 Learning Objectives

In this chapter you will learn about

➢ EDI Basics

➢ The definition of EDI.

➢ Comparative study of traditional document exchange and EDI.

➢ What elements are necessary to implement an EDI in a system?

➢ How many types of documents exchanged via EDI.

➢ How the EDI process works for sending and receiving documents.

➢ What are the benefits provided by EDI?

➢ In which application area EDI is used as an efficient tool.

➢ What kind of security issues are faced when you use EDI in an organization.

6.1 Assessment of prior Knowledge

This chapter introduces EDI acronym for **Electronic Data Interchange**. EDI is an electronic way of transferring business documents in an organization internally, between its various departments or externally with suppliers, customers, or any subsidiaries.

Electronic data interchange (EDI) is the use of computer and telecommunication technology to move data between or within organizations in a structured, computer retrievable data format that permits information to be transferred from a computer program in one location to a computer program in another location, without manual intervention. An example is the transmission of an electronic invoice from a supplier's invoicing software to a customer's accounts receivable software. Other electronic commerce transactions are also paperless but involve manual intervention. Examples are **Internet** transactions requiring one party to enter data manually. **Electronic mail** is another example of paperless but manual electronic commerce.

In EDI, paper documents are replaced with electronic documents such as word documents, spreadsheets, etc. Business entities conducting business electronically are called **trading partners**.

EDI has two important subsets:

✓ **Electronic Funds Transfer** (EFT) is EDI between financial institutions. The result of an EFT transaction is the transfer of monetary value from one account to another.

✓ **Financial EDI** (FEDI) is EDI between banks and their customers or between banks when there is not a value transfer. For example, a firm may receive electronic reports from its bank listing all checks received the previous day. A bank may also send its monthly statement to a firm using FEDI.

The entire process is nothing more than the transfer of information from the seller's computer to the customer's computer. EDI makes it possible to minimize or even eliminate the manual steps involved in this transfer.

6.1.1 Traditional document exchange v/s Electronic data exchange

The process improvements that EDI offers are significant and can be dramatic. For example, consider the difference between the traditional paper purchase order and its electronic counterpart:

Traditional document exchange of purchase order	EDI document exchange of purchase order
This process normally takes three to five days.	This process normally takes less than an hour.
Here buyer makes a buying decision, creates the purchase order and prints it.	Here buyer makes a buying decision, creates the purchase order but does not print it.
Buyer mails the purchase order to the supplier.	EDI software creates an electronic version of the purchase order and transmits it automatically to the supplier.
Supplier receives the purchase order and enters it into the order entry system.	Supplier's order entry system receives the purchase order and updates the system immediately on receipt.
Buyer calls supplier to determine if purchase order has been received, or supplier mails buyer an acknowledgment of the order.	Supplier's order entry system creates an acknowledgment an transmits it back to confirm receipt.

Manual order process

Order process with EDI
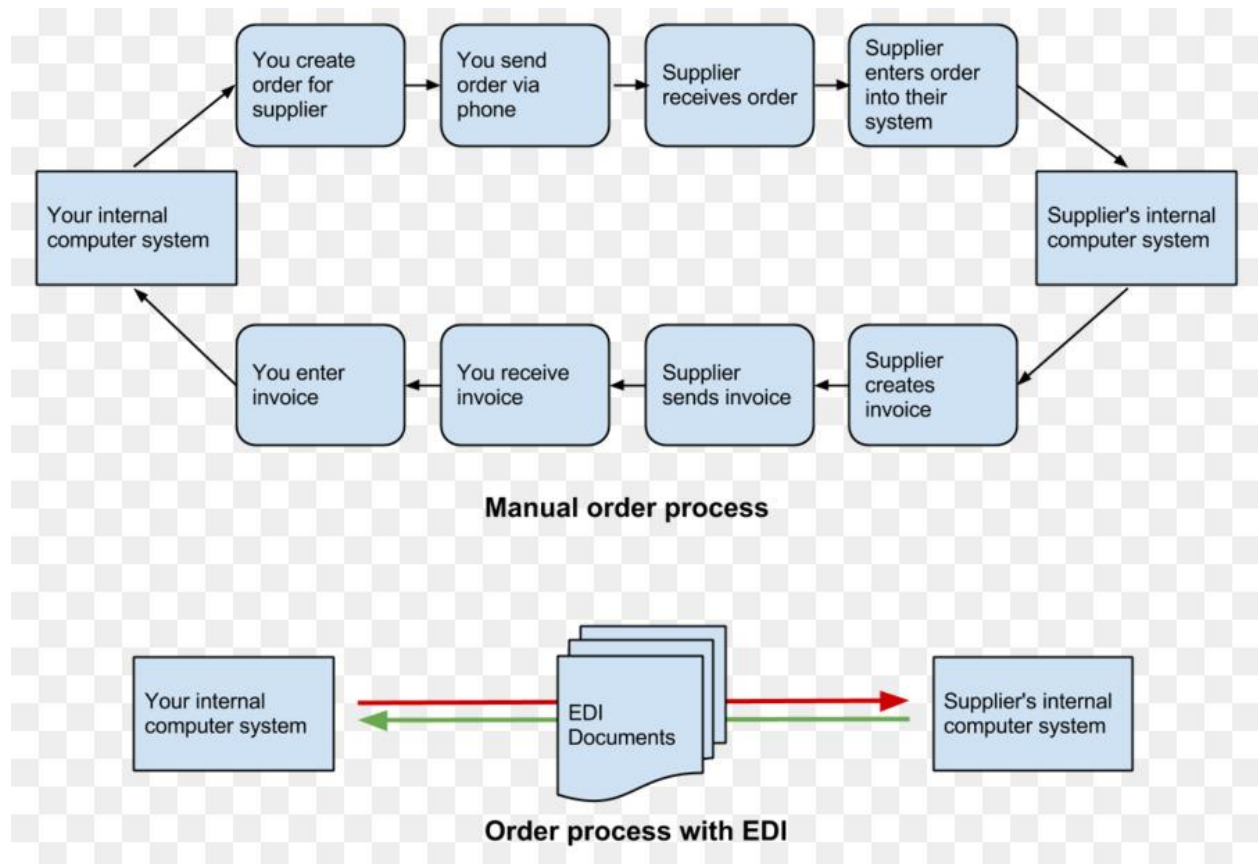
6.2 COMPONENTS OF EDI

To perform electronic data interchange, four elements must exist:

6.2.1 Format Standards

They are required to facilitate automated processing by all users. To permit the efficient use of computers, information must be highly organized into a consistent data format. A format defines how information in a message is organized: what data goes where, what data is mandatory, what is optional, how many characters are permitted for each data field, how data fields are ordered, and what codes or abbreviations are permitted.

To facilitate the widespread use of EDI, standard formats were developed so that an electronic message sent by one party could be understood by any receiver that subscribes to that format standard.

There are many different formats in use, such as EDIFACT, ANSI, X12, TRADACOMS, XML, JSON, IMP, CSV, ODETTE, VDA, VICS, HIPAA, EANCOM, ebXML, UBL ja RosettaNet.

6.2.2 Translation Software

Translation software makes EDI work by translating data from the sending firm's internal format into a generic EDI format. Translation software also receives a sender's EDI message and translates it from the generic standard into the receiver's internal format. There are currently translation software packages for almost all types of computers and operating systems.
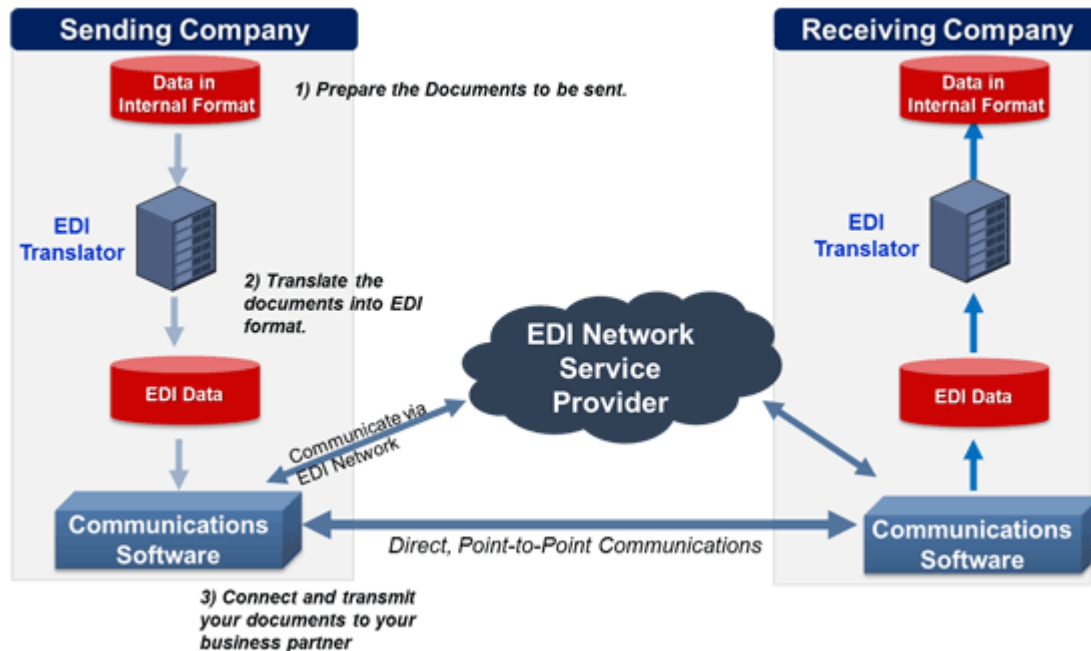
6.2.3 Communication Networks

They are very helpful in solving the technical problems of sending information between computers. When firms first began using EDI, most communications of EDI documents were directly between trading partners. Unfortunately, direct computer to-computer communications requires that both firms

✓ use similar communication protocols

✓ have the same transmission speed

✓ have phone lines available at the same time, and

✓ Have compatible computer hardware. If these conditions are not met, then communication becomes difficult.

• **Modem**- It is a hardware device which transmits data from one computer to another.

- **VAN**- A value-added network (VAN) can solve these problems by providing an electronic mailbox service. By using a VAN, an EDI sender need only learn to send and receive messages to/from one party: the VAN. VANs also provide a secure interface between trading partners. Since trading partners send EDI messages only through the VAN, there is no fear that a trading partner may dip into sensitive information stored on the computer system

- **Point- to- Point link**- Direct communication link between computers.

 6.2.4 Microcomputers- are required to bring all potential users into the market.

6.3   EDI DOCUMENTS

The real power of EDI is that it standardizes the information communicated in business documents, which makes possible a "paperless" exchange. Many business documents can be exchanged using EDI, but the two most common are purchase orders and invoices. Following are the few important documents used in EDI:

- Invoice
- Purchase Order
- Purchase Order Acknowledgement
- Advance Shipping Notice
- Payment Order/Remittance Advice
- Shipping Schedule
- Order Status Inquiry
- Order Status Report
- Warehouse Shipping Order
- Load Tender Response

➢ **INVOICE**

An invoice notifies a customer that their order is complete and that you are ready to bill them. An EDI invoice can include information about products and services rendered, the payment terms, and shipping information. Companies often send this EDI document at the same time as shipping the customer's products.

➢ **PURCHASE ORDER**

A customer sends a purchase order to their supplier to place an order. The EDI purchase order lists the items they want to order, the total quantity of each item, the agreed pricing, and shipping

information. Since purchase orders are often subject to change, it's much more convenient to use this EDI transaction than sending paper purchase orders back and forth.

➢ **PURCHASE ORDER ACKNOWLEDGEMENT**

When a supplier receives a purchase order, they will send a purchase order acknowledgment back to the customer to accept or reject the order. When accepting the order, the purchase order acknowledgment will summarize the order in full and confirm that processing of the order is starting. When rejecting the order, the supplier can indicate what information about the order needs to be changed, such as shipping dates or product that is out of stock.

➢ **ADVANCE SHIPPING NOTICE**

An advance shipping notice informs your customer that their order is shipping to them. This EDI document contains the specific details of their order, such as a list of the items shipped with descriptions and quantities, packaging information, the estimated delivery date, carrier information, and tracking numbers.

➢ **PAYMENT ORDER/REMITTANCE ADVICE**

A payment order/remittance advice EDI document accompanies an invoice payment. This EDI transaction includes the invoice number, total paid amounts, and banking information when necessary. In most cases, sending a payment order/remittance advice transaction effectively closes out the order lifecycle.

➢ **SHIPPING SCHEDULE**

A shipping schedule transaction set outlines the specific requirements for a particular shipment from a supplier. This information includes the target shipping schedule, order details, shipping carrier information, and other details regarding the shipment of an order. This EDI document is crucial for just-in-time manufacturing, which relies on real-time data to accurately manage inventory levels.

➢ **ORDER STATUS INQUIRY**

Customers will send an order status inquiry to get updated information about a purchase order or select portions of a purchase order. An order status inquiry might request an update about the shipping of an order, the status of a product in manufacturing, the quantity of a set of items that are already shipping, or other related details.

➢ ORDER STATUS REPORT

An order status report is the responding EDI transaction to an order status inquiry, providing the information requested. This EDI document can also confirm the completion of an order or the completion of a portion of the order and might include updated shipping information as well.

➢ AREHOUSE SHIPPING ORDER

A warehouse shipping order provides instructions to a remote warehouse for the shipment of an order, including which items to ship, item quantities, the target delivery date, shipping information, billing information, and the shipping method. In most cases, the seller uses a warehouse shipping order to instruct the warehouse to ship an order to the buyer.

➢ LOAD TENDER RESPONSE

Motor carriers send a load tender response to confirm or decline the pickup of a shipment outlined in a previously received offer. In addition to accepting or declining the load tender, this EDI document can accept the load tender with specific conditions, or accept and deny a spot bid request. In addition to the EDI documents listed above, there are hundreds of other EDI transaction sets exchanged electronically between businesses in a matter of minutes. Without EDI, supply chains wouldn't be able to meet the fast pace of modern business and consumer demand.

6.4 MEMBER'S INVOLVED IN EDI IMPLEMENTATION

Functional business managers- they are responsible to perform EDI feasibility studies in their own departments purchasing, sales, accounting, inventory etc.

System and communication managers- They assist technical system specification and choice of VAN and EDI software.

Auditing and legal representations- They acts as monitors. All the situations arise during implementation should be reported and resolved.

Business managers- They perform input-output testing, information exchange, transaction set.

6.5 EDI IMPLEMENTATION STEPS

The following is a quick reference check of the steps you should follow when implementing an EDI system.

1. **Identify the type of document transmission you wish to use.**

In this primary investigation step, you need to decide if you wish to use EDI transmission for your documents. If you decide to use EDI, you need to choose between the following EDI options:

- Receive EDI documents from your trading partners, and then enter them into your system manually. In this case, you do not need transmit documents.

- Receive and transmit documents using EDI. This is considered a complete electronic information flow. Both your inbound and outbound documents are transmitting via EDI.

2. Identify the type of EDI transactions you wish to perform.

Once you choose to use EDI, you must decide which documents to transmit. MAC-PAC can transmit and receive seven different EDI documents. See the EDI within MAC-PAC portion of this key concept for details on each.

3. Identify trading partners.

Choose your customers, vendors, and warehouses carefully, because they will have a significant impact on the successful use of EDI in your business.

4. Negotiate requirements with trading partners.

You must develop EDI requirements with each of your trading partners. Decide which documents you intend to transmit/receive, the format of these documents, and what EDI standards will be used. Identify the segments, elements, and qualifiers for every EDI document. Don't forget to set up proper legal guidelines for the documents as well.

5. Select a value added network (VAN).

Be sure to consider the following:

- Cost (include installation, training, and maintenance costs)
- Technical support (consider on-site as well as hot line support)
- Features (be sure it is easy to use and maintain)
- Interfacing (should interface with the translation software that you and your trading partners use)
- Install base (identify successful installations within your industry and among your trading partners)

6. Select your translation software.

Remember this software is used for both transmitting as well as receiving EDI documents. Be sure your choice works well in both modes. When selecting a translation software package, examine the following:

- Platform
- Cost (include installation, training, and maintenance costs)
- Technical support (consider on-site as well as hot line support)
- Features (be sure it is easy to use and maintain)
- Install base (identify successful installations within your industry and among your trading partners)

7. Conduct training.

Select a training program that fits your individual company's needs. You will probably need training for both your value added network (VAN) and your translation software. You may wish to obtain an EDI expert to monitor your system if your EDI transactions will have a high level of impact on your business.

8. Set up your telecommunications network.

Your telecommunications network will include modems, communications lines, and transmission software. Depending on the impact level to your business, you may wish to choose low speed transmission equipment to decrease costs. If your business requires high communication integrity, you may choose leased lines rather than standard communications lines. Your EDI expert can help you select your telecommunications equipment.

9. Configure your translation software and telecommunications network.

You must define your documents and the mapping of your data. The data map consists of field maps as well as conversion tables. This map is the guide to converting your data into the EDI standard files. You must also configure your communications network. Be sure your trading partners have also configured their translation software correctly. Remember, successful transmission of your EDI transactions depends on both parties.

10. Host system design and configuration.

If you intend to use a host system to store your data once it has been translated to the EDI standard files, you will need to design and configure that system. Be sure to integrate the necessary file

mapping for the translation software and the interface between your existing system and the host system. Also, make architectural modifications if necessary.

11. Test the entire system.

Test every aspect of your EDI system including:

Your MAC-PAC setup: Remember you may be transmitting in both asynchronous and batch modes. Be sure to test both.

The translation software: This includes your host system if you are implementing one. Be sure every EDI document has the correct data map and is correctly translated in the EDI standard files. Test both transmitting and receiving EDI documents.

The value added network (VAN): This network needs to be able to transmit all of your inbound and outbound transactions. Be sure the connections to and from trading partners are correct.

Your trading partners will need to test everything that starts at their end. Be sure to test every EDI transaction from its start in MAC-PAC to the final destination at your trading partner's business.

6.6 STEPS IN AN EDI SYSTEM

Let's now look at how the EDI process works.
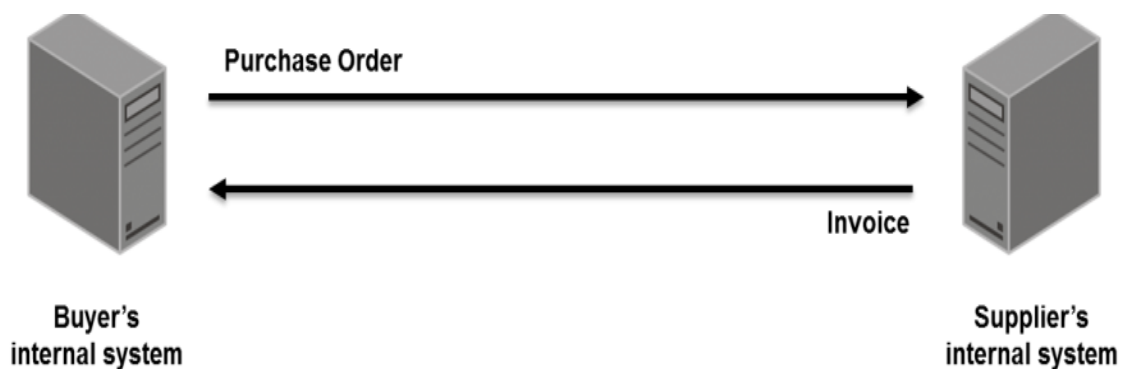
Today, all types of business documents for industries such as retail, automotive, high tech, logistics, and banking can be exchanged using EDI. These documents can flow from the sender's computer straight through to the appropriate application on the receiver's computer.

6.6.1 Sending EDI Documents

To send an EDI document, you need to identify the data, create an EDI document, and transmit it.

- ➤ **Step 1: Identify the data**- The first step is to identify the data you want to include in the purchase order, invoice, advance ship notice, etc. The sources of data and the methods available to generate the electronic document can include:
    1. computer programs that extract data from system databases, such as from a retailer's purchasing system or a shipping company's logistics system;
    2. computer programs that extract data from spreadsheets; and
    3. People keying in the data via web form data entry screens.
- ➤ **Step 2: Create the EDI document**- In this step software converts your internal data into the EDI standard format. This requires specialized translation software that defines how your internal data is to be mapped (i.e. correlated) to the EDI format. Translation software is available to suit just about any computing environment and budget, from large systems that handle thousands of transactions daily to PC-based software that need only process a few hundred or fewer transactions per week.
- ➤ **Step 3: Transmit the EDI document-** There are two basic ways to transmit an EDI document. The first option is to send it directly to your business partner, usually via the internet. The other option is to use the services of an EDI Network Services Provider, in which case you send the EDI document to the Provider, who then makes it available to your business partner. Using a Provider is often the easiest and best approach when you have many business partners, each using a different communications protocol (rules) that you would otherwise need to accommodate.

### 6.6.2 Receiving EDI Documents

Receiving an EDI document is basically the reverse of the sending process:

1. You receive the transmitted EDI document;
2. Your system converts the EDI data for your internal system; and
3. The data is fed into your internal system for processing, such as into a bank's payment origination system or a supplier's order management system.

- ➤ **Step 1: Receive the transmitted EDI document**- As with sending a document, there are two basic options. You can receive the EDI document directly from your business partner or you can use the services of an EDI Network Services Provider, in which case your Provider receives the EDI document from the sender and then makes it available to your internal system.

- ➢ **Step 2: Convert the EDI document**- for your internal system Software now converts the data from the incoming EDI document into the format used by your internal system. This requires specialized translation software that defines how the EDI data is to be mapped (i.e. correlated) to your internal data format. The same specialized translation software that is used to create EDI documents for sending is used in the receiving process.
- ➢ **Step 3: Feed data into your internal system**- for processing your computer application can now automatically feed the translated data into your system, such as your order management system, for immediate processing. Or, often for smaller companies that haven't fully integrated EDI with their internal systems, the incoming data is made available either as a report or on the computer screen.

6.7 APPLICATIONS OF EDI

6.7.1. Retail Sector
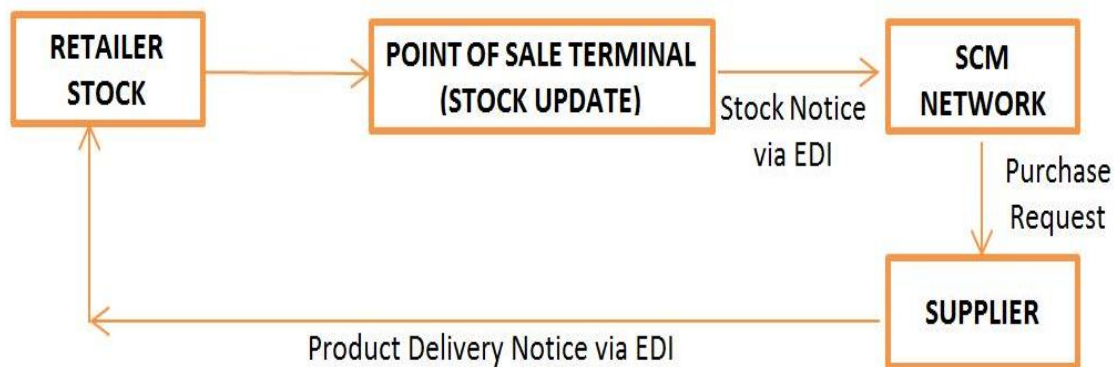
EDI in RETAIL INDUSTRY

In retail sector profit margins usually depend upon efficient inventory management. EDI provides a structured way to maintain goods stocked at a retail outlet. Retailers use a common model stock for each shop location and the point of sale stock position is updated automatically via EDI enabled SCM (Supply chain Management) network.

6.7.2. Manufacturing Sector

EDI ensures effective and efficient management of materials required for production. In manufacturing sector EDI facilitate material requirement planning and just in time manufacturing.
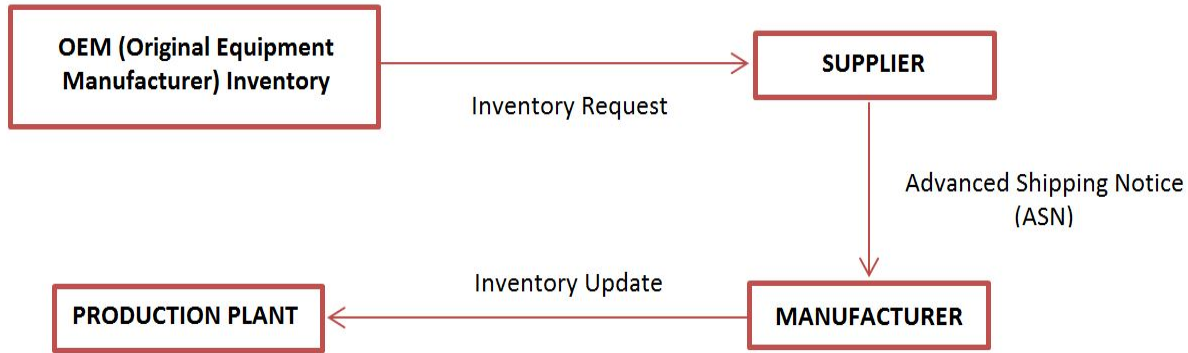
EDI in MANUFACTURING INDUSTRY

6.7.3. Automobile Sector

In automobile sector EDI is used

➢ To provide updated information about product and pricing information to the customer during purchase cycle.

➢ To transmit an advance shipping notice to customer to ensure proper receipt of product

➢ To enable the customer to make payments on receipt of goods via EDI to speed up the payment process.

6.7.4. Financial sector

In this sector EDI replaces the manual activities of collecting, processing and distributing payments with in electronic system.

➢ It facilitates flow of payment between bank account of trading partners without any human intervention.

➢ Using EDI a payee's account is electronically credited and payer's account is electronically debited, such an exchange is referred as EFT (Electronic Fund Transfer).

6.8 BENEFITS OF AN EDI SYSTEM

EDI was developed to solve the problems inherent in paper-based transaction processing and in other forms of electronic communication. In solving these problems, EDI is a tool that enables organizations to reengineer information flows and business processes. Problems with the paper-based transaction system are:

- **Time delays**. Delays are caused primarily by two factors. Paper documents may take days to transport from one location to another. In addition, manual processing delays are caused by the need to key, file, retrieve, and compare data.

- **Labor costs**. In non-EDI systems, manual processing is required for data keying, document storing and retrieving, sorting, matching, reconciling, envelope stuffing, stamping, signing, etc. While automated equipment can help with some of these processes, most managers will agree that labor costs for document processing represents a significant proportion of their overhead.

- **Errors**. Because information is keyed multiple times and documents are transported, stored, and retrieved by people, non-EDI systems tend to be error prone.

- **Uncertainty**. Uncertainty exists in two areas. First, paper transportation and other manual processing delays mean that the time the document is received is uncertain. Once a transaction is sent, the sender does not know when the transaction will be received or when it will be processed. Second, the sender does not even know whether the transaction has not been received at all nor whether the receiver agrees with what was sent in the transaction.

- **High Inventories**. Because of time delays and uncertainties in non EDI processing, inventories are often higher than necessary. Lead times with paper processing are long. In a manufacturing firm, it may be virtually impossible to achieve a just-in-time inventory system with the time delays inherent in non-EDI processing systems.

- **Information Access**. EDI permits user access to a vast amount of detailed transaction data—in a non-EDI environment this is possible only with great effort and time delay. Because EDI data is already in computer-retrievable form, it is subject to automated processing and analysis. Such information helps one retailer, for example, monitor sales of toys by model, color, and customer zip code. This enables the retailer to respond very quickly to changes in consumer taste.

By implementing EDI, many companies add value to their organization by automatically processing information, reducing clerical tasks and eliminating data entry errors.

By using EDI throughout the business cycle results in significant savings of time and resources. Current trading partners benefit from the seamless flow of information and availability of the technology opens doors for new business opportunities.

OTHER BENEFITS INCLUDE

6.8.1 Minimal paper usage

EDI reduces associated expenses of storage, printing, postage, and mailing.

6.8.2. Enhanced quality of data

EDI minimizes data entry errors, improves accounts payable/receivable times and can be used for forecasting. When bad data makes its way into your internal systems, such as your accounts payable or transportation management systems, the results have a negative impact on your business. This includes overpayments, late or underpayments resulting in additional fees, lost revenue due to delays, and poor customer service. The root of most data errors is the keying in of data from a paper document into your internal system. First, if the paper document is handwritten rather than computer-generated, it may be difficult to read, leading to input errors or phone tag to obtain clarification, both of which can cause delays in the business cycle. Even when the document is typed or computer generated and thus legible, keying errors can still occur. In the order entry process, these errors can result in shipping the wrong product, in the wrong quantity, at the wrong price, to the wrong address. The electronic capture of business documents enables critical business data to be fed directly into your internal systems without relying on error prone, manual re-keying, which is required when you use paper-based or email-based processes. Having more accurate data means that the entire supply chain is more efficient.

6.8.3. Improved turnaround times

We have just discussed how manual data entry can greatly slow the business cycle. In addition, when using postal mail, your documents will take days to arrive. Sometimes, it may be weeks before you discover that the mail has been lost. Delivery services such as UPS and FedEx are very reliable but quite costly. And even with faxes, documents can remain at the fax machine or sit on someone's desk before any action is taken. In contrast, EDI transactions can be exchanged in minutes instead of the days or weeks associated with postal mail. Furthermore, there is significant time saved by the elimination of data re-keying and its high error rate, which results in time-consuming corrective actions. For many companies that use EDI, transactions that used to take five days using paper can be completed in under an hour. This reduced cycle time leads to faster payments and thus improved cash flow. Cash is no longer tied up in inventory or goods in transit and, therefore, can be applied to other areas of the business.

6.8.4. Improved timelines

EDI transfer ensures real-time processing and eliminates times associated with manually sending, receiving and entering orders.

6.8.5. Costs saving in operational efficiency

EDI reduces the time it takes your staff to manually create invoices and process purchase orders. EDI reduces the costs of personnel, supplies, and office and storage space. Since paper documents are replaced by EDI transactions, expenses associated with paper—printing, reproduction, storage, filing, postage, and document retrieval— are all reduced or eliminated. Moving from a manual to an EDI process frees up personnel to concentrate on other aspects of the business.

6.8.6. Improved data security and ease of auditing

In this highly competitive, international world of business, data security is paramount to the success of a company. Documents that circulate in an office or that can be changed by several people may not be secure. With fully integrated EDI, in which data flows directly from computer to computer, data can be exchanged in a highly secure environment. In addition to keys and passwords to protect the data, encryption and decryption programs are used, so that even during the few seconds it takes to transmit the data from sender to receiver the data is secure. Even when an EDI Network Services Provider is used to perform translation, there can be "encryption at rest" programs, so no one at the Provider's data center can see or violate the data. Of course, in today's environment, it is necessary for companies to install firewalls in their own data centers to prevent hackers from stealing data. But this is true of internal systems, whether you use EDI or not. Corporate auditing is made easier and faster since the EDI process eliminates many of the discrepancies and problems that can creep into a paper-based system. Moreover, all the EDI transactions can be made easily available to the auditor in reports, thereby improving accuracy and reducing productivity loss during the auditing process.

6.8.7 Strategic business benefits

Beyond the direct cost and time-saving benefits of EDI described above, it provides the foundational technology that, when combined with other collaborative commerce capabilities available today, enables dramatic strategic benefits. For example, in today's fast-paced business environment, electronic transactions enable real-time visibility into transaction status. This, in turn, enables faster decision-making and improved responsiveness to changing customer and market

demands. In some industries, EDI enables businesses to adopt a demand-driven business model rather than a supply driven one, because it shortens the lead times for product enhancements and new product delivery, streamlines the ability to enter new territories and markets, and provides a common business language that facilitates the communication and collaboration of businesses throughout the world. Moreover, EDI promotes corporate social responsibility and sustainability by eliminating paper from the supply chain and replacing paper-based processes with "green" electronic alternatives. This will both save you money and make your company part of the solution to our overall "carbon footprint." As we have seen, the benefits of using EDI are many and have a far-reaching effect throughout the company. Later, we will examine how EDI brings benefits to specific business processes, such as ordering, invoicing, receiving, and payments.

6.9 LIMITATIONS OF EDI

While countless businesses enjoy the benefits of EDI, some companies are still cautious to try it out due to the following limitations of EDI.

- **Cost of Implementation**

It is true that EDI provides massive cost savings benefits but for small businesses re-designing and implementing software applications to fit in EDI into current applications can be quite costly. Such limitations of EDI must be considered if you plan on implementing such system.

- **Electronic System Safety**

EDI also necessitates substantial investment in computer networks and security systems for maximum security. Any EDI system installed would require protection from hacking, malware, viruses, and other cyber security threats.

- **Preliminary Setup Consumes Time**

Not only is the implementation of EDI system expensive to install, but it also consumes a considerable amount of time to set up the essential parts. Thus, such limitations of EDI can hinder fast-tracking of services if urgently required.

- **Several Standards to Maintain**

Numerous businesses looking to implement EDI also consider the several standards involved. These limitations of EDI do not allow small businesses to exchange data with larger establishments that make use of latest edition of a document standard. Some known measures include ANSI ASC X12, GS1 EDI, HL7, TRADACOMS, and UN/EDIFACT.

- **Suitable Backup System**

EDI implementation also requires regular maintenance as the business functionality is highly dependent on it. Some robust data backup system is needed in case of system crash or for statistical purpose. Such limitations of EDI can cost some substantial amount to implement.

6.10 E-COMMERCE SECURITY SYSTEM

Security is an essential part of any transaction that takes place over the internet. Customers will lose his/her faith in e-business if its security is compromised. Following are the essential requirements for safe e-payments/transactions −

- **Confidentiality** − Information should not be accessible to an unauthorized person. It should not be intercepted during the transmission.

- **Integrity** − Information should not be altered during its transmission over the network.

- **Availability** − Information should be available wherever and whenever required within a time limit specified.

- **Authenticity** − There should be a mechanism to authenticate a user before giving him/her an access to the required information.

- **Non-Reputability** − It is the protection against the denial of order or denial of payment. Once a sender sends a message, the sender should not be able to deny sending the message. Similarly, the recipient of message should not be able to deny the receipt.

- **Encryption** − Information should be encrypted and decrypted only by an authorized user.

- **Auditability** − Data should be recorded in such a way that it can be audited for integrity requirements.

6.10.1 Measures to ensure Security

Major security measures are following −

- **Encryption** − It is a very effective and practical way to safeguard the data being transmitted over the network. Sender of the information encrypts the data using a secret code and only the specified receiver can decrypt the data using the same or a different secret code.

- **Digital Signature** − Digital signature ensures the authenticity of the information. A digital signature is an e-signature authenticated through encryption and password.

- **Security Certificates** − Security certificate is a unique digital id used to verify the identity of an individual website or user.

6.10.2 Security Protocols in Internet

We will discuss here some of the popular protocols used over the internet to ensure secured online transactions.

Secure Socket Layer (SSL): It is the most commonly used protocol and is widely used across the industry. It meets following security requirements −

- Authentication

- Encryption

- Integrity

- Non-reputability

"https://" is to be used for HTTP URL's with SSL, whereas "http:/" is to be used for HTTP URL's without SSL.

Secure Hypertext Transfer Protocol (SHTTP)
SHTTP extends the HTTP internet protocol with public key encryption, authentication, and digital signature over the internet. Secure HTTP supports multiple security mechanism, providing security to the end-users. SHTTP works by negotiating encryption scheme types used between the client and the server.

Secure Electronic Transaction

It is a secure protocol developed by MasterCard and Visa in collaboration. Theoretically, it is the best security protocol. It has the following components −

- **Card Holder's Digital Wallet Software** − Digital Wallet allows the card holder to make secure purchases online via point and click interface.

- **Merchant Software** − this software helps merchants to communicate with potential customers and financial institutions in a secure manner.

- **Payment Gateway Server Software** − Payment gateway provides automatic and standard payment process. It supports the process for merchant's certificate request.

- **Certificate Authority Software** − this software is used by financial institutions to issue digital certificates to card holders and merchants, and to enable them to register their account agreements for secure electronic commerce.

6.10.3 Common Ecommerce Security Threats & Issues
There are quite a few threats you need to protect your online store from. Let's touch on a few common ones that often plague online businesses.

➢ *Financial Frauds*

Financial fraud has afflicted online businesses since their inception. Hackers make unauthorized transactions and wipe out the trail costing businesses significant amounts of losses. Some fraudsters also file requests for fake refunds or returns. Refund fraud is a common financial fraud where businesses refund illegally acquired products or damaged goods. For instance, Jimmy likes to capitalize on fraudulent activities. He knows that friendly fraud is an easy medium where he can purchase an item, use it, and then refund it in order to get his money back, so he does it!

➢ *Spam*

Where emails are known as a strong medium for higher sales, it also remains one of the highly used medium for spamming. Nonetheless, comments on your blog or contact forms are also an open invitation for online spammers where they leave infected links in order to harm you. They often send them via social media inbox and wait for you to click on such messages. Moreover, spamming not only affects your website's security, but it also damages your website speed too.

➢ *Phishing*

It is one of the common security threats of ecommerce where hackers masquerade as legitimate businesses and send emails to your clients to trick them into revealing their sensitive information by simply presenting them with a fake copy of your legitimate website or anything that allows the customer to believe the request is coming from the business.

Common phishing techniques include emailing your customers or your team with fake "you must take this action" messages. This technique only works your customers follow through with the action and provide them access to their login information or other personal data which the hacker can exploit as per his benefit.

➢ *Bots*

You may recognize bots from your good books such as those that crawl the web and help you rank your website in Search Engine Result Pages. However, there are exclusive bots developed to scrape websites for their pricing and inventory information. The hackers use such information to change the pricing of your online store, or to garner the best-selling inventory in shopping carts, resulting in a decline in sales and revenue.

➢ *DDoS Attacks*

Distributed Denial of Service (DDoS) attacks and DOS (Denial of Service) attacks aim to disrupt your website and affect overall sales. These attacks flood your servers with numerous requests until they succumb to them and your website crashes.

➢ **Brute Force Attacks**

These attacks target your online store's admin panel in an attempt to figure out your password by brute-force. It uses programs that establish a connection to your website and use every possible combination to crack your password. You can protect yourself against such attacks by using a strong, complex password. Do remember to change it regularly.

➢ **SQL Injections**

SQL injections are cyber-attacks intended to access your database by targeting your query submission forms. They inject malicious code in your database, collect the data and then delete it later on.

➢ **XSS**

Hackers target your website visitors by infecting your online store with malign code. You can safeguard yourself against it by implementing Content Security Policy.

➢ **Trojan Horses**

Admins and customers might have Trojan Horses downloaded on their systems. It is one amongst the worst network security threats where attackers use these programs to swipe sensitive information from their computers with ease.

6.10.4 Ecommerce Security Solutions

Security issues in ecommerce are not something online businesses can neglect. In fact it should be a priority for most online stores so their customers are able to enjoy a smooth and safe shopping experience. Your ecommerce security lets your customers protect themselves from cyber-attacks and fraud. The better your security protocols are, the better your brand will uphold its reputation and earn the trust of the customers. Ecommerce stores with ideal security have some features in common. They don't economize on robust hardware; they don't rely too heavily on third-party apps or plugins like adobe flash. Let's further breakdown these features so that you do not have to face any security issues in ecommerce.

✓ **Switch to HTTPS**

Using outdated HTTP protocols makes you vulnerable to attacks. I strongly recommend that you switch to HTTPS which displays the trustee green lock sign that says "secured" next to the URL bar on your customer's computer. HTTPS protocols not only protect the sensitive information users submit, but their user data as well.

Since HTTP protocols are mostly defunct now, most modern browsers display a message warning the user from proceeding further because the website is insecure. Not just that, some browsers out rightly blocks the user from accessing the site.

Another benefit you get from upgrading to HTTPS is higher ranking on Google's search page since Google considers HTTPS as a ranking factor.

Before you make that switch, you must purchase an SSL certification from your hosting company. Having an up-to-date SSL certificate and HTTPS protocol has become the standard, so it's crucial that you obtain them if you wish to get any considerable traffic.

✓ *Secure Your Servers and Admin Panels*

Most ecommerce platforms come with default passwords that are ridiculously easy to guess. And if you don't change them you are exposing yourself to preventable hacks. Use complex password(s) and usernames and change them frequently.

You can go one step further and make the panel notify you every time an unknown IP attempts to log in. These simple steps can significantly improve your web store's security.

✓ *Payment Gateway Security*

While it may make processing payments more convenient, having credit card numbers stored on your database is a liability. It's nothing less than an open invitation for hackers where you put your brand's reputation and your customer's sensitive information on the line.

If you fall victim to a security breach, and hackers get their hands on credit card data, all you can do is to say goodbye to your business because the heavy fines will force you into bankruptcy.

In order to save your business from this terrible fate, you should never store credit card information on your servers and ensure your payment gateways security is not at risk. Additionally, you can use third-party payment processing systems to carry out the process off-site. Popular options include PayPal, Stripe, and Wordplay.

When it comes to ecommerce recommendations, you must obtain a Payment Card Industry Data Security Standard (PCI DSS) accreditation.

✓ **Antivirus and Anti-Malware Software**

Hackers can use stolen credit card information to place orders from anywhere in the world. Antivirus or anti-fraud software can help you with this serious ecommerce issue. They use sophisticated algorithms to flag any malicious transactions to help you can take further action. They provide a fraud risk score which can help proprietors determine if a certain transaction is legitimate.

✓ **Use Firewalls**

Another effective ecommerce recommendation is to use firewall software and plugins that are pocket-friendly yet effective. They keep untrusted networks at bay and regulate traffic that enters and leaves your site. It offers selective permeability and only allows trusted traffic in. They also protect against cyber threats such as SQL injections and cross-site scripting.

✓ **Secure your website with SSL certificates**

Secure sockets layer (SSL) certificates are files that link a key to transactions on different paths on a network. These certificates are associated with credit card details and transactions to regular queries. SSL certificates encrypt data to protect it from interception in between different destinations. The information you send from your end to the server is secure.

If you want to conduct any type of business on your site, you require SSL certificates, so that every process that takes place on your site is secure. Besides, it provides you with a certificate of ownership so hackers can't use your site as a counterfeit for phishing.

✓ **Employ Multi-Layer Security**

You can fortify your security by using various layers of security. You can use a wide-spread Content Delivery Network or CDN to protect your site against DDoS attacks and malevolent incoming traffic. They do so by utilizing machine learning to filter out the malicious traffic from regular traffic.

You can also use two-factor authentication to squeeze in an additional layer of security. Two-factor authorization requires a standard username and password combination as well as an extra code that is sent as an email to the user or as an SMS to their provided phone number. This ensures that only the user can access the service even if their username and password are at risk.

✓ **Ecommerce Security Plugins**

Security plugins are a simple way to enforce security protection on your website. They provide protection against bad bots, SQLi, XSS, code injections and hundreds of other severe attacks. One of the most secure, easy to implement, feature rich security plugin is Astra. It helps automatically secure your site and virtually patch software by preventing malicious requests from ever reaching your website.

✓ *Backup Your Data*

Data loss due to hardware malfunction or cyber-attacks is not uncommon. And if you don't backup your data regularly, you are at the risk of losing it for good. You should do it yourself and not trust anyone else to do it for you. Employ automatic backup service so that even if you forget to do it manually, all your data will be backed up automatically.

You can go one step further and make a copy of the backup, so you will have a contingency plan available if you lose your original backup. Another option is to choose a managed ecommerce web hosting service that automatically creates backups for you, like Cloudways.

✓ *Stay Updated*

The importance of regularly updating WordPress core, security tools, and plugins can be stressful, however, install security updates and patches as soon as they release because hackers can use bots that identify which websites use outdated software. That makes outdated software a serious liability.

✓ *Opt for a Solid Ecommerce Platform*

It is important that you choose a secure ecommerce platform that regularly updates itself and offers top-notch security. Ecommerce platform tools safeguard you against common threats and frequently provide you with updates. PrestaShop, Magento and WooCommerce are some popular choices.

✓ *Train Your Staff Better*

Your staff should be aware of laws and policies pertaining to the protection of user information. They should not share login credentials, and you should review the personnel who have access to sensitive customer information.

Once your employee tenders their resignation, expunge their details and revoke all their access to keep them from committing a cybercrime against your business.

✓ *Keep an Eye out for Malicious Activity*

If you don't want any malicious attack to go under the red carpet, you should keep your eyes open for any suspicious activity. This can save you a lot of trouble – not to mention revenue – since you can potentially catch a fraudulent transaction before it can take place. You can utilize special monitoring software that tracks the activity in real time and notifies you of any questionable transaction.

✓ **Educate Your Clients**

Some lapses in security don't happen at your end but your client's. They might be using weak passwords or they might deliver sensitive information on phishing sites and in the hands of hackers. You can solve these ecommerce security threats by educating your customers. Educate them about the risks associated with unsafe security practices. You can demand strong passwords and introduce them to how phishing works.

Strong passwords require a good combination of characters, symbols, and numbers that are near-impossible to brute-force or guess. You can also keep users away from creating profiles with weak passwords. You can also adopt the two-factor authentication system in case they are using weak passwords. Or if the user submitted information is sensitive and susceptible to hacking.

Give these approaches due consideration because some customers might consider them a hassle and might just leave your website altogether. Do ensure that you aren't making your customers jump through unnecessary hoops.

Or you can bypass this whole process and simply let them sign up via Facebook or Google which offer world-class cyber security.

6.11 SUMMARY

Electronic data interchange (EDI) is the use of computer and telecommunication technology to move data between or within organizations in a structured, computer retrievable data format that permits information to be transferred from a computer program in one location to a computer program in another location, without manual intervention. In EDI, paper documents are replaced with electronic documents such as word documents, spreadsheets, etc. Business entities conducting business electronically are called **trading partners**. The entire process is nothing more than the transfer of information from the seller's computer to the customer's computer. EDI makes it possible to minimize or even eliminate the manual steps involved in this transfer.

6.12 KEYWORDS

EDI: Electronic Data Interchange (EDI) is the electronic interchange of business information using a standardized format; a process which allows one company to send information to another company electronically rather than with paper.

EFT: Electronic funds transfer (EFT) are electronic transfer of money from one bank account to another, either within a single financial institution or across multiple institutions, via computer-based systems, without the direct intervention of bank staff.

FEDI: Financial EDI (FEDI) is the computer-to-computer exchange of payment and payment-related information between companies using a standard format.

VAN: A value-added network (VAN) is a hosted service offering that acts as an intermediary between business partners sharing standards based or proprietary data via shared business processes. The offered service is referred to as "value-added network services".

E-commerce: Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions.

SSL: Secure Sockets Layer (SSL) is standard security technologies for establishing an encrypted links between a server and a client—typically a web server (website) and a browser, or a mail server and a mail client (e.g., Outlook).

SHTTP: S-HTTP (Secure HTTP) is an extension to the Hypertext Transfer Protocol (HTTP) that allows the secure exchange of files on the World Wide Web.

6.13 Self-assessment Tests

(a) Student Activities

Q1. Describe Electronic data Interchange with a suitable example.

Q2. Why do we need EDI and how to implement EDI?

Q3. What are the basic components required to implement an EDI?

Q4. Describe various kinds of document exchanged during EDI.

Q5. Describe the various application areas of EDI.

Q6. What are the advantages and disadvantages of EDI?

Q7. Discuss the common Ecommerce security threats & issues.

Q8. Discuss the Ecommerce Security Solutions.

Q9. Discuss about Security Protocols in Internet.

Q10. Explain e-commerce security system

(b) Learning Activities

1. _____ is an extension to the Hypertext Transfer Protocol (HTTP) that allows the secure exchange of files on the World Wide Web.

2. _____ is standard security technologies for establishing an encrypted links between a server and a client.

3. _____ a process which allows one company to send information to another company electronically rather than with paper.

4. _____ attack flood your servers with numerous requests until they succumb to them and your website crashes.

5. The security threat in which hackers masquerade as legitimate businesses and send emails to your clients to trick them into revealing their sensitive information by simply presenting them with a fake copy of your legitimate website is known as _____.

(c) Feedback of learning activities

Answers of learning activities:

1. S-HTTP
2. Secure Sockets Layer
3. Electronic Data Interchange
4. Denial of Service
5. Phishing

6.14 Study Tips

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Subject: E-Commerce	
Course Code: BC- 204	Author: Mr. Balwant Kumar
Lesson : M-Commerce and E-Governance	Vetter: Prof. Dharmender Kumar,

LESSON STRUCTURE

7.0 Learning Objectives

In this chapter you will learn about

- ➢ M-Commerce and Wireless communication technology
- ➢ Scope of mobile--commerce
- ➢ Principles of mobile commerce
- ➢ Benefits of mobile commerce
- ➢ Limitations of mobile commerce
- ➢ Mobile commerce framework
- ➢ Mobile commerce business models
- ➢ M-commerce applications
- ➢ E-government and E-governance
- ➢ Stages of E-governance
- ➢ Importance of E-government
- ➢ National E-governance Plan
- ➢ Need of E-governance
- ➢ E-governance experiences in India

7.1 Assessment of prior Knowledge

This chapter introduces the M-commerce and E-governance. Mobile Commerce, also known as m-commerce, is defined as the process of performing business transactions using handheld mobile devices which are connected through wireless networks. E-Governance is defined as the use of information and communication technologies, and particularly the internet, as a tool to achieve better government. Section 7.3 to 7.12 discusses about the M-commerce and section 7.13 to 7.21 discusses about E-governance.

7.2 M-COMMERCE

Mobile Commerce, also known as m-commerce, is defined as the process of performing business transactions using handheld mobile devices which are connected through wireless networks. The business transactions may range from buying and selling goods, making mobile payments, downloading audio/video contents, playing online games, using numerous software applications or getting mobile tickets. The mobile devices include cellular phones, handheld computers such as palmtops or laptops, pagers, smartphones and Personal Digital Assistants (PDA). The mobile users can access internet through these devices without any wired connection or a computer. Powered with the emerging technology based on Wireless Application Protocol (WAP), m-

commerce employs web ready micro browsers in these mobile devices to surf through the internet anytime, anywhere on earth.

WAP-enabled smartphones equipped with Bluetooth technology offer fax, e-mail and phone capabilities to the user to facilitate business transactions while in transit. Such smartphones are becoming so popular that most business houses have adopted m-commerce as the more efficient method of reaching to the customers or communicating with other business partners. The content delivery over wireless mobile devices has become much faster, safer as well as cheaper. The reservation of air/rail/bus tickets through mobile devices saves time and offers peace of mind to numerous passengers. Such services are gradually making m-commerce as the method of choice for performing digital business transactions. For these reasons, m-commerce is sometimes referred to as next generation e-commerce.

7.3 WIRELESS COMMUNICATION TECHNOLOGY

Mobile commerce is based on wireless communication technology. The wireless communication technology has emerged as the new choice of modern corporate world. The wireless networking has some distinct advantages over traditional wired networking that employs co-axial, twisted pair or fibre optic cables for physical connection between two or more computing devices. In wireless networking, the data transfer between computers is facilitated by microwaves, radio waves or infrared waves. It eliminates the cumbersome cabling process involving bulky cables with a significant reduction in labour and material cost as well as development time. The wireless networking technology together with wireless application protocol provides the backbone of mobile commerce applications. In various vertical markets, such as retail, health care, manufacturing and warehousing, mobile commerce gained acceptance and provided increased productivity through the usage of mobile devices. The mobile handheld devices are used to transmit data in real time to centralized hosts through wireless networks.

The mobile commerce that employs wireless technology, offers some extra advantage over the internet based e-commerce. In e-commerce, the internet provides information anytime of the day, while in m-commerce; the information is available anytime, anywhere. In e-commerce, the information is available as long as the user is connected with the internet, i.e. connected with the wired network. If the user is involved with some other activities, i.e. travelling or doing some offline job, which forces him/her to become disconnected from the internet, the information

becomes unavailable. M-commerce removes such uncertainties. Wireless networking allows the user to be connected with the wireless internet even if he/she is on the move. Thus, in m-commerce, it is possible to stay online anywhere on earth and anytime of the day. The user can access information instantly even if he/she is engaged in some other activities, such as travelling or shopping, with the help of the mobile device and the wireless network or internet. This helps the employees to make spot decisions, the customers to ask questions spontaneously and business owners to perform transactions anytime regardless of their geo-graphical positions.

7.4   SCOPE OF MOBILE COMMERCE

Mobile commerce provides instant connectivity between mobile users irrespective of their geographical location and time of the day. With enormous growth of wireless and mobile technology and rapid penetration of mobile phones in developing countries worldwide, the scope of m-commerce has increased manifold. With the advent of super-fast 3G access technology that' ensures high speed data transfer rates of the order of 20 Mbps, m-commerce is opening up new vistas of digital media applications. 3G technology, equipped with WiMax and UMTS standards for high speed mobile broadband internet connectivity, supports mobile multimedia application delivery at far greater bandwidths. So, it is now possible for mobile users to watch their favourite TV programmes or download and view famous movies in their mobile devices while travelling.

The scope of mobile commerce is all pervasive, and is gradually engulfing all aspects of lives of modern day citizens. Ranging from mobile banking, mobile browsing and mobile ticketing up to mobile marketing, mobile advertising and mobile computing, mobile commerce is gradually becoming an integral part of both corporate world and common people. With the prices of mobile phone decreasing exponentially and the number of different mobile applications increasing enormously, more and more people will indulge in m-commerce applications and soon it will become the preferred choice of the digital business world.
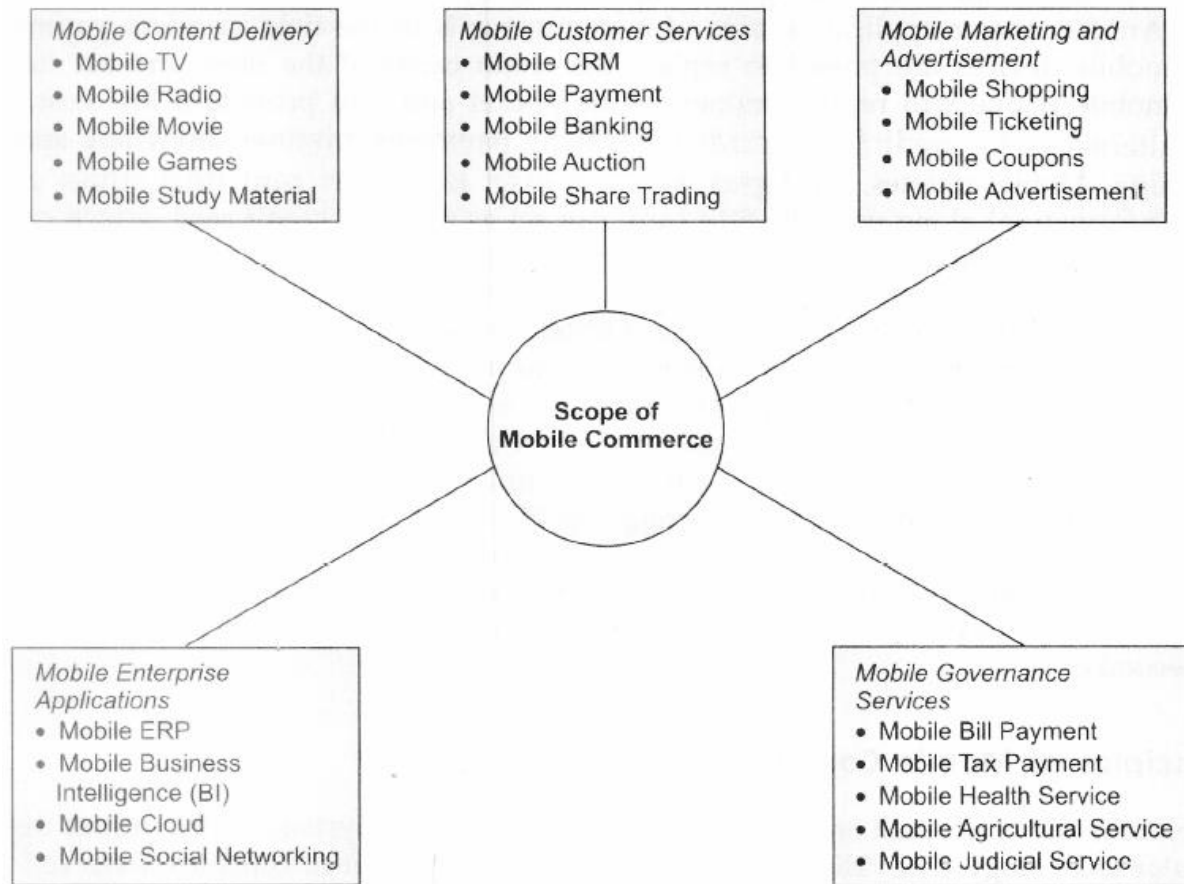
Fig.1: Scope of Mobile Commerce.

7.5 PRINCIPLES OF MOBILE COMMERCE

Mobile commerce is based on wireless mobile communication system, which utilizes digital cellular technology. The cellular network consists of a number of cell sites. Each cell site consists of a stationary base station (a radio frequency transceiver), an adjacent tower antenna (for transmission and reception of signals) and a surrounding cell (a hexagonal shaped geographical area). Each cell is allotted a band of radio frequencies and provides coverage to any portable mobile device that comes within the geographical range of the cell. Whenever a mobile device such as a mobile phone or a pager, etc., comes inside a cell, it starts communicating with the base station using one of the cell frequencies. The· base station receives the signal from the mobile device and transmits using the tower antenna to a distant base station for call delivery. To distinguish signals received from different mobile devices at the same base station, different access technologies such as Frequency Division Multiple Access (FDMA), Code Division

Multiple Access (COMA) or Time Division Multiple Access (TDMA) are used. Whenever a mobile user tends to move away from one cell to another adjacent cell, the cell frequency switching occurs, whereby the old cell frequency is dropped and the mobile device is automatically allotted a new frequency corresponding to the adjacent base station. The mobile device switches from previous base station frequency to current base station frequency and the communication with the new base station continues without interruption. This is known as cell handover. There are a number of different digital cellular technologies which are used in various mobile phone networks worldwide. These are: Global System for Mobile (GSM) Communication, General Packet Radio Service (GPRS), and Enhanced Data Rates for GSM Evolution (EDGE), Digital Enhanced Cordless Telecommunications (DECT), etc.

The geographical location of a base station is fixed, i.e. stationary and the frequency band and location of each base station are registered in the database of a centralized Mobile Telecommunication Switching Office (MTSO). So, whenever a mobile device changes position from one cell site to another, its geographical location can be easily tracked from MTSO. Utilizing this fact, mobile commerce offers a number of location-based services, such as tracking and monitoring of people/vehicles, identifying or discovering nearest ATM machines/banks/hospitals/restaurants and local weather/traffic reports. People tracking can help in criminal investigation where the mobile phone used by a criminal can be tracked and its location is identified. The vehicle tracking is utilized in finding out the actual position of the goods to be delivered and helps in supply chain operation management. The local traffic and weather report can be generated in a local office and delivered to the mobile phone of a user on request. The local bank/ ATM/ hospital/restaurant info can also be delivered to a mobile user at a minimal cost.

7.6   BENEFITS OF MOBILE COMMERCE

The main advantage of mobile commerce is that it provides instant connectivity to the mobile user, irrespective of his/her geographical location and time of the day. The mobile user can stay connected with his/her business network and gather information even if he/she is in transit and remotely located away from the business installation. The same light weight mobile device can be used for making business transactions or making online payments round-the-clock in a cost-effective way. Highly personalized information can be delivered in the mobile device in an

efficient manner to satisfy numerous needs of a large number of customers. The major benefits of mobile commerce are as follows:

Anytime Anywhere

Mobile commerce together with wireless communication technology and wireless broadband internet access, keeps the mobile user connected with the internet while travelling across the globe. The business information is available to the mobile user any time of the day and anywhere around the globe. This anytime/anywhere internet access makes business transactions more flexible and customer communications more efficient, which in turn improves the productivity of the company and increases customer satisfaction. The valuable market information, stock/share prices, inventory position, delivery schedule, etc. are instantly available at the fingertips. Handheld devices, such as Blackberry, etc. work on internet mode and allow users to continuously send/receive electronic mail, download news alerts, stock prices and receive weather updates. The round the clock (24 x 7) internet availability benefits many users to conduct business transactions from their homes or from any other place while on the move and at any convenient time. Thus m-commerce offers greater mobility and flexibility to mobile users in performing business transactions using their handheld mobile devices.

Cost-effective

The costs of transactions using mobile devices are relatively low. The time-critical business data, such as reports, photographs, etc. can be captured and transmitted easily from the mobile devices without involving any bulky expensive equipment. The customer queries can be attended and support provided instantly from the mobile device, thus making customer support more comprehensive. The SMS-based micro payments facilitate bank account transfer within a few seconds and at the cost of an SMS. Contact less smartcard based mobile payments provide a low cost alternative for toll tax payments in mass transit systems. In case of mobile billing, users can pay for electricity bills, telephone bills, petrol, grocery, etc. through their mobile phones. The payments made in the mobile phones for such items will appear as part of their mobile phone bills, thus eliminating the need' for a third party payment mechanism such as, credit cards. This reduces the cost of payment to a large extent.

Personalized Service

Mobile commerce offers a number of personalized services to the mobile users depending on their

various requirements and purposes. The digital cellular technology can monitor the location of user performing mobile transactions. Knowledge of the user's location may be used to deliver timely and useful contents such as product availability and discount information to the potential customer. Timely information, such as flight schedules and flight availability can be delivered to the user at the last minute. Delivery of time critical as well as emergency information, SMS- based notifications and alerts can be easily made if the location of the user is tracked. The location tracking is also utilized in offering customized services to the user, such as delivery of discount coupons that can be cashed in and around of the location of the customer. Delivery of regional maps, driving directions and online directories are also possible if the location of the mobile user is known. Another major advantage-of location tracking is that, in criminal investigation, the location of the mobile user can be monitored and recorded as part of the investigation process.

7.7 LIMITATIONS OF MOBILE COMMERCE

Although mobile commerce has some distinctive advantages, such as instant connectivity and location and time independence over electronic commerce and offers low cost personalized services to the mobile users, it suffers from some serious limitations which restrict its use in mainstream business world. The mobile device limitations, such as small screen size, small memory capacity and lower processor speed makes it unsuitable for high quality internet graphics applications. The limited availability of bandwidth to various mobile operators imposes a limitation on the speed of operation of different mobile commerce applications. The wireless networks used in mobile commerce are more vulnerable to external hacker attacks compared to wired networks and stringent security arrangements in the form of encryption and authentication should be adopted to prevent unwanted intrusions. The main disadvantages of mobile commerce are explained in detail below.

(1) Mobile Device Limitations
1. Small screen size: Mobile devices have smaller screen size (of the order of 2 by 3 inches) and poor resolution which makes them inconvenient for browsing applications. Data entry can be quite difficult using small combinational keypad that comes with most of the mobile handheld devices. The wide and high resolution screens in conventional desktops or laptops used in e- commerce applications offer ease of use in data entry operations as well as viewing web pages. These larger screens support 1920 x 1080 resolution and 3D graphics display. Although mobile devices offer

greater mobility and flexibility in accessing information, the smaller screen size restricts the amount of information that could be presented and offers a less convenient user interface in the form of menu-based scroll-and-click mode of data entry.

2. Low speed processor: Most mobile devices come with low-powered processors with much lower processing speed compared to sophisticated processors (i.e. core 2 duo or i-core series) used in desktops or laptops. Such low speed processors restrict the download speed in most mobile commerce applications. The applications requiring too much processing power should be avoided as they may become irritably slow due to low speed processors. Also, keeping the low processor speed in mind, the mobile websites must be optimized to ensure customer satisfaction. Unnecessary plug-ins, flash images and animations should be removed to ensure speed of delivery.

3. Small memory capacity: The mobile devices do not have large storage space. The memory capacity in mobile devices is in the order of 5 GB to 10 GB compared to 2 TB or higher used in desktops/laptops. So, it is difficult to store large video files in mobile devices for future use. The mobile application developers must be concerned about the size of their applications during the development phase.

4. Low power backup: Mobile devices use batteries as their power supply. Normally, power for a mobile device lasts up to 2-3 days, depending on the size of the device. After this period, the battery should be recharged again, and it adds an additional burden to the user who has to remember every now and then to recharge it.

(2) Wireless Network Limitations

Mobile commerce depends on wireless networks which are usually of lower speed compared to wired networks. In many cases, wireless networks offer one-fourth speed of standard wired network. Also, most wireless networks are more common in urban areas and some of the rural areas might not have wireless communication facilities. So online mobile services may become unavailable in some rural areas, and thus the popularity of mobile services may be suffered. Unless the mobile device is 2.SG or 3G technologies compatible, the applications will become sluggish and unreliable compared to wired network applications. Atmospheric interference and fading of signals transmitted through wireless networks sometimes cause severe data errors and may even lead to disconnections.

(3) Bandwidth Restrictions

A major disadvantage of mobile commerce is the bandwidth limitation, which imposes a limitation on speed of operation in various m-commerce applications. Wireless networks use frequency spectrum to transmit information across the network. Regulatory bodies control the use of available frequency spectrum and allocate the spectrum to various mobile operators. In India, the frequency spectrum were initially allocated and regulated by Department of Telecommunication (DoT). Later, the Telecom Regulatory Authority of India (TRAI) was set up to control the usage of frequency spectrum. The limited availability of bandwidth to various mobile operators in turn restricts the data rate in mobile commerce applications. The GSM technology offers the data rate of the order of 10 Kbps and 3G technology can go up to 10 Mbps.

(4) Security Issues

Another concern that is often raised in connection with mobile commerce is the security issue. Mobile devices are more vulnerable to theft, loss and mishandling. Special care must be taken to ensure that the security and privacy of the mobile customer are not compromised at the event of loss of a mobile device. This includes not storing sensitive information in the mobile devices and changing/locking of PIN (password fast and simple at the time of need.

Mobile commerce employs public wireless networks for transmission of signals which can be easily intercepted by hackers for capturing/ altering stream of data travelling through the wireless medium. In wired networks, in order to gain access, the intruder has to gain physical access to the wired infrastructure. In wireless networks, anyone with the ability to receive signal in a mobile device can gain access to the network. In order to protect the wireless network from unwanted users, various encryption and authentication techniques should be employed. As the handheld devices have limited computing power and storage capacity, it is difficult to employ 256 bit encryption technique that requires enough computing power. However, the SIM cards inside a cell phone can include the digital signatures of PKI system. Thus, the PKI system of digital signatures can be integrated in a mobile device that adds to the security of the mobile application.

Authentication of mobile devices prior to carrying out any financial transaction is another important issue. The Subscriber Identity Module (SIM) stores the subscriber identity in the form of cryptographic keys. The authentication server of the wireless network stores the matching keys and verifies the user identity prior to any transaction. Though it is far easier to intercept signals over wireless networks, the encryption and authentication mechanism makes it harder to decipher

by the unwanted user.

7.8   MOBILE COMMERCE FRAMEWORK

Despite of the described limitations, numbers of people performing m-commerce transactions are growing exponentially. As in-commerce provides mobility to busy professionals, more and more people tend to access internet through their mobile phones. People find it more convenient to shift from e-commerce to m-commerce. And the projected global revenue from m-commerce is expected to cross 400 billion USD, during 2015. The day-to-day functioning of individuals as well as corporations is being transformed to mobile applications and is embedded in mobile devices. The mobile network operators have started providing value-added services that supports the new concepts of anytime anywhere computing. Accordingly, a new mobile business model has emerged, which is based on shared revenue distribution through sales in respective channels. For example, in mobile retail, a diverse range of mobile applications are developed to enable the multi-channel retailer to perform the key functions, such as mobile promotions, mobile payment, product information display, order management, catalogue management, create and display shopping list, loyalty programmes and other value-added services. Similarly, in travel industry, location-based tourism, mobile ticketing, navigational guidance and local weather/and traffic information delivery results in new revenue generating opportunities.

In order to make these value-added services work efficiently, and in a cost-effective manner, perfect collaboration between various network providers, technology providers and application developers is required. In order to integrate different mobile services, applications and technologies in a well-coordinated and controlled architecture, a mobile commerce framework needs to be developed. The purpose of the framework is to develop a structured integration of mobile services, applications and technology resources so that it will be able to deliver diverse range of value-added services in different industry sectors, and at the same time aim to reduce operating cost and improve efficiency to attract the end user population. The mobile commerce framework consists of the four basic building blocks as follows:

Content Management

This component deals with the creation, distribution and management of diverse range of media rich digital contents that can be browsed through the small screens of the mobile devices. The digital contents are used in performing various business transactions such as buying and selling of

goods, making online payments, product promos and providing on line customer support. An important part of content management is the ability to track different content providers and maintain and manage the relationships among them. The security and authenticity of the contents must be guaranteed and the access control mechanism must be provided to prevent unwanted users from misusing the document. The content distribution, rights management and clearing financial settlements, all come under the purview of content management module.

Technology Infrastructure

This component deals with the distribution of digital contents and transaction details over wireless communication networks to customer locations or other business installations. The wireless network infrastructure provides the very foundation of mobile commerce framework as it fulfils the basic requirements of data transmission between various business partners while performing any business transaction. The technology infrastructure includes wireless communication technology, Wireless Application Protocol (WAP) and mobile security technology. These technologies need to support digital content distribution, mobile application development and distribution and also provide a secure technological platform for mobile billing and prepaid services through the use of mobile Virtual Private Networks (VPN). Figure 2 depicts the Mobile Commerce Framework.

Application Development

The application development component of mobile commerce framework deals with the diverse range of mobile commerce applications. The main purpose of these mobile applications is to provide the product information to the end users, and also to enable them in performing the mobile business transactions. There are four major categories of mobile applications namely the information applications, communication applications, entertainment applications and commerce applications. Several mobile applications, such as mobile ticketing, mobile banking, mobile advertising, mobile office applications, etc. Fall under these categories. These applications support key business functionalities in respective verticals and are meant to achieve higher revenue generation as well as cost reduction. Sometimes, more than one application are combined together to deliver an aggregated service, which leads to further cost reduction. With the rapid development in various emerging mobile technologies, the application development is going through an evolutional stage. In order to meet the requirements of today's rapidly evolving markets, the mobile applications must be developed in an innovative manner so that it allows the

service provider to quickly address the growing demands of the market and also at the same time offer more profitability and greater cost reduction.

Business Service Infrastructure

The business service infrastructure provides the backbone to the mobile commerce framework. It supports the back office functionalities, such as payment services, location and search facilities and security arrangements of the mobile commerce systems. Production and fulfilment of these services are beyond the scope of traditional telecom service providers. These services are managed and delivered by some outside vendors, who have the ability and experience to provide such functionalities. They maintain the required infrastructure for supporting secured financial transactions in mobile commerce environments and also provide back-end support for searching and other facilities.

Such back office systems are meant to be flexible enough and also are capable of rapid deployment of new services. They have a direct impact on end user experience, and have the greatest influence on the success or failure of the service provider. With the help of such back office infrastructures, mobile service providers can avoid upfront capital IT expenditure, and also these managed services offer the service providers the ability to quickly upgrade to the newer technological environment without any significant investment.
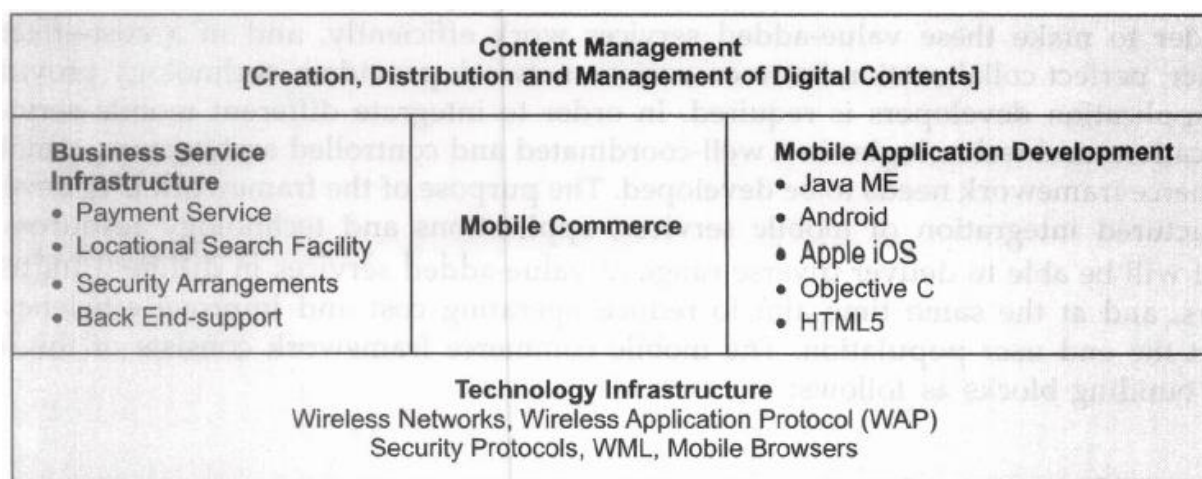

Fig 2 : Mobile Commerce Framework.

Above four components are the four pillars of mobile commerce framework and all m-commerce activities revolve around them. Whenever a mobile user tends to download MP3 music or a latest

movie in his/her mobile device, sends an SMS requesting online payment to a bank, submits online order form requesting purchase in a mobile browser or books a mobile airline ticket, he/she is indulging in either or all four of the above mobile commerce framework components. In order to cope with the dynamic .nature of the modern day lifestyle, people are demanding more mobility in accessing their business applications. A properly integrated and well- coordinated mobile commerce framework needs to be developed in order to provide easy-to-use and secure mobile services to end customers. The main purpose of a structured and balanced mobile commerce framework is to enable the organizations to rapidly adapt to the latest mobile technologies and to ensure customer loyalty by providing them improved and enhanced services in sync with the growing market demands.

7.9   MOBILE COMMERCE BUSINESS MODELS

A business model determines the path or process through which a business organization can realize some profit. It shows the way by which an organization can make some investment, add some value to the investment, get a finished product or service and generate some revenue through sales of the product or service. The revenue generated through sales must exceed the operating cost, so that the company gets some profit. Business models specify the mechanism for generating profit margins and to sustain in the value chain. Thus, business models help managers in strategic planning and formulating overall business strategy of the organization. Electronic commerce has some traditional business models that are widely followed by all major e- commerce vendors worldwide.

These include Merchant model, Broker model, Service Provider model, Advertiser model, etc. Mobile commerce business models differ from those of electronic commerce due to their intrinsic difference in operations and technology. As mobile commerce imparts extra mobility to the users, the business models also reflect the mobility in their nature. The four major services offered by mobile commerce are the payment services, mobile advertisements, mobile shopping and mobile entertainment. Accordingly, mobile commerce business models also revolve around these four applications. The four major mobile commerce business models are described below:

(1) Payment Model

In this model, mobile payment service providers offer mobile payment services that allow users to make cashless payment transactions including banking transactions, share trading, tax/bill

payments and ticket or other retail purchases using credit/debit card or bank PIN. The payment service providers have collaboration with banks (or other financial institutions) and/ or mobile network operators, and accordingly get bank-controlled mobile payment model or operator controlled mobile payment model. The payment service provider charges a certain percentage fee for each payment transaction made through the payment application. Alternatively, the user can pay a nominal monthly subscription fee to the payment service provider and can use the service as and when required

(2) Advertiser Model

This model is an extension of traditional e-commerce advertiser model and provides mobile websites which can be viewed by mobile users in their handheld mobile devices. Advertising companies can display their advertising messages in the website and pay a rental fee to the hosting website for displaying their messages. These mobile advertising websites usually offer some basic services such as email service, search engines, news service or social networking service to the users and post advertising messages in these sites to enjoy greater coverage. The advertisements often come with purchase buttons that allow users to purchase the product directly from their mobile devices. The mobile payment service is also provided to facilitate mobile purchase directly from the advertising websites. The advertiser companies pay a fixed fee to the advertising website for displaying their advertising messages. Additional revenue is generated for each purchase transaction made by the user through the website.

(3) Shopping Model

This model is similar to e-commerce merchant model where retailers create mobile websites to display their range of products to the mobile devices of the customers. The mobile users can browse the mobile websites in their WAP enabled mobile screens and select and purchase any product of their choice. Mobile payment option is also provided in the website so that the users can make mobile payment for the purchased product and complete the deal even while in transit or far away from the actual store location. Thus, shopping model allows retailers to generate additional revenues through mobile shopping and can improve their profit margins.

(4) Content Provider Model

In this model, mobile service providers offer a host of entertainment contents, such as breaking news, weather forecast, traffic updates, music, mobile games, TV shows, video content, movies,

etc. that could be downloaded to user mobile devices. Network operators have tie-ups with various content providers and offer both subscription-based services as well as pay-per-use services to mobile customers. Location-based services, such as map-based navigational services, discount coupons offered in local retail stores or restaurants, news of local events, etc. are also delivered in customer mobile devices. The revenue is generated through subscription fees (for news, traffic/weather updates, movies, and games), usage fees (TV shows, videos, games etc.) or data download fees (for e-mails, e-books, etc.). Various media houses, press agencies or content aggregators follow this model for generating extra revenue through mobile channel.

7.10   M-COMMERCE APPLICATIONS

The main advantage of mobile commerce is that it offers instant connectivity to mobile users even if they are travelling in remote areas and want to communicate in the wee hours of the day. With the help of digital cellular technology and wireless broadband internet access, the mobile user can browse through websites on the screens of their mobile devices and perform business transactions anytime and from anywhere. Customers can place orders as well as pay their bills through their mobile devices while in transit. As the price of mobile phones are decreasing rapidly, number of mobile phone users are increasing in millions and more and more people resort to m-commerce activities.

With the increased use of mobile devices, mobile marketing and advertising have become an effective tool and all big corporations have started their product campaign through mobile devices. In financial sector, mobile banking allows customers to access their bank accounts and pay their bills from their mobile handheld devices. The same handheld device can be used for viewing the latest stock prices and also for conducting share trading. The service plan details of any mobile service, such as mobile phone service can be accessed, mobile bill payment can be achieved and account updates can be viewed through the mobile devices easily and effectively. In information services, delivery of financial news, sports events, weather reports and traffic updates, all can be achieved with a minimal cost and time. In retail industry, customers can place orders for goods/services from their mobile devices on-the-fly. All these applications (see Figure 3) come as the direct consequences of the instant connectivity feature of mobile commerce. The four major products of mobile commerce are as follows:

(1) Mobile Banking

Mobile banking is the process of performing banking transactions such as balance checking, account transfer, bill payments, credit card-based payments, etc. through a mobile device, such as a mobile phone or a Personal Digital Assistant (PDA). Such transactions could be performed from any remote locations and at any time of the day irrespective of the normal working hours of the bank. In order to avail the mobile banking facility, the customer must have an account in the bank, the mobile phone number must be preregistered in the bank and also the network service provider (for the mobile device of the customer) must have a tie-up with the bank. When the customer wants to perform a mobile banking transaction, the transaction request from the customer first goes to the premises of the mobile service provider, and from there it is finally routed to the bank. Depending on the type of transaction, two types of mobile banking are available, namely SMS-banking and WAP-based mobile banking. SMS banking is usually used for non-financial transactions, such as viewing of balance statement, requesting for a cheque book, status checking or stopping a check payment although some banks permit financial transactions also through SMS banking. In SMS banking, an SMS code requesting a transaction is sent to a particular number (as directed by the bank) from the mobile device of the customer. As soon as the bank receives the SMS, the required transaction is performed; the information is retrieved (in case of non-financial transaction) and sent back to the customer mobile phone in the form of another SMS. The entire transaction takes only a few seconds and the cost of the transaction is only that of an SMS. For different types of transactions different SMS codes are used.

In WAP-based mobile banking, the customers are provided with a mobile Personal Identification Number (PIN) by the bank. At the time of performing the transaction, the customer logs on to the WAP website of the bank from the WAP-enabled mobile device. In the bank website, the customer enters the PIN to gain access to the various financial/non-financial transactions of the bank. After the successful verification of the PIN by the bank, the customer is allowed to perform various financial/non-financial transactions, such as transfer of funds from one account to other, payment of bills, credit card-based payments, fixed deposit enquiry, etc. Another facility available in mobile banking is mobile banking alerts. The customers are provided regular alerts whenever a special type of transaction occurs. For example, the customers are alerted whenever credit/ debit crosses a threshold or a check is returned.

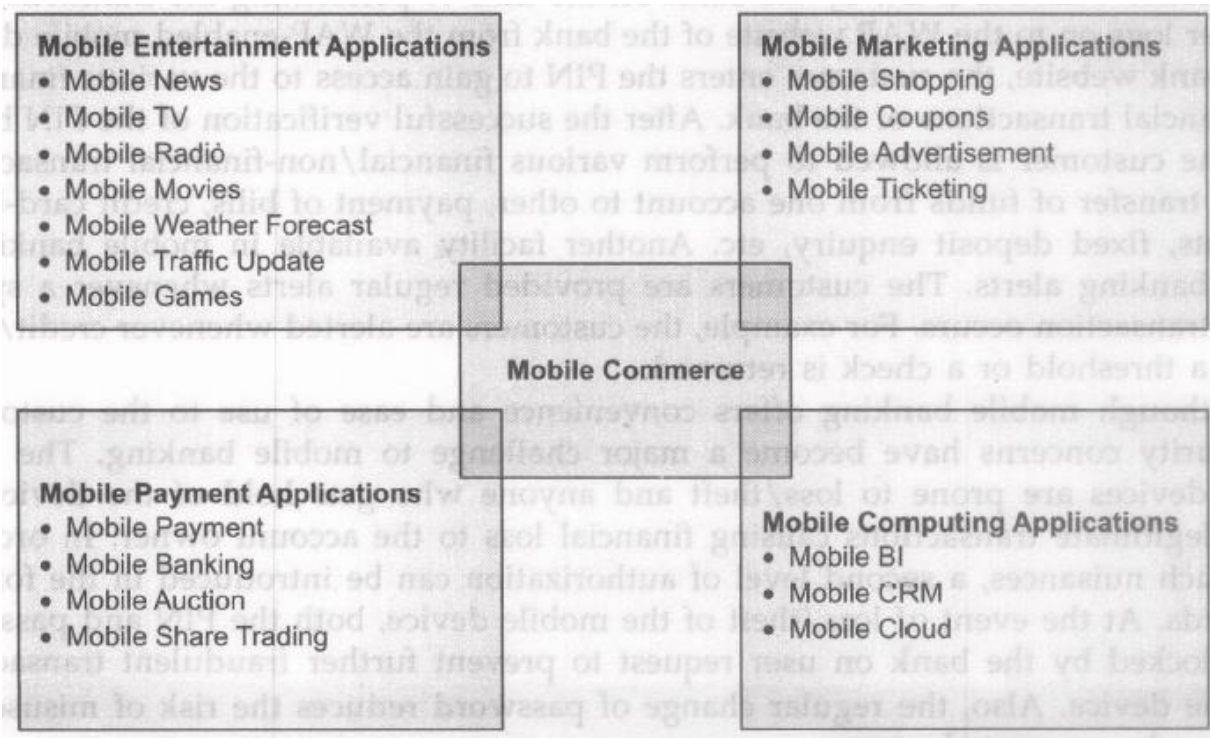|	
Mobile Entertainment Applications • Mobile News • Mobile TV • Mobile Radio • Mobile Movies • Mobile Weather Forecast • Mobile Traffic Update • Mobile Games	**Mobile Marketing Applications** • Mobile Shopping • Mobile Coupons • Mobile Advertisement • Mobile Ticketing
Mobile Commerce	
Mobile Payment Applications • Mobile Payment • Mobile Banking • Mobile Auction • Mobile Share Trading	**Mobile Computing Applications** • Mobile BI • Mobile CRM • Mobile Cloud

Fig 3: Mobile Commerce Applications.

Although mobile banking offers convenience and ease of use to the customers, the security concerns have become a major challenge to mobile banking. The small mobile devices are prone to loss/theft and anyone who gets hold of the device can make illegitimate transactions causing financial loss to the account owner. In order to avoid such nuisances, a second level of authorization can be introduced in the form of passwords. At the event of loss/theft of the mobile device, both the PIN and password can be locked by the bank on user request to prevent further fraudulent transactions using the device. Also, the regular change of password reduces the risk of misuse and tampering by unwanted users.

(2) Mobile Payments

Mobile payment is an alternative payment system where the mobile user makes payment using the mobile device for a wide range of services or goods. Depending on the mode of payments, mobile payments can be broadly classified in the following categories:

Mobile Phone Based Payments:

In this mode, the customer makes payment using the mobile device. In SMS-based payment, the payment is made by sending an SMS to the retailer. Both the customer and the retailer must have a regular credit! Debit account in a partner bank. After selecting an item for purchase, the customer

sends an SMS 'from his/her mobile device to the retailer requesting the purchase. The retailer responds by sending a payment request through SMS to the customer. The customer keys in the bank PIN number to approve the payment. The bank verifies the PIN and the ~mount is automatically debited from the customer bank account to the retailer's account. Both the retailer and the customer get SMS from the bank indicating the details of the transaction and the entire process takes only 10-15 seconds.

In SIM card based payment, the customer uses the mobile phone for purchase of digitized items such as mobile ringtones, MP3 music, video games, wallpapers, etc. that can be' downloaded in the mobile device itself. The purchase amount is added to the monthly mobile bill of the customer. This offers an alternate cashless payment option that does not require use of credit! debit cards or any other online payment service provider, such as PayPal and thus bypass bank and credit card companies altogether. The payment is either debited from the subscriber's pre- paid account or added to the standard post-paid invoice of the subscriber as the case may be.

Card based Mobile Payments

In credit card based mobile payments, the mobile handset is used as a credit card for making payments. The credit card issuing bank gives a PIN number to the mobile handset user. At the time of making payments, the mobile user initiates the transaction by entering the PIN from his/her mobile handset. The issuing bank verifies the PIN and authorizes the payment. Next, the customer enters the amount to be paid and the transaction is completed. The amount is automatically deducted from the credit card account of the mobile user and credited to the bank account of the payee business partner, such as the shop owner.

In smartcard based mobile payments, the SIM (Subscriber Identity Module) card of a mobile handset are equipped with smart card capabilities. Smart cards are plastic cards with embedded integrated circuits. Containing microprocessor and memory to store personal data such as credit card number, PIN, driving license number, etc. The information stored in a smartcard can be read by a card reader in either contact or contact less mode. The SIM card of a mobile device is also a processor card containing programmable memory to store user information for authentication purpose. If the smartcard capabilities are combined with the SIM card of a mobile device, it can be used as a contact less .smartcard, and can be used effectively in making mobile payments.

Mobile phones equipped with contact less smartcards employ Near Field Communication (NFC) technology to exchange data between the mobile device and the nearby smartcard .readers. It

combines the smartcard interface as well as the reader interface in the mobile device so that the mobile device can communicate with the card readers and other NFC devices/mobile phones, At the time of making payments, the mobile phone user waves his/her mobile phone (equipped with contact less smartcard) near a reader module installed in a store or in a public transport system. In order to make the transaction more secure, a PIN is used for authentication purpose, which is automatically supplied by the smartcard. After successful verification of the PIN, the transaction is completed and the payment is automatically deducted from the pre-paid account of the mobile user or charged to the bank account of the user directly. Such NFC-based contact less mobile payment finds wide application in transportation services, toll-tax collection, transit fare collection in mass transit networks, parking fee collection and other unattended POS terminals, where the users can pay with their smartcard enabled mobile phones sitting inside the car while driving.

Mobile Web Payments through WAP

In this mode of mobile payment, the payment is made through the web pages displayed in the micro browser of the mobile phone. The web page is displayed following Wireless Application Protocol (WAP) and associated technology. At the time of making a purchase, the mobile user types the URL of the website of a merchant in the mobile device. The website containing product information is displayed in the micro browser of the mobile handset. The user selects a product that he/she intends to buy and places order for the product through the website. The merchant then sends an invoice to the user. If the user intends to pay through a credit card, he/she enters the credit card number, which is transmitted to the partner bank through a secured channel that employs encryption. The partner bank verifies the credit card number, and if found OK, informs the acquirer bank for making the payment. Alternatively, if the user wants to pay directly from the partner bank in the form of account transfer, he/she enters the PIN number, which is sent to the partner bank for verification. After successful verification of the PIN, the partner bank debits the amount from the user's account and credits to the merchant's account. In either case, an SMS is sent to both the user and the merchant confirming the payment. The entire payment process is simple, quick and user-friendly as they have a similarity to the familiar online payment systems.

Above mobile payment systems are emerging as a potential payment mechanism that ensures fast, smooth and transparent micro payment solutions to mobile users. The mobile phones tend to replace the pocket money and provide a low cost alternative to credit/debit cards for cashless

payments anytime, anywhere and for anything. However, like all other online payment systems, special care should be taken to secure such mobile payments. Stringent security arrangements in the form of encryption and/or password authentication should be adopted to ensure that the financial transaction performed through the mobile device cannot be duplicated, re-used or counterfeited.

(3) Mobile Ticketing

Mobile ticketing is a special application of m-commerce which allows users to purchase tickets for air/rail/bus travel or for any sports/ entertainment events from any location and at any time using mobile phones or any mobile device. The users can avoid tedious and time consuming process of getting paper tickets after waiting in a long line and the organizations can reduce production, distribution and infrastructural cost by providing simpler ways to purchase tickets anytime/anywhere. Mobile tickets are available for a number of cases, such as mass transit tickets, airline check-in, movie/theatre shows, sporting events, consumer voucher distribution, and so on. There are a variety of options by which a user can purchase mobile tickets, such as online purchase from merchant website, from WAP page in the mobile handset, purchase via SMS from the mobile handset, over the phone from a voice call or through a secure mobile ticketing application. Due to the convenience it offers to the customers and cost savings it offers to the companies, mobile ticketing is gaining momentum and more and more people are opting for mobile ticketing. Around 6 million mobile tickets were sold during 2012 worldwide, and the number is expected to increase manifold to cope with the ever increasing demand of the mobile users. At the time of purchasing a mobile ticket, the mobile handset owner logs on to the website of the organization (providing the mobile ticket) and choose "Mobile Ticketing" as the delivery option. Alternatively, the user can log on to WAP page of the organization in the mobile handset. Next, the cell phone number, mobile carrier and cell phone model is entered in the website. In another variation, the request for mobile ticket can be sent through an SMS from the mobile handset to the designated organization. After making online/mobile payment for the ticket, the user receives the mobile ticket in the form of a text message in the phone. The text message includes an image (MMS) with a barcode. At the venue of the event/airport/railway station, the text message with the barcode is produced at the gate. The gate is usually equipped with a barcode reader which after successful verification allows the user to pass through. Alternatively, the alphanumeric number in the barcode can be manually entered in a computer at the gate for verification.

With affordable internet services, decline in handset prices, rapid evolution of secured and easy-to-use mobile applications and convenience of mobile usage, more and more people have started purchasing travel tickets through mobile devices. Realizing the potential of mobile ticketing, almost all major travel portals have launched their mobile ticketing applications for booking purpose. People at the time of making last minute changes to their travel plans find mobile ticketing the only option giving surety and security. In India, Indian Railways (website irctc.com), makemytrip.com, cleartrip.com, yatra.com and many more offer mobile ticketing in their travel offerings. Apart from ticket booking, such travel portals also allow other customer support features, such as cancellation of tickets, tracking refunds on cancelled tickets, and so on. In order to maintain security and integrity of service, special validation techniques have been adopted to avoid reuse of mobile tickets. Such systems employ encryption of barcode data of the mobile ticket, which is decoded at the venue and validated at the centralized server containing ticket database. The mobile ticket once scanned by the barcode reader can never be reused again, thus preventing the fraudulent practice of duplicate tickets.

(4) Mobile Computing

Mobile computing is a technology that allows users to perform normal computing operations, such as internet surfing, document preparation, spread sheeting, preparing PowerPoint presentations, send/receive e-mails or download MP3 audio files using portable computing devices while in transit. The portable computing devices include smart phones, personal digital assistants, laptops, ultra mobile PC or wearable computers. Some of these portable computers have bigger screens compared to mobile phones and hence overcome the small screen limitations. For example, Apple iPad comes with an 8" x 10" screen, which is suitable for reading e-books as well as viewing websites.

In order to communicate with the external world, mobile computing employs wireless communication technology. For wireless internet access, Wi-Fi or Wi-Max technology is used that utilizes radio waves to broadcast internet signal from a wireless router to the surrounding area. Alternatively, digital cellular technology can be employed that utilizes cellular modem in the form of a data card that connects to nearby cell towers for high speed broadband internet access. The data card fits into the PC card slot of the laptop or the notebook computer. Broadband internet access is also provided to cell phones and PDAs using cellular broadband technology.

Mobile computing uses specially developed software that allows users to perform all the

functions that are possible in standard desktop PCs connected under LAN environment. Such software is designed for small-power handheld devices such as Personal Digital Assistants (PDA), enterprise digital assistants or smart phones, and are either pre-loaded in these devices or downloaded by customers from internet. Usually, mobile software is developed by transforming existing software used by computers into software which can be used in any mobile device. Sometimes, new mobile applications are developed for different mobile platforms and programming languages based on the type of mobile device. Different mobile devices use different hardware components, and therefore, the corresponding mobile software needs to be developed using different software architectures and operating systems. Well-known mobile software platforms include Java ME, Symbian OS, Android, Windows mobile, and BREW & Palm OS. Each of these platforms supports a development environment that provides tools to allow software developers write numerous mobile applications in these mobile platforms. Apart from normal e-commerce and m-commerce operations, mobile computing finds wide application in transportation industry, manufacturing and mining industry and distribution industry. In transportation industry, mobile computing is used in exact delivery time tracking, consignment tracking, fleet management information gathering and real-time traffic reporting. Mobile networks are employed. to provide' two-way communication between fleet drivers and their dispatch centres. Real-time passenger information can be obtained from kiosks/bus stops/road signs. In mining industries, portable computers are used in mines for in-process monitoring. In manufacturing industry, portable computers fitted in shop floors help in real time asset management, instant purchase verification, delivery confirmation and order tracking. In hospitality industry, guest check-in can be done using handheld devices, such as PDAs, Blackberry and cellular phones. Portable computers can be employed in sales force automation and mobile POS (Point of Sale) applications. Another service associated with mobile computing is cloud computing that allows mobile users to access application software, databases and shared computing resources, such as server spaces through internet from a mobile computer, The application software such as Microsoft Office, databases etc. reside on a remote server and user can access and use the resource through internet as and when required and pay for .exactly what they use. Thus, the company field representatives can utilize company resources, such as, databases or application software from remote locations through internet accessed in their mobile computers, rather than carrying the company resources with themselves in bulky machines. Mobile computing also provides access to company's

Virtual Private Network (VPN) by tunnelling through the internet. Mobile computing has become an integral part of corporate world. From Gmail to Twitter, Skype to LinkedIn, cloud computing to VPN, it is virtually impossible to do without it just like it is without electricity.

7.11 E-COMMERCE vs. M-COMMERCE

Electronic Commerce (E-Commerce) is the process of conducting business transactions through internet using personal computers or laptops. It employs wired Local Area Networks and cable internet to perform an array of operations, such as online purchase, online payment, online banking, online share trading or online marketing and advertising. People get the freedom of conducting business from their home or making online payments from their offices without travelling to the shop location. However, in order to perform e-commerce transactions, wired internet connectivity as well as personal computers or laptops having internet facility is essential. Thus, in remote areas with limited or no internet facility as well as areas without electricity, e-commerce becomes completely ineffective.

Mobile commerce, on the other hand, allows mobile users to conduct business transactions through their internet enabled mobile devices, such as smartphones, tablets, digital assistants or PDAs. It employs high frequency radio waves for providing wireless internet connectivity and allows mobile users to perform mobile shopping, mobile payments, mobile auctions or mobile ticketing through their mobile devices even when they are out in the field or are travelling. Thus, mobile commerce offers freedom from wired internet connectivity, and supports critical business transactions under completely mobile environment. People can perform share transactions, make tax or bill payments or perform fund transfers through mobile banking, even if they are travelling in remote areas far from their home or office. In other words, mobile commerce aptly fits into the extremely mobile lifestyle of modern day business executives and has become an integral part of daily lives of billions of mobile users.

Table 1: Comparison of E-commerce and M-commerce

Factors	E-commerce	M-commerce
Mobility	E-commerce employs wired networks for internet connectivity and hence is restricted inside a building. It offers anytime connectivity.	M-commerce employs high frequency wireless networks for providing wireless internet and is completely ubiquitous in nature. It offers anytime anywhere connectivity.
Reliability	Wired networks are more reliable and suffer less interference and noise. Quality of data transmitted is better as there is little or no cross-talk.	Wireless networks suffer from interference from adjacent channel frequencies or reflected waves that tend to reduce the intensity and quality of transmission. Special error detection techniques are employed to eliminate errors in transmission and improve signal quality.
Speed	The transmission speed of wired networks are much higher (of the	The transmission speed of modern wireless networks are usually of the order of 100 Mbps.

Difference between E-commerce and M-commerce

The fundamental difference of e-commerce and in-commerce lies on the fact that the former uses wired networks and the latter uses wireless networks for internet connectivity. Although wired networks require cumbersome cabling and switching operations to provide connectivity to each and every computer and other peripheral devices, they offer better performance and better speed as compared to the wireless networks. A wired network can offer data rate of the order of 1000 Mbps, whereas a wireless network usually offers data rate of the order of 100 Mbps. A wired network is much more secure than wireless networks, as it is much more difficult to gain access to the internal wired network inside a protected building without breaking in. On the other hand, it is much easier to break the security barrier of a wireless network and gain access to private and confidential data stored (or in transit) inside the wireless network. Proper security arrangements in the form of encryption are employed in order to make wireless networks as secure as their wired counterparts. The comparison between e-commerce and m-commerce is given in Table 1.

In spite of above disadvantages, mobile commerce is fast becoming the preferred choice of numerous mobile users for making online transactions during travel or while outside the range of conventional wired networks in their home or office buildings. They prefer to watch their favourite TV shows, play online games, connect with friends through mobile social networking

sites or purchase train/bus/event tickets, while travelling inside a bus or while waiting inside an airport. The ubiquitous nature of mobile devices adds extra mobility to the mobile users worldwide, and as a result there is an exponential growth in the mobile online transactions across all industry sectors and verticals.

7.12   E-GOVERNANCE

The terms government and governance have been widely disputed. Saxena (2005) draws a key distinction between 'government' and 'governance'. He identifies the government as an institution, whereas governance may be seen as a wider concept illustrating forms of governance that can be undertaken not only by government authority but by private firms, non-governmental organization or associations of firms.

Governments are specific institutions that donate to governance. In other words, it is suggested that governance focuses on the approach in which decisions are made, while government focuses on the approach in which these decisions are carried out.

The Government of India views E-Governance as a strategic tool for transforming Governance and improving the quality of services provided by the government to its people. India's experience in E-Governance has demonstrated significant success in improving accessibility, cutting down costs, reducing corruption, extending help and increased access to un-served groups. In this phase of experimentation, many e-initiatives have reached millions of people belonging to these sections of society. Improved access to information and services has provided economic and social development opportunities, facilitated participation and communication in policy and decision-making processes and empowerment of the weakest groups. This has led to fostering a sense of ownership and building of social capital, which in turn, constitute a basis for local revitalization.

The Government of India, in various forums, has indicated its commitment to provide efficient and transparent government to all strata of society. E-Governance is now mainly seen as a key element of the country's governance and administrative reform agenda. The Government of India aspires to provide:

- Governance that is easily understood by and accountable to the citizens, open to democratic involvement and scrutiny (an open and transparent government)

- Citizen-centric governance that will cover all of its services and respect everyone as individuals by providing personalized services.

- An effective government that delivers maximum value for taxpayers' money (quick and efficient services)

7.13   E-GOVERNMENT

E-Government is not simply a matter of giving government officials computers or automating old practices. Neither the use of computers nor the automation of complex procedures can bring about greater effectiveness in government or promote civic participation. Focusing solely on technological solutions will not change the mentality of bureaucrats who view the citizen as neither a customer of government nor a participant in decision-making.

Understood correctly, e-Government utilizes technology to accomplish reform by fostering transparency, eliminating distance and other divides, and empowering people to participate in the political processes that affect their lives.

Governments have different strategies to build e-government. Some have created comprehensive long-term plans. Others have opted to identify just a few key areas as the focus of early projects. In all cases, however, the countries identified as most successful have begun with smaller projects in phases on which to build a structure.

To assist policymakers in devising their own plans and initiatives, this handbook divides the process of e- government implementation into three phases. These phases are not dependent on each other, nor need one phase be completed before another can begin, but conceptually they offer three ways to think about the goals of e-government. The three phases are Publish, Interact and Transact.

Government to SMART Government

The one line translation of SMART Governance is in fact is very true in meaning. I want to illustrate every word in my thoughts as under:

Simple: When hierarchy of governing people is simple and is fit in the eyes of people for whom result of governance is meant, than only it is meaningful.

Moral: Governing people should be high in moral values. It is only inner moral value that inspire individual to do a justified job, which is essential for people looking towards them for justice.

Accountable: As per management principle accountability is more with more authority/power. Hence people sitting on every stage concerned with governance should give direction with feeling of accountability towards the result of action.

Responsive: People appointed for governing others have to responsive in action. Their action should be immediate and at the time of need, because something denied at the time of need is useless, if later given. It wipes the faith of people.

Transparency: Transparency is like a mirror in administration which always shows other the good and bad point, needs to be clarified or appreciated which are otherwise hidden in nature.

In continuation to above one more thing I would like to add is that it should be innovative in nature of good to very good and very good to outstanding and outstanding to super.

7.14   E-GOVERNANCE: DEFINITION

'E-Government' or e-Governance is defined as 'The utilization of the Internet and the world-wide-web for delivering government information and services to the citizens.' (United Nations, 2006; AOEMA, 2005),

'Electronic Governance' essentially refers to the approach 'How government utilized IT, ICT, and other web-based telecommunication technologies to improve and/or enhance on the efficiency and effectiveness of service delivery in the public sector.' Like when you are using ATM facility of a Bank to collect cash anytime from anywhere or you are using on line fund transfer facility of an Indian bank is an application of e-Governance.

One more definition of e-Governance is "the use of information and communication technologies, and particularly the internet, as a tool to achieve better government". In this description, the internet is defined as a requirement and a possible medium for e-Governance.

7.15   FOUR STAGES OF E-GOVERNMENT

E-Government is a relatively new term that has emerged over the past several years. As governments all over the country have been making the commitment to E-Government, certain patterns have developed that reflect the stages of evolution:

Phase 1: Presence

This first stage of E-Government development is characterized by the existence of a presence on the Internet. During this first phase, the Internet sites are rather static in nature and are only meant to provide general information.

Phase 2: Interaction

This second stage of e-Government development is characterized by Internet sites that provide search capabilities, host forms to download, and provide links to other relevant sites. In most instances, this stage enables the public to access critical information online, but requires a visit to a government office in order to complete the task.

Phase 3: Transaction

This third stage of e-Government development is characterized by empowering the public to conduct and complete entire tasks online. The focus of this stage is to build self-service applications for the public to access online. This is the stage where Oakland County is currently.

Phase 4: Transformation

The fourth stage of e-Government development is characterized by redefining the delivery of governmental information and services. This phase relies on robust customer relationship management (CRM) tools, wireless access devices and new methods of alternative service delivery capabilities that reshape relationships between citizens, businesses, employees and governments.

7.16   IMPORTANCE OF E-GOVERNMENT

The importance of e-government is closely inter-related with importance of good government in country. We can see that good government as in exercise of administrative, political and economic authority to manage affair and transaction of country in each and every level. The main importance of e-government is to support and simplify e-governance for all parties, government, citizen and business. Following are some points which make clearer about E-government objective and importance.

- Better delivery of government services to citizens
- Improved interactions with businesses, industries, and citizen empowerment through access of information and Communication Technology.
- Supporting economic growth and poverty reduction through improved access to ICTs.

- Strengthening tenets of good governance – efficiency, transparency, accountability, and inclusiveness
- 365 days * 24 Hours fulfilling changed expectations of citizens –They expect the service from government as they get from private business.
- 365 days * 24 Hours Generating information and knowledge in line with socio-economic dynamism.
- 365 days * 24 Hours Ensuring citizen centricity (also extended to include businesses) and service orientation (amidst changing level of expectations at par with private sector entities)

7.17 NATIONAL E-GOVERNANCE PLAN

The National E-Governance Plan of Indian Government seeks to lay the foundation and provide the impetus for long-term growth of e-Governance within the country. The plan seeks to create the right governance and institutional mechanisms, set up the core infrastructure and policies and implements a number of Mission Mode Projects at the centre, state and integrated service levels to create a citizen-centric and business-centric environment for governance.

The National e-Governance Plan (NeGP), takes a holistic view of e-Governance initiatives across the country, integrating them into a collective vision, a shared cause. Around this idea, a massive countrywide infrastructure reaching down to the remotest of villages is evolving, and large-scale digitization of records is taking place to enable easy, reliable access over the internet. The ultimate objective is to bring public services closer home to citizens, as articulated in the Vision Statement of NeGP.

"Make all Government services accessible to the common man in his locality, through common service delivery outlets, and ensure efficiency, transparency, and reliability of such services at affordable costs to realise the basic needs of the common man"

The Government approved the National e-Governance Plan (NeGP), comprising of 27 Mission Mode Projects (MMPs) and 8 components, on May 18, 2006. The Government has accorded approval to the vision, approach, strategy, key components, implementation methodology, and management structure for NeGP. However, the approval of NeGP does not constitute financial approval(s) for all the Mission Mode Projects (MMPs) and components under it. The existing or on-going projects in the MMP category, being implemented by various Central Ministries, States,

and State Departments would be suitably augmented and enhanced to align with the objectives of NeGP.

7.18 MISSION MODE PROJECTS AND THEIR IMPLEMENTATION STATUS

NeGP comprises of 27 Mission Mode Projects (MMPs) encompassing 10 Central MMPs, 10 State MMPs and 7 Integrated MMPs spanning multiple Ministries/ Departments. "Mission Mode" implies that the objective and the scope of the project are clearly defined, that the project has measurable outcomes and service-levels, and the project has well-defined milestones and timelines for implementation.

MMPs are owned and spearheaded by various Line Ministries concerned for Central, State, and Integrated MMPs. The concerned Ministry/ Department is entirely responsible for all decisions related to their MMPs. However, decisions impacting NeGP as a whole are taken in consultation with DIT. Additionally, wherever required by the concerned Ministries/ Departments, DIT provides necessary support for project formulation and development.

Every State has the flexibility of identifying up to 5 additional State-specific MMPs (relevant for economic development within the State). In cases where Central Assistance is required, such inclusions are considered on the advice of the concerned Line Ministries/ Departments.

Central MMPs
- Banking
- Central Excise & Customs
- Income Tax (IT)
- Insurance
- MCA21
- National Citizen Database
- Passport
- Immigration, Visa and Foreigners Registration& Tracking
- Pension
- E-Office

State MMPs
- Agriculture

- Commercial Taxes
- e−District
- Employment Exchange
- Land Records
- Municipalities
- Gram Panchayats
- Police
- Road Transport
- Treasuries

Integrated MMPs

- CSC
- E-Biz
- E-Courts
- E-Procurement
- EDI For e-Trade
- National e-governance Service Delivery Gateway
- India Portal

7.18.1 Central MMPs

Banking

Evolution of core banking technology in India has brought in the convenience of "anytime, anywhere banking" to Indian customers. There is now a movement towards integration of core banking solutions of various banks, which is expected to bring in operational efficiency and reduce the time and effort involved in handling and settling transactions, thereby improving customer service and facilitating regulatory compliance.

The Banking MMP covers the following services:

- Electronic Central Registry under Sarfaesi Act, 2002
- One India One Account-for Public Sector Banks
- Electronic Mass Payment System

Central Excise & Customs

The Central Board for Excise and Customs (CBEC) is implementing this MMP with a view to facilitate trade and industry by streamlining and simplifying customs and excise processes, and to create a climate for voluntary compliance.

The project aims to network 20,000 users in 245 cities using wide area network, and equip taxpayers with up-to-date information relating to Customs, Central Excise, Service Tax Laws, etc. over the internet.

Some of the services proposed to be covered in this MMP are:

•   Simplification of registration, returns, revenue reconciliation and exports procedures

•   Movement towards integration of goods and service taxation

•   e-Registration for excise and service tax

•   e-Filing of returns and refunds

•   Integration of e-filing with system driven, risk-based scrutiny

•   Export facilitation through linkages between Excise and Customs

•   Improved dispute resolution mechanism

•   Monitoring of arrears and their recovery

•   Central Excise Revenue reconciliation

Income Tax (IT)

The Income Tax Department of India is implementing a plan for setting up a comprehensive service that enables citizens to transact all businesses with the Department on an anywhere, anytime basis.

Some of the services proposed to be covered under the Income Tax MMP are:

•   Allocation of Permanent Account Number (PAN)

•   Tax accounting

•   Taxpayer grievance redressal

•   Taxpayer correspondence

•   Tax compliance

•   Online submission of returns

•   Processing of tax return

•   Processing of tax-deducted-at-source (TDS) return

Insurance

This MMP has been conceived with a view improve services for customers in the General Insurance sector. The MMP aims to:

- Facilitate customer service through education, information, speedy processing of claims and online issuance of policies on web

- Provide automated grievance reporting and redressal facility to customers

- Create and enlarge business opportunities

- Create holistic database of insurance users

- Integrate insurance database(s) with other government database(s) to analyse social security aspects and facilitate service delivery

The project is proposed to be implemented through the four PSU Insurance companies.

MCA21

The Ministry of Corporate Affairs (MCA), Government of India, has initiated the MCA21 project, which enables easy and secure access to MCA services in an assisted manner for corporate entities, professionals, and general public. The MCA21project is designed to fully automate all processes related to enforcement and compliance of the legal requirements under the Companies Act, 1956. The project further seeks to achieve inter-operability with the National e-Governance Services Delivery Gateway (NSDG), which will help extend MCA services to businesses via multiple front-end delivery channels, and which will also help provide other value-added services over and above the base services offered by MCA21.

National Citizen Database

Project UID, a Planning Commission initiative, proposes to

- Create a central database of residents, initially of those above the age of 18 years

- Generate a unique identification number (UID) for all such residents

The UID is intended to provide a robust basis for efficient delivery of various social and welfare services to persons below the poverty line (BPL). It can also be used as the basis for identifying and authenticating a person's entitlement to government services and benefits through a single system rather than all government departments individually and independently investing in creating infrastructure, systems and procedures for verifying entitlement of residents under various

schemes of the Government. To this end, the project envisages provision of linking of existing databases, as well as providing for future additions, by the user agencies.

Passport

The Passport Seva Project was launched by the Ministry of External Affairs with the objective of delivering Passport Services to the citizens in a comfortable environment with wider accessibility and reliability. The project envisages setting up of 77 Passport Seva Kendras (PSKs) across the country, a Data Centre and Disaster Recovery Centre, Call centre operating 18x7 in 17 languages, and a centralized nationwide computerized system for issuance of passports. The entire operation will function in a "less paper" environment with an attempt being made to deliver passports within 3 working days to categories not requiring police verification.

Immigration, Visa and Foreigner's Registration & Tracking (IVFRT)

In order to Modernize and upgrade the Immigration services, "Immigration, Visa and Foreigners Registration & Tracking (IVFRT)" has been identified and included as one of the MMPs to be undertaken by the Ministry of Home Affairs under the National e-Governance Plan (NeGP). The core objective of this Project is to develop and implement a secure and integrated service delivery framework that facilitates legitimate travellers while strengthening security. The scope of the project includes 169 Missions, 77 ICPs (Immigration Check Posts), 5 FRROs (Foreigners Regional Registration Offices), and FROs (Foreigners Registration Offices) in the State/District Headquarters.

The implementation of this MMP will enable authentication of traveller's identity at the Missions, Immigration Check Posts (ICPs) and Foreigners Registration Offices (FROs) through use of intelligent document scanners and biometrics, updation of foreigner's details at entry and exit points, improved tracking of foreigner's through sharing of information captured during visa issuance at Missions, during immigration check at ICPs, and during registration at FRRO/ FROs.

Pension

Under this MMP, a Pensioner's Portal http://pensionersportal.gov.in has been set up with the following components:

- Non-interactive component to provide updated information on pension issues
- Interactive component to monitor grievance redressal at three interlinked levels, as follows:
    o Central-level in Department of Pensions &Pensioners' Welfare (nodal point)

- o   Central Ministries/ Department-level
- o   Pensioners' Associations-level (field level)

Pensioners registering grievances on the portal get unique access codes, which helps them monitor progress of their cases. The designated nodal officer at the level of Department of Pension & Pensioners' Welfare and at the level of Central Ministry/ Department can also monitor the progress of such registered cases.

E-Office

The Government of India, in recognition of the long-felt need for efficiency in government processes and service delivery mechanisms, has included e-Office as a core mission mode project (MMP) under the National e-Governance Plan (NeGP). It is estimated that this MMP has the potential of targeting over 2 lakh users.

This MMP aims at significantly improving the operational efficiency of the Government by transitioning to a "Less Paper Office".

The objectives of the MMP are:

- To improve efficiency, consistency and effectiveness of government responses
- To reduce turnaround time and to meet the demands of the citizens charter
- To provide for effective resource management to improve the quality of administration
- To reduce processing delays
- To establish transparency and accountability

7.18.2 State MMPs

Agriculture

There have been several initiatives by State and Central Governments to meet the various challenges facing the agriculture sector in the country. The Agriculture MMP has been included in NeGP in an effort to consolidate the various learning from the past, integrate all the diverse and disparate efforts currently underway, and upscale them to cover the entire country.

The MMP is to be operationalized by Department of Agriculture and Cooperation (DAC), and aims to provide services, such as:

- Information to farmers on seeds, fertilizers, pesticides
- Information to farmers on Govt. Schemes

- Information to farmers on Soil recommendations
- Information on crop management
- Information on weather and marketing of agriculture produce

Commercial Taxes

There has been a strong demand for streamlining VAT administration through citizen-centric, service- oriented processes, and establishing a certain degree of standardization with respect to Commercial Tax (CT) administration. Since the CT departments mainly interface with businesses and often account for 60−70 per cent of the total revenue of the States and Union Territories (UTs), their functioning can directly affect the attractiveness of a State or UT as a business destination. It is against this backdrop that the Commercial Taxes MMP was conceived. The initiative is spearheaded by the Department of Revenue (DoR), Ministry of Finance, with strategic consultancy provided by the National Institute for Smart Government (NISG) and Ernst & Young (E &Y).

Under this MMP, various recommendations have been made to facilitate simplification of administrative procedures and reduction of processing timelines. Some of the key recommendations are noted below:

- Electronic filing of returns
- Electronic clearance of refunds
- Electronic payment of tax
- Online dealer ledger
- Online issuance of CST statutory forms through Tax Information Exchange System (TINXSYS)
- Facility to dealer to obtain various online information services

E-District

Districts are the de facto front-end of government where most Government-to-Consumer or G2C interaction takes place. The e-District project was conceptualized to improve this experience and enhance the efficiencies of the various Departments at the district-level to enable seamless service delivery to the citizen.

Front-ends under the scheme, in the form of citizen facilitation centers, are envisioned to be built at District-, Tehsil-, Sub-division- and Block- levels. Village-level front-ends would be established

through Common Services Centres (CSCs) for delivery of services. Indicative services planned to be delivered through this MMP include:

- Certificates: Creation and distribution of certificates for income, domicile, caste, Birth, Death etc.

- Licences: Arms Licenses etc.

- Public Distribution System (PDS): Issue of Ration Card, etc.

- Social Welfare Schemes: Disbursement of old-age pensions, family pensions, widow pensions, etc.

- Complaints: Related to unfair prices, absentee teachers, non-availability of doctor, etc.

- RTI: Online filing and receipt of information relating to the Right to Information Act

- Linking with other e government projects: Registration, Land Records, and Driving Licences, etc.

- Information Dissemination: About government schemes, entitlements, etc.

- Assessment of taxes: Property tax, and other government taxes.

- Utility Payment: Payments relating to electricity, water bills property taxes etc.

Employment Exchange

Ministry of Labour & Employment is in the process of conceptualizing this MMP. It is expected that the MMP will help match the requirements of employers against employee database. It is also expected that the MMP will have mechanisms to provide valuable guidance and career counselling to the unemployed, and facilitate online registration of vacancies by employers.

Land Records

Maintenance of land records and the availability of easily accessible land information is one of the most important issues facing governance today. "Land Records" itself is a generic expression and can include records such as, the register of lands, Records of Rights (RoRs), tenancy and crop inspection register, mutation register, disputed cases register, etc. It can also include geological information regarding the shape, size, soil-type of the land; and economic information related to irrigation and crops

The Land Records MMP, being implemented by Ministry of Rural Development (MoRD), seeks to accomplish the following across States:

- Completion of all data entry related to digitization of land records

- Provision of legal sanctity to computerized Records-of-Rights (RoRs)

- Stopping further issue of manual RORs

- Setting up computer centers at Tehsils

- Enabling Web access

The main objectives of the MMP are:

- To facilitate easy maintenance and updates in land databases

- To provide for comprehensive scrutiny to make land records tamper-proof (in an effort to reduce the menace of litigation and social conflicts associated with land disputes)

- To provide the required support for implementation of development programmes for which data about distribution of land holdings is vital

- To facilitate detailed planning for infrastructural as well as environment development

- To facilitate preparation of an annual set of records in the mechanised process, thereby producing accurate documents for recording details such as collection of land revenue, cropping pattern, etc.

- To facilitate a variety of standard and ad-hoc queries on land data

- To provide database for agricultural census

Core Services offered under the Land Records MMP are:

- Issue of copies of RoRs

- Crop, irrigation and soil details

- Filing and tracking of status of mutation cases

- Availability and submission of forms

Municipalities

The Municipalities MMP aims to leverage ICT for sustained improvement in efficiency and effectiveness of delivery of municipal service to citizens. The key objectives of the MMP are:

- To provide single window services to citizens on anytime, anywhere basis

- To increase the efficiency and productivity of Urban Local Bodies (ULBs)

- To develop a single, integrated view of ULB information system across all ULBs in the State

- To provide timely and reliable management information relating to municipal administration for effective decision-making
- To adopt a standards-based approach to enable integration with other related applications
- This MMP is one with significant citizen interaction, given that municipalities provide a large number of basic services for millions of citizen living in urban centres across the Nation.

Panchayats

The Panchayat represents the first-level of Government interaction for over 60 per cent of the Indian populace, and provides a large number of basic services for millions of citizens living in rural locations across the Nation. It is against this backdrop that the Panchayat MMP has been included in NeGP. The MMP aims to address and overcome the typical challenges faced in the villages, such as lack of reliable communication infrastructure, delay in delivery of services to citizens, low revenue mobilization for implementing schemes at the Gram Panchayat level, and lack of monitoring mechanisms for schemes.

The MMP envisages implementation of various modules across the services and management functions within Gram Panchayat, such as the following:

- Issue of trade licences and NoC
- House-related services
- Issue of certificates of Birth and Death, Income and Solvency
- Dissemination of internal process of Panchayat agenda, voting, and resolution
- Copy of proceedings of Gram Sabha and Action Taken Report (ATR)
- Receipt of funds / progress report
- Dissemination of BPL data

Police

This MMP has been included in NeGP in light of the ever-increasing threats of terror attacks and of continually ascending crime graphs. It includes aspects such as creation of- and sharing of- crime-related databases across departments, effective personal management, and efficient inventory control.

Given the large variations in these functions across States, the MMP professes a phased approach towards implementation. The first phase broadly targets those functions that are common across States and which are driven by the Criminal Procedure Code (CrPC).

Road Transport

The Road Transport MMP was included in NeGP with a view to create a unified data schema which could be used by all States and Union Territories to computerize their respective transport offices (for faster and better-managed issue of vehicle registration certificates and driving licences). This MMP is being implemented as part of the Horizontal Transfer Programme of DIT.

Treasuries

Due to non-computerization or part-computerization of State Treasuries, most of the operational information continues to be exchanged in paper form. A Core Group on Computerization of Treasuries in State has been constituted to formulate a draft scheme on the Treasuries MMP under NeGP. The detailed concept note is being worked out by the Department of Expenditure.

7.18.3 Integrated MMPs

Common Services Centers

The CSC is a strategic cornerstone of the National e-Governance Plan (NeGP), as part of its commitment in the National Common Minimum Programme to introduce e-governance on a massive scale. The CSCs would provide high quality and cost-effective video, voice and data content and services, in the areas of e-governance, education, health, telemedicine, entertainment as well as other private services. A highlight of the CSCs is that it will offer web-enabled e-governance services in rural areas, including application forms, certificates, and utility payments such as electricity, telephone and water bills.

The Scheme creates a conducive environment for the private sector and NGOs to play an active role in implementation of the CSC Scheme, thereby becoming a partner of the government in the development of rural India. The PPP model of the CSC scheme envisages a 3-tier structure consisting of the CSC operator (called Village Level Entrepreneur or VLE) the Service Centre Agency (SCA), that will be responsible for a division of 500-1000 CSCs and a State Designated Agency (SDA) identified by the State Government responsible for managing the implementation over the entire State.

The CSC Scheme has been approved by Government in September 2006 with an outlay of Rs. 5742 Crores over a period of 4 years. It is expected that 100% CSCs would be rolled by March 2011.

E-BIZ

The eBiz initiative, being piloted by the Department of Industrial Policy and Promotion, seeks to provide comprehensive Government-to-Business (G2B) services to business entities with transparency, speed, and certainty. It aims at reducing the points of contact between business entities and Government agencies, standardizing "requirement information", establishing single-window services, and reducing the burden of compliance, thereby benefitting stakeholders such as entrepreneurs, industries and businesses, industry associations, regulatory agencies, industrial promotional agencies, banks and financial institutions, and taxation authorities.

E-Courts

The Indian judiciary comprises of nearly 15,000 courts situated in approximately 2,500 court complexes throughout the country. Under the e-Courts MMP, it is proposed to implement ICT in Indian judiciary in 3 phases over a period of 5 years. The MMP aims to develop, deliver, install, and implement automated decision-making and decision-support systems in 700 courts across Delhi, Bombay, Kolkata and Chennai; 900 courts across 29 State/ Union Territory capitals; and 13,000 district and subordinate courts across the Nation.

The objectives of the project are:
- To help judicial administration in streamlining their day-to-day activities
- To assist judicial administration in reducing the pendency of cases
- To provide transparency of information to the litigants
- To provide judges with easy access to legal and judicial databases

E-Procurement

This MMP aims at making government procurement simplified, transparent, and result-oriented. It is being implemented through the Directorate General of Supplies & Disposals (DGS&D), a central purchasing organization under the Ministry of Commerce and Industry, which has core competency in procurement of goods and services.

The objectives of the MMP are:
- To establish a one stop-shop for all services related to government procurement

- To reduce cycle time and cost of procurement

- To enhance transparency in government procurement

- To enhance efficiency of procurement

- To bring about procurement reform across the government

The e-Procurement MMP will cover all aspects of procurement from indent of tender to tender preparation, bidding, bid evaluation and award of contract. In light of the CVC mandate that all Departments publish their tenders on the internet, the MMP will deploy extensive security features for encryption and decryption of bids, and digital signatures.

NSDG

The National e-Governance Plan (NeGP) of the Govt. of India aims to cooperate, collaborate and integrate information across different departments in the Centre, States and Local Government. Government systems are characterized by islands of legacy systems using heterogeneous platforms and technologies and spread across diverse geographical locations, in varying state of automation, make this task very challenging.

The National e-Governance Service Delivery Gateway (NSDG), an integrated MMP under the National e- Governance Plan (NeGP), can simplify the above task by acting as a standards-based messaging switch and providing seamless interoperability and exchange of data across the departments. NSDG acting as a nerve centre, would handle large number of transactions and would help in tracking and time stamping all transactions of the Government.

7.19 NEED OF E-GOVERNANCE

The strategic need of e-Governance is to support and simplify governance for all parties' government, citizens and businesses. The use of ICTs can connect all three parties and support processes and activities. In other words, in e-Governance uses electronic means to support and stimulate good governance. Therefore the objectives of e-Governance are similar to the objectives of good governance. Good governance can be seen as an exercise of economic, political, and administrative authority to better manage affairs of a country at all levels, national and local. It is useful here to present objectives for e-democracy and e-government. The two main objectives of e- democracy are:

- To provide citizens access to information and knowledge about the political process, about services and about choices available

- To make possible the transition from passive information access to active citizen participation by:
  - Informing the citizen
  - Representing the citizen
  - Encouraging the citizen to vote
  - Consulting the citizen
  - Involving the citizen

Regarding e-government, the distinction is made between the objectives for internally focused processes (operations) and objectives for externally focused services.

External strategic objectives

The external objective of e -Governance is to satisfactorily fulfill the public's needs and expectations on the front office side, by simplifying their interaction with various online services. The use of ICTs in government operations facilitates speedy, transparent, accountable, efficient and effective interaction with the public, citizens, business and other agencies.

Internal strategic objectives

In the back-office, the objective of e-Governance in government operations is to facilitate a speedy, transparent, accountable, efficient and effective process for performing government administration activities. Significant cost savings (per transaction) in government operations can be the result. It can be concluded that e-Governance is more than just a Government website on the Internet. Political, social, economic and technological aspects determine e- Governance.

7.20 E-GOVERNANCE EXPERIENCES IN INDIA

Recognizing that e-Governance shall be a major part of e-initiatives and shall play an increasingly important role in modern Governance, various agencies of the Government and civil society organizations have taken a large number of e-initiatives across the country. Indicated below are some of the key e- initiatives taken in the country across some of the important citizen/business related departments:

Customs and Excise (Government of India)
- 98% of export and 90-95% of import documentation computerized
- Electronic filing through ICEGATE at 3 locations (Mumbai, Delhi, Chennai)

- 80% of Service Tax returns electronically processed

- Anywhere to Anywhere reservation from Anywhere

- Electronic Booking of tickets on select sectors

- Online Information on Railway reservation on Internet

Postal Department (Government of India)

- Direct e-credit of Monthly Income Scheme returns into the investors accounts

- Dematerialization of Savings Certificate (NSC) and Vikas Patras (KVP), offering full portability

Passport / Visa (Government of India)

- 100% passport information computerized

- All 33 Regional Passport Offices covered

- Machine readable passports at some locations

AP Online (State Government of Andhra Pradesh)

An Integrated Citizen Services Portal providing citizen centric services such as: Birth/Death Certificates, Property Registration, Driver's License, Govt. Applications & Forms, Payment of taxes / utility bills etc.

Bhoomi

Automation of Land Records (State Government of Karnataka) it provides computerized Record of Rights Tenancy & Crops (RTC) - needed by farmer to obtain bank loans, settle land disputes etc. It has also ensured increased transparency and reliability, significant reduction in corruption, exploitation and oppression of farmers. This project has benefited 20 million rural land records covering 6.7 million farmers.

CARD – Registration Project (State Government of Andhra Pradesh)

Computerization Administration of Registration Department (CARD) impacting 10 million citizens over a period of 3 years. It has completed registration of 2.8 million titles with title searches made in 1.4 million cases. The system ensures transparency in valuation of property and efficient document management system. The estimated saving of 70 million man-hours of citizen time valued at US$ 35 mil (investment in CARD - US$ 6million). Similar initiatives in other states

like SARITA (State Government of Maharashtra) STAR (State Government of Tamil Nadu), etc. have further built upon this initiative.

Gyandoot: Intranet in Tribal District of Dhar (State Government of Madhya Pradesh)

This project offers e-Governance services including online registration of applications, rural e-mail facility, village auction site etc. It also provides services such as Information on Mandi (farm products market) rates, On-line public grievance redressal, caste & income certificates and Rural Market (Gaon ka Bazaar).

LOKMITRA (State Government of Himachal Pradesh)

- Offers e-Governance services:
- Online registration of applications,
- Rural e-mail facility, village auction site etc.
- Key services provided to citizens
- Information on Mandi (farm products market) rates
- On-line public grievance redressal
- Sending and receiving information regarding land records, income certificates, caste certificates and other official documents.
- Market rates of vegetables, fruits and other items

e-Mitra - Integrated Citizen Services Center (State Government of Rajasthan)

- Implemented using a PPP (Public Private Partnership) model
- Private partner paid by the government department / agency
- G2C services like:
  o Payment of electricity, water, telephone bills o Payment of taxes
  o Ticket Reservations
  o Filing of Passport applications o Registration of birth/death
  o Payment by cash/cheque/ credit card

The above cases of e-initiatives are only illustrative. Many of the State Governments have successfully implemented several such e-initiatives. This has positively impacted the quality of life of citizens. Hence e- Governance as a major e-initiative affords an excellent opportunity for India to radically improve the quality of governance and thereby:

- Allow for two-way communication between government and citizens not only for service delivery but also to receive opinions of citizens on policies and government performance
- Provide greater access to excluded groups, who have few opportunities to interact with government and benefit from its services and schemes
- Include all sections of the society in the mainstream of development
- Enabling rural and traditionally marginalized segments of the population to gain fast and convenient access to services in their own neighbourhoods.

7.21 SUMMARY

M-Commerce is the process of performing business transactions using handheld mobile devices which are connected through wireless networks. The business transactions may range from buying and selling goods, making mobile payments, downloading audio/video contents, playing online games, using numerous software applications or getting mobile tickets. The mobile devices include cellular phones, handheld computers such as palmtops or laptops, pagers, smartphones and Personal Digital Assistants (PDA). Mobile commerce provides instant connectivity between mobile users irrespective of their geographical location and time of the day. With enormous growth of wireless and mobile technology and rapid penetration of mobile phones in developing countries worldwide, the scope of m-commerce has increased manifold.

7.22 KEYWORDS

M-Commerce: M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets.

PDA: A Personal Digital Assistant (PDA) is a small device that can include computing, telephone/fax, paging, networking, and other features. It is typically used as a personal organizer.

WAP: Wireless application protocol (WAP) is a communications protocol that is used for wireless data access through most mobile wireless networks

VPN: A virtual private network (VPN) is a technology that creates a safe and encrypted connection over a less secure network, such as the internet.

E-Government: E-government (short for electronic government) is the use of technological communications devices, such as computers and the Internet to provide public services to citizens and other persons in a country or region.

NeGP: The National e-Governance Plan (NeGP) is an initiative of the Government of India to make all government services available to the citizens of India via electronic media. MMPs-Mission Mode Projects

MCA: The Ministry of Corporate Affairs is an Indian government ministry. It is primarily concerned with administration of the Companies Act 2013, the Companies Act 1956, the Limited Liability Partnership Act, 2008 & other allied Acts and rules & regulations framed there-under mainly for regulating the functioning of the corporate sector in accordance with law

7.23 Self-assessment Tests

(a) Student Activities

1. Define mobile commerce. Describe how business transactions are performed through mobile devices.
2. What is mobile payment? Describe SMS-based transactional payment.
3. What is a cell site in a cellular network? What are the components of a cell site?
4. What are the benefits of mobile commerce? Describe in detail.
5. Describe the limitations of mobile commerce and suggest possible remedies.
6. Describe the features of mobile banking. What are the security challenges of mobile banking?
7. What are the various categories of mobile payment? Describe card-based mobile payment.
8. Describe mobile ticketing process. What are the challenges faced by mobile ticketing?
9. Define the term e-Governance and its applications for a normal user.
10. Do you think e-Governance will help the citizen to collect and contact with government services in future is yes then write your views?
11. What are the basic requirements to start with e-Governance?
12. For a normal user what will be the difficulties to access e-Governance services?

13. Study National e-Governance Plan from NEGP website and write about some pilot projects of e- Governance

14. Find our 10 Mission mode projects websites and write a note about them.

15. Explain the benefits of e-Governance for a common man also describe the barriers to avail those services.

(b) Learning Activities

1. _____ is the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets.

2. _____ is a communications protocol that is used for wireless data access through most mobile wireless networks.

3. A _____ is a technology that creates a safe and encrypted connection over a less secure network, such as the internet.

4. The _____ is an initiative of the Government of India to make all government services available to the citizens of India via electronic media.

5. The utilization of the Internet and the world-wide-web for delivering government information and services to the citizens is known as _____.

(c) Feedback of learning activities

Answers of learning activities:

1. M-commerce

2. Wireless application protocol

3. virtual private network

4. National e-Governance Plan

5. E-Government

7.24 Study Tips

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