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E- COMMERCE

SEMESTER - IV

COMMERCE

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COURSE INTRODUCTION

The course *E- Commerce* of B. Com 4th semester will focus on the different aspects of electronic commerce. In the days of proliferation of ICT, e- commerce has become an integral part of the society. The revolutionary process of commerce has attained a new stage with the advent of electronic mode of commerce. The speed and ease of doing business over internet has really made a new world which is full of opportunities as well as the challenges. Keeping these in mind, the course *E- Commerce* has been developed for the learners of B. Com. Programme. Learners will come to know about the different aspects of e- commerce and will be able to analysis the application of internet in the field of commerce. The course covers various aspects of e- commerce like the various emerging e- commerce business organisation, planning for online business, technology for online business, application of e- commerce in retail, wholesale ans services sector, security in e- commerce, cyber crimes etc.

While going through a unit, you will notice that some along-side boxes, which have been included to help you know some of the difficult, unseen terms. Some ‘‘ACTIVITY’’ (s) has been included to help you to apply your own thoughts. Again, we have included some relevant concepts in ‘‘LET US KNOW’’ along with the text. At the end of sections, you will get ‘‘CHECK YOUR PROGRESS’’ questions. These have been designed to self-check your progress of study. It will be better if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with ‘‘ANSWERS TO CHECK YOUR PROGRESS’’ given at the end of each unit.

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UNIT 1: INTRODUCTION TO E- COMMERCE

UNIT STRUCTURE

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1.1 LEARNING OBJECTIVES

After going through this unit, you will be able to

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

1.2 INTRODUCTION

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

1.3 MEANING OF E-COMMERCE

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

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

E-commerce can be defined from various perspectives as:

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

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

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

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

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

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



CHECK YOUR PROGRESS

Q.1 : Define E-commerce.

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1.4 NATURE OF E-COMMERCE

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

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



CUSTOMISATION:
Producing or modifying something to suit individual customer need.

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

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

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

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

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

1.5 TYPES OF E-COMMERCE

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

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

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

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

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

1.5.1 Business to Customer E-Commerce

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

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

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

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

1.5.2 Customer to Customer E-Commerce

Customer to customer e-commerce (C2C e-commerce) is one in which two individuals wants to sell/buy items. The items are usually used items, collector's items such as stamps, coins or antiques. The seller posts the description of the item and the expected price of the item on a web site maintained by a company which acts as a broker. An individual who logs on to this site looking for items may be

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

1.5.3 Business to Business E-Commerce

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

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

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

Using e-commerce enabled business applications, companies are able to better control their supplier costs by reducing PO (purchase

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

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

1.5.4 Business to Government (B2G)

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

CHECK YOUR PROGRESS

Q.2 : Define C2C e- commerce.

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1.6 COMPARISON BETWEEN TRADITIONAL COMMERCE AND E-COMMERCE

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

1.7 ADVANTAGES AND DISADVANTAGES OF E-COMMERCE

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

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

- Your purchases are delivered directly to your home or office
- Unlimited choices

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

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

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

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

5. A large number of potential business partners can be quickly found and contacted by searching the World Wide Web.
6. Certain types of goods can be customized and sold directly by a manufacturer or assembler eliminating middleman. For example, Dell Computers sells PCs directly to customers configuring them as per individual's requirements. Middlemen such as distributors and retailers are eliminated. Supply chain management is improved as manufacturers can adjust their inventory level of items and order processing based on customer orders in hand and customer preferences gathered over a period of time.
7. The cost of setting up an E-Commerce site is quite small compared to the cost of having large premises.
8. The cost of transactions is quite low. It is estimated that transaction costs are less than fifth of that of traditional business.
9. There are some items such as airline tickets where competing airlines provide several special packages and prices. Quick comparison is possible on the World Wide Web and a confirmed booking obtained on-line. For airlines also it is an easy method of attracting a large clientele without expensive promotional expense.
10. Companies can maintain on-line e-catalogue of items and a price list which can be quickly updated. This is much cheaper than printing and distributing catalogues and price lists. Electronic versions can be changed quickly when new items are added/ deleted.
11. Customers can be serviced on-line expeditiously.
12. There are industries such as automobile manufacturers where a large number of ancillary units produce subsystems such as horns, brake linings, tyres, lights, etc. E-shopping to get the best deals and delivery has now become very common in B2B commerce. Intermediaries also provide auction sites which allow expeditious price negotiation. This allows lowering of costs and so called just-in-time manufacturing.

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

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

10. If there is a sudden increase in orders, there may be logistical problems in physically delivering items to customers. Long delays in receiving ordered goods will adversely affect future sales. Being prepared to handle seasonal surge in demand requires pre-planning.

11. When a successful e-business is launched, immediately there will be many copy cats who will attempt to duplicate it. Duplication is much simpler in e-commerce compared to traditional business as it is easy to quickly build a web site and start a competitive business. Thus to maintain the advantage of being first with the idea requires continuous innovation and improvement.

12. On-line businesses expose their catalogues and price lists to competitors. The advantage of secrecy of traditional mode of doing business is lost.

13. Not every item is suitable for sale in the web. For example saris, fancy furniture, etc., which require touch and feel are unsuitable for sale through the web.

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



CHECK YOUR PROGRESS

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

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

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1.8 REASONS FOR TRANSACTING ON- LINE

SCOPE OF E-COMMERCE:

The scope of e-commerce is very wide. It connects the management of the enterprises to the various aspects of trading viz, suppliers, distributors,

retailers, consumers and well other traders on the global e-commerce infrastructure. The enterprise provides product development, conferencing, accounting financial planning, logistics etc. through e-commerce. Other concerned areas are-

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

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

REASON FOR TRANSACTING ON-LINE:

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

Some of the main reasons are stated below -

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

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

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

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

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

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

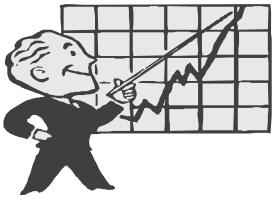
Ability to do business 24 hours: The biggest advantages of online shops are that they are open for 24 hours a day and seven days in a week.

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

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

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

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



CHECK YOUR PROGRESS

Q.5 : Discuss two reasons for transacting online.

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1.9 CATEGORIES OF E-COMMERCE

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

Electronic Markets

Electronic Data Interchange

Internet Commerce

1.9.1 Electronic Markets

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

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

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

The electronic market is, in effect, a platform that bring together the suppliers and customers in a specific market segment.

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

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

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

1.9.2 Electronic Data Interchange (EDI)

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

EDI can be used for Pre-sales transactions; there have been EDI messages developed for transactions such as contract but they are widely implemented. Finding an appropriate trading partner and negotiating conditions of trade is likely to be undertaken by a member of staff in the buying department (or a manager on the golf course). The Pre-Sales phase could also involve the use of an electronic market, or an open access network such as the internet.

The Benefits of EDI

EDI can bring a number of advantages to the organizations that use it. It should save considerable time on the exchange of

business transactions and has the potential for considerable savings in costs.

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

1.9.3 Internet Commerce

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

Internet e- Commerce

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

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

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

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

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



CHECK YOUR PROGRESS

Q.6 : Define EDI.

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1.10 LET US SUM UP

In this unit we have discussed the following aspects:

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



1.11 FURTHER READING

1. Electronic commerce, A manager's guide - Ravi Kalkota and Andrew B. Whinston, Pearson Education.

2. E-Commerce, Strategy, Technologies and Applications - David Whiteley, Tata Megraw-hill.

1.12 ANSWERS TO CHECK YOUR PROGRESS

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

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

Ans to Q3 :

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

ii. Unlimited choices

Ans to Q4 :

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

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

Ans to Q5 :

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

small and mid-size companies will be the main growth force of e-commerce in coming years.

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

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



1.13 MODEL QUESTIONS

Q.1. Define E-commerce.

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

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

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

Q.5. Define EDI.

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UNIT 2: EDI

UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 Importance of EDI

2.4 Types of Business Data Transfer System

2.5 Electronic Interchange

- 2.5.1 Definition
- 2.5.2 Types
- 2.5.3 User group of EDI
- 2.5.4 Importance of EDI
- 2.5.5 EDI in India

2.6 Let Us Sum Up

2.7 Further Reading

2.7 Answer to Check Your Progress

2.8 Model Question

2.1 LEARNING OBJECTIVES

After going through this unit you will be able to:

- define EDI
- discuss the types of EDI
- explain the User group of EDI
- explain the importance of EDI
- EDI in India

2.2 INTRODUCTION

EDI (Electronic Data Interchange) is the computer-to-computer exchange of business information using a public standard. EDI is a central part of electronic commerce because it enables businesses to exchange

information electronically much faster, more cheaply and more accurately than is possible using a paper-based system.

EDI was first used in the transportation industry more than 20 years ago. Ocean, motor, air, rail carrier, and the associated shippers, brokers, customs, freight forwarders, and bankers put EDI into practice. The first set of EDI standards were developed by the Transportation Data Coordinating Committee (TDCC). ANSI (American National Standards Institute) X 12 standards (Electronic numbers and formats) were developed later and based upon the TDCC format.

EDI is widely used in these industries: manufacturing, shipping, warehousing, utilities, pharmaceuticals, construction, petroleum, food processing, and healthcare. A recent study has projected that the number of companies using EDI will quadruple in the next six years. About 50,000 private sector companies in the United States, like Federal Express, Eastman Kodak, American Airlines, Nike, Staples, Nationsbank, JC Penney, and others currently use EDI.

2.3 IMPORTANCE OF EDI

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

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

To gain these advantages EDI has to be seen as an investment - there are costs upfront and the payback is longer term. The cost is the set up of the EDI system (hardware, software and network) and the time required

to establish agreements with trading partners. The savings only start when there is a significant volume of business transacted using EDI, a point that is called the 'critical mass' in the jargon of EDI.

2.4 TYPES OF BUSINESS DATA TRANSFER SYSTEM

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

The Internet by itself remained the preserve of academic institutions for several years until its commercial potential was understood. This led to the emergence of a number of Internet Service Providers (called ISPs) who provide value-added services to their customers using the Internet infrastructure. The general public was thus able to use the Internet and the number of Internet users increased by leaps and bounce all over the world particularly with improved communication infrastructure. This spawned a number of innovations in business between commercial organizations and commercial organizations and between individuals. These transactions are commonly known as Business to Business (B2B), Business to Customer (B2C) and Customer to Customer (C2C). Another new entrant is Government to Business (G2B) in which individuals and business organizations can transact business with the government using the Internet. Business transactions include orders sent to vendors to supply items, invoices sent by vendors, payments made by credit cards, payments through electronic funds transfer and cash payments made using what is known as electronic cash. The important point is that all transactions are carried out electronically using the network infrastructure. There are a variety of e-commerce applications. Some of these are as follows:

- Retail sales of goods such as books, CDs, toys, etc.
- Auction sites using which an individual buyer and seller can buy and sell goods.

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

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

2.5 ELECTRONIC INTERCHANGE

Electronic Data Interchange (EDI) is used by organizations for transactions that occur on a regular basis to a pre-determined format.

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

EDI can be used for Pre-sales transactions; there have been EDI messages developed for transactions such as contract but they are not

widely implemented. Finding an appropriate trading partner and negotiating conditions of trade is likely to be undertaken by a member of staff in the buying department (or a manager on the golf course). The Pre-Sales phase could also involve the use of an electronic market.

2.5.1 Definition

EDI is often summed up as Paperless Trading. More formally EDI is defined, by the International Data Exchange Association (IDEA), as:

'The transfer of structured data, by agreed message standards, from one computer system to another, by electronic means.'

This definition of EDI has four elements, each of them essential to an EDI system:

1. **Structured data:**

   EDI transactions are composed of codes, values and (if necessary) short pieces of text; each element with a strictly defined purpose. For example, an order has codes for the customer and product and values such as quantity ordered.

2. **Agreed Message Standards:**

   The EDI transaction has to have a standard format. The standard is not just agreed between the trading partners but is a general standard agreed at national or international level. A Purchase Order will be one of a number of agreed message standards.

3. **From One Computer System To Another:**

   The EDI message sent is between two computer applications. There is no requirement for people to read the message or re-key it into a computer system it into a computer system. For example, the message is directly between the customer's Purchasing System and the supplier's Order Processing System.

4. By Electronic Means:

Usually this is by data communications but the physical transfer of magnetic tape or floppy disc would be within the definition of EDI. Often networks specifically designed for EDI will be used.

There are many further definitions of EDI; most of them include the same four points. The definition presented by Sokol (1989) is one further example:

'the INTER-COMPANY COMPUTER-TO-COMPUTER communication of STANDARD BUSINESS TRANSACTIONS in a STANDARD FORMAT that permits the receiver to perform the intended transaction.'

The definition emphasizes the point that the normal application of EDI is in business transactions between companies but, contrary to this definition, there are also applications of EDI for information exchange and for intra-company transactions.

2.5.2 Types

There are many different types of EDI and a range of approaches to enabling EDI across a trading community. Whether looking at EDI for the first time or expanding an existing EDI infrastructure to support a variety of business partners across the globe, there is a method of utilizing EDI that will suit your business needs, technical capabilities and budget.

Types of EDI are -

1) Direct EDI/point -to-point
2) EDI via VAN/EDI network
3) EDI via AS2
4) EDI via FTP/VPN, SFTP, FTPS
5) Web EDI
6) Mobile EDI
7) EDI outsourcing
8) EDI software.

2.5.3 User group of EDI

Businesses, government agencies, and other organizations use EDI for a vast range of transactions. The classic application of EDI is in purchasing. A manufacturer or a retail store might use EDI with its suppliers to replace paper purchase orders, material releases, shipping notices, and invoices.

At a simple level, the objective of EDI is to replace paper. The creation, shuffling and storage of paper is cumbersome and expensive. By eliminating paper, EDI allows information to be exchanged between trading partners more rapidly, more efficiently, and with far fewer errors.

But to fully understand what is driving EDI, one must see EDI in the context of a bigger picture. Companies employ EDI as part of broad management strategies, like just-in-time manufacturing and quick response retailing. The goal of these strategies is often to reduce inventory stocks and to allow companies to be more responsive to changes in market demand. A buyer company (manufacturer or retailer) prefers to order product from suppliers only as and when it is needed, and it prefers that the product arrive quickly after the order is placed. This strategy calls for the buyer to send suppliers many more order messages than was necessary in the past, each message covering a smaller quantity of product. Instead of ordering 200 widgets every month, the buyer may begin ordering 10 widgets every business day.

EDI allows managers to be creative in the exchange of data between companies. Managers may seek to re-engineer the business process to simplify it. One example of this is known as evaluated receipt settlement (ERS), a strategy that seeks to eliminate the exchange of an invoice between a manufacturer and its supplier. Under ERS, when a buyer purchases a particular product from the seller, the two companies exchange a series of

ordering and shipping messages. Once the product arrives, the buyer has enough information to calculate the amount of money the buyer owes the seller for the product. Thus, the buyer does not want an invoice; the buyer just calculates and pays. The sending and processing of an invoice would be a redundant step in the process.

Another idea emerging from EDI is vendor managed inventory (VMI). Before VMI, a buyer such as a retailer would analyze its sales, and based on its analysis place orders for new inventory. Under VMI, the responsibility for analyzing sales and for deciding when the buyer will receive new product shifts to the seller. The buyer sends raw sales data in electronic form to seller. Seller then makes judgments as to which products are more likely to sell in the future and decides which products to send. This shift in responsibility changes the allocation of risks and responsibilities between buyer and seller.

In short, EDI can be used by different sectors of activity like industry, commerce, banks, insurance, transport, customs, etc. Furthermore, trading partners from all these sectors can be linked through an EDI system. Let us see the applications of EDI in different sectors:

1. **Industry/Commerce**

   EDI presents a lot of applications in industry and commerce. The main applications are:

   -bid, order, contract

   -delivery, shipment order

   -invoice, payment

   Bid, order, contract: A customer who wants to buy a product or a service can ask one or more suppliers to submit a bid. The call for a bid can include technical specifications of the product, quantity, data and means of delivery etc. The supplier can answer

with a bid specifying all the details of the transaction like price, payment arrangement, shipment arrangements etc. The procedure can be repeated till the two parties agree and result to a contract.

Delivery, shipment order: When the products are ready to be delivered the supplier transmits internally the delivery order and the shipment order to the transport company.

Invoice, payment: After the delivery of products, the supplier sends the invoice with all the details of the transaction: product, services, quantity, price, payment arrangement etc. The payment can be also done through EDI with a payment order. Supplementary documents concerning the account can be transmitted. The benefit of EDI is its speed and accuracy.

2. **Bank/Insurance**

Banking environment: EDI is used in banking environment from the very beginning (late 50s). Banks world-wide are transmitting millions of EDI messages with international payment orders, currency exchange arrangements, credits and debits etc.

Insurance : Recently EDI is used by the insurance industry. Various projects are connecting insurance companies, which are exchanging information about clients, car insurance etc.

3. **Transport/Customs**

Transport: There are EDI projects in road, rail, sea and air transport as well as in logistics and storage companies. Transport and logistics companies can be linked between them and also with export companies, banks, customs etc. Transport companies are trading though EDI with their customers exchanging delivery orders, shipment details, invoices, payments etc.

Customs: When there is a transnational exchange, customs must be informed by the importer/exporter about the

transportation of goods. Importers/exporters can transmit EDI messages instead of filling the form concerning all the details of the transportation. Customs process the data and send a notification with the fees to be paid. The payment of the fees can be done also through EDI.

Organizations that use EDI

EDI has potential applications in any organization where the administration processes are computerized and that exchanges regular and standardized transactions with other organizations. Extensive users of EDI include:

- **Bhs**

  Bhs is a UK and European multiple retailer dealing mainly in apparel (fashion) goods. It operates some 120 large retail outlets and is represented in most major UK shopping centres.

  Bhs deals with about 400 suppliers on a regular basis and all orders for merchandise are sent by EDI. Using just-in-time supply it is important for Bhs to know what the suppliers have in stock and for the supplier to be able to anticipate demand by seeing Bhs sales data; this two way flow of information is also maintained using EDI. In addition to the orders, EDI is used to confirm supplier delivery and to communicate bar code information for use in delivery and packaging.

  The use of EDI at Bhs is the back-end to an integrated merchandising, sales and replenishment system. Replenishment decisions are dependent on the sales plan and the stock available (updated from the EPOS systems). New EDI orders can be generated overnight and be with the supplier the next day. Bhs calculate that they can be making 4.5 million replenishment decisions each working week.

- **Tele Ordering**

  The EDI system for the book trade is called TeleOrdering, a system that is linked to the Whitaker's catalogue Books in Print.

The book trade has a number of methods of supply. Some bookshops deal with the representatives of the major publishers and some with wholesale book suppliers but, for the academic bookshop, the Whitaker's catalogue is a standard tool.

Books in Print is a monthly catalogue issued on CD-ROM. It allows the bookshop to look up any book that is in print but not in stock. If the customer then wants the book ordering the system will format an EDI order that is sent via TeleOrdering to the appropriate publisher. The system is flexible and readily copes with the various types and sizes of organizations in the book trade. Smiths, for example, have incorporated Whitakers into their own warehouse. At the other end of the scale, the small publisher that does not have an online connection to the system will receive a printed version of the EDI order, from TeleOrdering, in the post.

A good supply chain is important to both the virtual as well as the physical bookshop. Online bookshops must ensure that orders are satisfied as rapidly as possible and Blackwells, for example, have made a point of linking their online bookshop to TeleOrdering so that efficient supply can be assured.

2.5.4 Importance of EDI

The direct advantages of EDI include:

- **Shortened Ordering Time:**

Paper orders have to be printed, enveloped and sent out by the customer's post room, passed through the postal service, received by the supplier's post room and input to the supplier's order processing system. To achieve all this, reliably, in less than three days would be to do very well. EDI orders are sent straight into the network and the only delay is how often the supplier retrieves messages from the system. Orders can be

in the supplier's system within a day, or if there is urgency the messages can be retrieved more frequently, for example every hour.

- **Cost Cutting:**

  The use of EDI can cut costs. These include the costs of stationery and postage but these will probably be fully matched by the costs of running the EDI service. The principle saving from the use of EDI is the potential to save staff costs. The obvious example of this is that if the orders are directly input to the system there is no need for an order entry clerk. Note also that seasonal peaks, staff holidays, etc. no longer create a backlog in the order entry area. The cost savings need to be offset against the system development and network costs.

- **Elimination of Errors:**

  Keying any information into a computer system is a source of errors and keying paper orders into the order processing system is no exception. EDI eliminates this source of errors. On the down side, there is no order entry clerk who might have spotted errors made by the customer- the customer will get what the customer asked for.

- **Fast Response:**

  With paper orders it would be several days before the customer was informed of any supply difficulty, such as the product is out of stock. With EDI the customer can be informed straightaway giving time for an alternative product to be ordered or an alternative supplier to be used.

- **Accurate Invoicing:**

  Just like orders, invoices can be sent electronically. EDI invoices have similar advantages to EDI orders in saved time and avoided errors. However, the major advantage in EDI invoices is that they can be automatically matched against the original order

and cleared for payment without the sort of queries that arise when paper invoices are matched to orders.

- **EDI Payment:**

  Payment can also be made by EDI. The EDI payment system can also generate an EDI payment advice that can be electronically matched against the relevant invoices, again avoiding query and delay.

Indirect advantages of the use of EDI can be:

- **Reduced Stock Holding:**

  The ability to order regularly and quickly reduces the amount of goods that need to be kept in a store room or warehouse at the shop or the factory. For many JIT manufacture and quick response supply systems stockholding is eliminated altogether with goods being delivered only as they are needed. Reduced stock holding cuts the cost of warehousing, the double handling goods (into store and then out again onto the factory or shop) and the capital requirement to pay for the goods that are just sitting in store.

- **Cash Flow:**

  Speeding up the trade cycle by getting invoice out quickly, and directly matched to the corresponding orders and deliveries, can and should speed up payments and hence improve cash flow. Elimination of most invoice queries can be particularly significant in reducing delays in payments.

- **Business Opportunities:**

  There is a steady increase in the number of customers, particularly large, powerful customers, that will only trade with suppliers that do business via EDI. Supermarkets and vehicle assemblers are prime examples. Being ready and able to trade electronically can be an advantage when competing for new business.

- **Customer Lock-in:**

  An established EDI system should be of considerable advantage to both customer and supplier. Switching to a new supplier requires that the electronic trading system and trading relationship be redeveloped, a problem to be avoided if a switch of supplier is not essential.

To gain these advantages EDI has to be seen as an investment - there are costs upfront and the payback is longer term. The cost is the set up of the EDI system

with trading partners. The savings only start when there is a significant volume of business transacted using EDI, a point that is called the 'critical mass' in the jargon of EDI.

2.5.5 EDI in India

The potential for e-commerce is enormous in India. owing to the rapid growth of the number of Internet users. The enormous savings in time and money achieved by both buyers and seller is the principal advantage.

Indian Readiness for E-commerce-

A pertinent question arises here about the readiness of Indian buyers for e-commerce. The proliferation of the Net at a rapid pace and the granting of private ISP (Internet Service Provider) licenses has put the market en route to a new phase. Even small and medium enterprises (SMEs) have been increasingly realizing the potential of the net.

The technological advancements happening in all spheres of life in India will be the driving factors for the spread of e-commerce in this country, as has happened elsewhere in the world. NASSCOM (National Association of Software and Service Companies), has recently released the findings of its survey to evaluate the e-commerce scenario in India. E-commerce is dependent to a great

extent, on the number of internet users in India. The following tables give the rate of growth of internet users in India.

The Internet and India

The internet has undergone a steady evolution from being a source of instant communication in the early 90s to a rich source of infotainment and education. This evolution has been driven by the growing customer expectations with the content of Internet. Thus newer segments of Internet usage have emerged and there lie potential user segments that are still unexplored and many emerge in the future.

Fifteen years ago there was limited Internet access but only in a few major cities, all in the hands of the government. VSNL, the agency responsible for Internet activities, and the DOT (Department of Telecommunications) provided an agonizingly erratic connectivity, with miserly bandwidth and far too few phone lines. Connection rates ran as low as 5% and users were frequently cut off. And the rates for this pathetic level of service were among the highest in the world. By the end of 1998, after three years of government monopoly, there were barely 150,000 Internet connections in India.

Presently, the government monopoly is largely over. Dozens of small to large Internet Service Providers have set up shop, triggering a price war and an improvement of service.

Thus, if e-commerce based businesses can emerge as viable propositions working within the confines of the existing not-so-conducive framework, imagine the potential that would be unleashed once we have a suitable frame work in place. With the passing of I.T. Bills in both Houses of Parliament, a legal regulatory structure exists and what is now required is effective enforcement.

According to the NASSCOM survey, considering the interest the Government is taking in the growth of the market, e-commerce in India will witness a significant jump over the years. Based on

these preliminary findings, experts have concluded that the penetration of the Internet and e-commerce transactions in India will increase by leaps and bounds. The survey findings also point to the fact that India's active Internet population would spend close to 3.2 percent of its total regular household spending through Internet purchase.

Revenue streams will increasingly be aligned with the emerging global model, it is being anticipated. This would mean that the major part of the revenues would come from transactions, while a smaller amount would be realized from advertising. It is expected that by 2003, more than 75 percent of the revenues of Internet business to consumer businesses would come from transactions. The advertisement revenues would amount to about 8 percent of the total ad spent by the companies. Analysts also believe that one of every four Non Resident Indians would make some form of purchase from India based sites.

E-commerce Opportunities for Industries

Following are some of the areas where e-commerce is witnessing rapid growth in the global markets. Indian software and services companies need to tap into some of these vertical segments to gain the maximum advantage in the e-commerce solution sector.

1. Financial services- A large number of users use the Internet for some form of financial guidance.
2. Stock trading -Online stock trading is nowadays one of the most demanding e-commerce utilities. The ability to offer market access at a competitive price is a key advantage of online stock broking companies and this is slowly happening in India too.
3. Banking- Internet banking is now growing. Many banks like ICICI and HDFC are making inroads into this area.
4. Legal and professional services - Opportunities also exist for Indian companies in legal other professional services. There

are significant legal and regulatory implications of implementing an Internet business or of migrating from a traditional off- line business. In terms of opportunities for Indian legal service providers, the requirement for professional, legal and regulatory advice is expected to increase as the number of E-commerce users increases.

5. Tour and travel - The travel industry has readily adapted to e-commerce. There has been a growing emphasis on the search for alternative distribution channels within the sector, particularly with the railways and the airlines, as they seek to reduce costs. These sectors have adapted well because of their online reservation systems.

6. Healthcare - Healthcare represents one of the biggest expenditures of governments worldwide. The Internet has the potential to enhance communications, streamline processes and create new business opportunities, by providing high-quality administrative services and integrating information systems.



CHECK YOUR PROGRESS

Q.1 : Define EDI .

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Q.2 : What are the advantage of EDI ?

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Q.3 : Explain the business data transfer system .

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Q.4 : Who are the user group of EDI ?

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2.6 LET US SUM UP

In this unit we have discuss the following -

- EDI
- Types of EDI
- Advantage of EDI
- Disadvantage of EDI
- User group of EDI
- Importance of EDI
- EDI in India



2.7 FURTHER READING

1. Electronic commerce, A manager's guide - Ravi Kalkota and Andrew B. Whinston, Pearson Education.
2. E-Commerce, Strategy, Technologies and Applications - David Whiteley, Tata Megraw-hill.
3. E-commerce and its Applications, - US Pandy, Rahul Srivastava, Saurabh Shukla, S. Chand & Company Ltd.

2.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: 'The transfer of structured data, by agreed message standards, from one computer system to another, by electronic means.'

Ans to Q2: The direct advantages of EDI include

- **Shortened Ordering Time:**
  Paper orders have to be printed, enveloped and sent out by the customer's post room, passed through the postal service, received by the supplier's post room and input to the supplier's order processing system.
- Cost Cutting:
  The use of EDI can cut costs. These include the costs of stationery and postage but these will probably be fully matched by the costs of running the EDI service.
- **Elimination of Errors:**
  Keying any information into a computer system is a source of errors and keying paper orders into the order processing system is no exception. EDI eliminates this source of errors
- **Fast Response:**
  With paper orders it would be several days before the customer was informed of any supply difficulty, such as the product is out of stock. With EDI the customer can be informed straightaway giving time for an alternative product to be ordered or an alternative supplier to be used.
- **Accurate Invoicing:**
  Just like orders, invoices can be sent electronically.
- **EDI Payment:**
  Payment can also be made by EDI. The EDI payment system can also generate an EDI payment advice that can be electronically matched against the relevant invoices, again avoiding query and delay.

Indirect advantages of the use of EDI can be:

- Reduced Stock Holding:
- Cash Flow:
- Business Opportunities:
- Customer Lock-in:

Ans to Q3: The telecommunication system used in e-commerce is the Internet which connects computers all over the world which can communicate with one another using well-defined rules (called a standard protocol).

The Internet by itself remained the preserve of academic institutions for several years until its commercial potential was understood. This led to the emergence of a number of Internet Service Providers (called ISPs) who provide value-added services to their customers using the Internet infrastructure. The general public was thus able to use the Internet and the number of Internet users increased by leaps and bounds all over the world particularly with improved communication infrastructure. This spawned a number of innovations in business between commercial organizations and commercial organizations and between individuals. These transactions are commonly known as Business to Business (B2B), Business to Customer (B2C) and Customer to Customer (C2C). Another new entrant is Government to Business (G2B) in which individuals and business organizations can transact business with the government using the Internet. Business transactions include orders sent to vendors to supply items, invoices sent by vendors, payments made by credit cards, payments through electronic funds transfer and cash payments made using what is known as electronic cash. The important point is that all transactions are carried out electronically using the network infrastructure.

Ans to Q4: Businesses, government agencies, and other organizations use EDI for a vast range of transactions. The classic application of EDI is in purchasing. A manufacturer or a retail store might use EDI with its suppliers to replace paper purchase orders, material releases, shipping notices, and invoices.

At a simple level, the objective of EDI is to replace paper. The creation, shuffling and storage of paper is cumbersome and expensive. By eliminating paper, EDI allows information to be exchanged between trading partners more rapidly, more efficiently, and with far fewer errors.



2.9 MODEL QUESTIONS

Q.1. Write short note on EDI in India .

Q.2. what are the disadvantage of EDI ?

Q.3. What are the types of EDI ?

Q.4. Explain the importance of EDI.

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UNIT 3: E-BUSINESS

UNIT STRUCTURE

3.1 Learning objectives

3.2 Introduction

3.3 Internet Book Shops

3.4 Grocery Supplies

3.5 Software Supplies and Support

3.6 Electronic Newspapers

3.7 Internet Banking

3.8 Virtual Auctions

3.9 Online Share Dealing

3.10 Gambling on the Net

3.11 Web Booking System

3.12 Let Us Sum Up

3.13 Further Reading

3.14 Answers to Check Your Progress

3.15 Model Questions

3.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

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

3.2 INTRODUCTION

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

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

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

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

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

An e-shop may be set up by:

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

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

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

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

3.3 INTERNET BOOK SHOPS

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

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

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

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

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

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

Some large online bookshop sites are:

www.amazon.com

www.barnsandnoble.com

www.bol.com

www.bookshop.blackwell.co.uk



CHECK YOUR PROGRESS

Q 1: What is meant by Internet Book shops?

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3.4 GROCERY SUPPLIES

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

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

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

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

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

www.peapod.com

www.homestore.com

www.sainsbury.co.uk

www.tesco.net

3.5 SOFTWARE SUPPLIES AND SUPPORT

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

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

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

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

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

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



CHECK YOUR PROGRESS

Q 2: Explain software supplies and support.

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3.6 ELECTRONIC NEWSPAPERS

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

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

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

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

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

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

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

3.7 INTERNET BANKING

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

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

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



CHECK YOUR PROGRESS

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

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3.8 VIRTUAL AUCTIONS

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



ACTIVITY 1.1

State the differences between Electronic Auction and Traditional Auction.

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3.9 ONLINE SHARE DEALING

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

3.10 GAMBLING ON THE NET

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

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

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

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

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

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

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



Punter: The person who gambles or places a bet.

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

3.11 WEB BOOKING SYSTEMS

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

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



3.12 LET US SUM UP

In this unit we have discussed the following aspects-

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

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



3.13 FURTHER READING



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

3.14 ANSWERS TO CHECK YOUR PROGRESS

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

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

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

The product is electronic and can be delivered via the net

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

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

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

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

The customers can check their account balances at any time.

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

Credit transfers so that bill can be paid online.

Maintenance of standing orders and direct debits.

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



4.15 MODEL QUESTIONS

Q 1: What is meant by Web booking System?

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

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

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UNIT 4: ONLINE BUSINESS PLANNING

UNIT STRUCTURE

4.1 Learning Objectives

4.2 Introduction

4.3 Nature of Internet

4.4 Dynamics of Internet

4.5 Requirement for Internet Business Strategy to Succeed

4.6 Developing and Deploying the System

4.8 Let Us Sum Up

4.9 Further Reading

4.10 Answers to Check Your Progress

4.11 Model Questions

4.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

- explain the nature of internet
- discuss the dynamics of internet
- differentiate between Pure online and Brick and click Business
- describe the requirement for Internet Business Strategy to succeed

4.2 INTRODUCTION

Internet is not a new phenomenon. Its roots lie in a collection of computers that were linked together in the 1960s as a project of the Advanced Research Projects Agency (ARPA) of the U.S. Department of Defence. The initial goal was to create a network that enables the safe transmission of data between military computers at different sites through redundant communication routes. The redundancy in communication lines was to ensure uninterrupted data transfer in case of a war. In addition, computer functions were decentralized so that no single site would become the potentially vulnerable site. In the ensuing years, other government networks

were hooked up to the APRANET and the whole become the Internet. Since the mid-1980s, the National Science Foundation (NFS), an agency of the U.S. Government, and other government entities controlled access to the Internet. Internet use by individuals or businesses not affiliated with one of these organizations was virtually nonexistent.

Internet as a means for commerce did not become a reality until the 1990s, when it became a popular and mainstream medium for the dispersal of information. In 1991, the NFS eased restrictions and allowed commercial traffic onto the Internet. This action was tantamount to opening the floodgates of the Amazon River. In April 1995, the U.S. government further relinquished control of the Internet to independent governing bodies, which relaxed the restrictions for Internet access. Companies were allowed to provide unfettered for-profit Internet access.

Ever since commercial use of the Internet was allowed, the growth in subscribers and traffic has been phenomenal. Due to its cheapness and speed, long-distance commerce transactions of all sorts were possible. Though the current process of finalizing commercial transactions requires human interaction with the actual processing of orders, the use of "secure server"-networks hub that are able to prevent internet "pirates" from garnering other people's credit information-is the basis for real-time processing and validation of orders with the use of internet-based fund transferable systems such as e-cash or cyber cash, smart cards, electronic checks and credit cards. The increase in speed provides for both a very large volume of electronic transactions, but also for better customer service, both of which provide financial institutions with a definite competitive advantage over businesses not utilizing the Internet.

4.3 NATURE OF INTERNET

The Internet allows millions of computers to be linked together offering a global network that connects universities, individuals, government agencies, private enterprises. It brings people from all over the world together and reduces the distances between people in many ways. English has remained language of the web but there has been a significant growth of sites in other

languages. A lot of research is being done on this. As the language barrier is overcome businessman can conduct e-commerce with another businessman or consumer anywhere in the world. Unfortunately the political structures of the world have not kept up with Internet technology; so doing business internationally presents a number of challenges. Currency conversions, tariffs, import and export restrictions, local business customs and the laws of each country in which a trading partner resides can make international electronic commerce difficult.

These legal formalities need to be addressed to make e-commerce a worldwide practice. These legal problems relate to the item and privacy concerns. Every country has the right to pass its own laws and collect taxes on business that operate within their jurisdiction. Companies collect a lot of personal information from the customer for their databases and this information in the wrong hands can lead to fraud. Hence, many European companies limit the collection and use of personal information.



CHECK YOUR PROGRESS

Q.1 : Explain the nature of internet.

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4.4 DYNAMICS OF INTERNET

The current phase of development of the networked knowledge society is characterized by the emergence of new communication technologies. The most significant being digital mobile telephony, notable on the GSM standard, and the Internet. These technologies, and the facilities they offer, strengthen and extend the patterns of communication and collaboration between people.

In recent years, there have been major new insights into nature and characteristics of complex social networks: The realization that they are part of a class of self-organizing networks with a scale-invariant power-law distribution of linkage, and a 'small -world" characteristic. This class of complex social network is best known in the networks of scientific

collaboration, though co-authorship analyses-with the joint authors of scientific papers being considered as linked.

However, not only these networks have these well defined "architectural feature", they also have common dynamics-Their "emergent properties" are characteristic of networks that grow by progressive accretion of new participants, each of which links to existing participants in relation to their existing linkages.

The dynamic properties of these networks have recently attracted considerable interest-principally in relation to the stability and resilience of the Internet, but also in relation to fluctuations and crises in economic and financial systems.

While the mathematics of such analysis can be complex, we are more concerned with the exploration of whether a very simple model of self-organized and self-limited growth can give possible new insights into the observed pattern of growth in GSM and Internet use; into possible future challenges of the "digital divide"- the division of world society into those connected to the knowledge society, and those not ; and into the dramatic fluctuations in growth and equity valuation of the ICT sector in recent years.



CHECK YOUR PROGRESS

Q.2 : White short note on dynamics of internet.

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4.5 PURE ONLINE VS BRICK AND CLICK BUSINESS

Pure play (online) and bricks-and-clicks represent today's two major retailing models. Setting up and running an e-business, especially one that processes a large number of transactions, requires technical, marketing and advertising expertise. Customers want access to products and services on a 24-by-7 basis and the easiest way to provide that is to move operations online. The businesses that provide the most reliable, most functional, most user-friendly and fastest services will be the ones that succeed.

Banks are moving all their operations online, as it becomes clear that the Web, unconstrained by geographic boundaries, is a more efficient vehicle for their services and allows them to operate on a truly global scale. Real-time trading in foreign markets has been made possible, as has instantaneous currency conversion. Soon, global data on financial activity will be available online in real time and global transactions through the Internet will become the norm.

People can pay their bills, write and cash checks, trade stocks, take out loans, mortgage their homes and manage their assets online. Money as we know it may cease to exist, replaced by more convenient technologies such as smart cards and digital cash. Intelligent programs will take care of the financial and logistical aspects of the interactions between the individuals and corporations that populate the Internet. All that a person will need to go shopping is a connection, a computer and a digital form of payment.

Traditional "brick and mortar" stores are already being supplemented by a multitude of electronic storefronts populating the World Wide Web. No single brick-and -mortar store can offer 50,000 products, but an online store has the capability to offer a limitless number of them. Services exist that will comparison shop for consumers, finding the best deal on any product or services. An increasing amount of consumer information is being made available, leading to better deals for customers. For instance, Web sites that post car invoice prices have made it possible for auto buyers to circumvent the sticker price. Internet shopping is already beginning to eclipse more traditional modes according to research done during the Christmas season of 1999, which found higher satisfaction rates for shopping online than it did for shopping at brick-and mortar stores or through catalogs.

In addition to business-to-consumer operations such as electronic stores and business-to-business marketplaces, services are also taking their place on the Internet. A business that orders products from a supplier online not only completes the transaction with greater speed and convenience compared to its offline counterpart, but also can keep track of the shipments. Business -to-business Web sites are also channels that permit close cooperation between different businesses as well as the outsourcing services that are and will continue to be, so crucial to the Internet economy.

The tradition from brick-and-mortar businesses (business that have only a physical presence) to click-and -mortar businesses (businesses that have both an online and an offline presence) is happening in all sectors of the economy. It is now possible for a business to operate effectively without an office, because the employees can conduct all communications via phone, voice mail, fax, e-mail and the emerging capabilities of the Internet. There are already Internet services that integrate phone, fax, voice and e-mail, and in the future, new technologies will further facilitate the virtual office. Some businesses have already divested themselves of all their bricks-and-mortar and gone completely online. Despite the shift online, the brick-and-mortar segments of many businesses will not become obsolete. They will still have their uses and purposes, but to work effectively, they must be integrated with their online counterparts, as the Internet economy requires integration to facilitate the transfer of information.



CHECK YOUR PROGRESS

Q.3 : Differentiate between pure online and brick and click business.

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4.6 REQUIREMENT FOR INTERNET BUSINESS STRATEGY TO SUCCEED

Requirements in terms of an Internet design are much broader than normal project requirement. These requirements need to encompass everything needed by the organization to reach vision and goal.

Here are some requirements to consider:

- **Data Requirements-** What data and information do we need to attain our goals? What information do we need for monitoring our efforts? What content do we need? Where can we get access to this data and information? How does the data and information need to be analyzed?

- **Technology Requirements -** What infrastructure do we need to support our strategy (network, servers , etc)? What system architecture is needed (operating systems , web browsers , etc)? What applications need to be supported ? Do any of the systems or applications need to work together ? How ? Do we have any legacy systems that need to be integrated ?
- **Resource Requirements -** What skills and expertise are needed for our strategy ? Are the skills available within the organization ? Will new staff need to be hired ? Are consultants required ? Are there any other resources we can use to meet our requirements (voluntary ,part -time , interns)?
- **Standards Requirements -** Are there any organizational or external standards that require compliance? What standards should be required or created in order to assure quality ? How will these standards be monitored ?
- **Organizational Requirements-** Are there any organizational changes needed to meet our goals ? Are the people resources required spread out throughout the organization ? How will they be organized and managed ?
- **Executive Support -** What is required to ensure top-level executive support and buy-in ? How will executives be briefed on progress ? What involvement is required by executives to ensure success ?
- **Coordination & Oversight Requirements -** Who is responsible for coordinating strategy efforts ? Who is responsible for making decisions related to strategy implementation ? Who is the champion of the strategy ? What responsibilities are required and how are they assigned ? Who is monitoring progress and how is progress reported ? Who in these cases does not need to be an individual . A team may be more effective especially if diverse departments are involved .

- **Policy Requirements-** Are there any existing policies that need to be considered and possibly altered to attain our goals ? Do any policies need to be put into place ? Are there any external policies that need to be followed ?
- **Staffing Requirements-** If we need more staff , how do we justify them ? What qualifications should new staff have ? What support personnel are needed for implementation and supporting new staff ? Can volunteers be used ? Part -time personnel ? Interns ? Are there any professional credentials or certifications that are relevant ? What are the job descriptions for any new positions (or changes)?
- **Budget Requirements-** What funding is required ? How will we be funded ? Can we redirect existing funding ? Are there opportunities for cost sharing ? How do we get more funding/ money ?How will staff positions be allocated ? How will expenses and profits be allocated ? How can we mitigate any future budget shortfalls ?
- **Community & outreach Requirements-** What communications are required to keep implementation of our goals on track ? Who will be responsible for coordinating any communications ? Who needs to be informed of progress ? Are any external organizations or stakeholders involved ?
- **Risk assessment Requirements-** What major challenges could affect the outcome of our strategy (both internally and externally)? How will we recognize risks and overcome them ? What might happen if we do not overcome obstacles ?

4.7 DEVELOPING AND DEPLOYING THE SYSTEM

Develop -

System development cycle involves five-stages for a virgin situation . These stages are :

1st stage -Defining the system and its objectives: In this stage the system and its elements are defined .The boundaries and scope of the

system are set and the objectives for the system are set in lieu with the objectives of business . Thus in this stage the usage and scope of the system is assured to the users and designers of the system . Along with this the terms of reference are also set in this stage .

2nd stage-Developing the system: This is the most important step in which the system is actually developed . In this stage, the system analysis the existing business systems and changes therein. This also helps in providing clear understanding of real life situations, problems and weaknesses. It involves system analysis of similar systems. In this stage, the given ahead things are carried out:

- Identification of information needs for decision-making and defining them . This ensures that the information requirements are designed as a support to decision - making.
- Examining the feasibility of the system which involves ascertaining the technical, economic and operational feasibility . This requires a lot of hard work and is done to ensure that the efforts that shall be made for the system do not go waste.
- The conceptual design of the system is prepared after working-out the feasibility of the system.
- Initial prototype of the system is prepared to ensure the supply of the basic information needs . It helps to know the changes in the information needs if any and the changes in conceptual design.
- Design structured break up of the system in the smaller sub-systems preferably in hierarchical order . This helps to understand the functioning of the system by bringing clarity about input and output of each subsystem.

In this stage, a computer system output, input, processing and procedure design is prepared. Along with this, flow chart is prepared and documentation of the system is done . This includes a data base design architecture and application development design. By doing this, step by step computer design development is ensured which provides clarity to the user and designer through documentation.

3rd stage- Installing and testing the system: In this stage, the system is tested and installed on the hardware for implementation. After thorough operational testing, the system is installed on computer system. In this step the operational problems are resolved and the user gets live experience of the system. Checks and controls are ensured through testing and parallel runs and modifications, if any, are carried out .

4th stage-Operating the system: In this stage the system is fully operated and the earlier system, in any, is discontinued. In this stage, the user confidence is built and evaluation of the performance of the system is done.

5th stage-Reviewing and Evaluating the system: This is the final stage in which the system is reviewed to check whether the system meets the objectives set or not and whether the system is running smoothly. Steps are taken as required . This helps to understand the problems and make improvements.

Deployment-

In its IT context, deployment encompasses all the processes involved in getting new software or hardware up and running properly in its environment , including installation , configuration , running, testing and making necessary changes .

Procedures include performance testing services encompassing review of architecture and usage, predictive modeling , stress testing , and detailed analysis and recommendations .

Final deployment of the site includes setup and testing on the clients systems



4.8 LET US SUM UP

In this unit we have discuss the following aspects-

- The nature and dynamics of internet.
- The differences between Pure online and Brick and Click Business.
- The business strategy for online business.



4.9 FURTHER READING

1. E-Commerce, Strategy, Technologies and Applications - David Whiteley, Tata Megraw-hill.
2. E-commerce and its Applications, - US Pandy, Rahul Srivastava, Saurabh Shukla, S. Chand & Company Ltd.
3. Essentials of E-commerce Technology, - V. Rajaraman, PHI

4.10 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: The Internet allows millions of computers to be linked together offering a global network that connects universities, individuals, government agencies, private enterprises. It brings people from all over the world together and reduces the distances between people in many ways.



The increase in speed provides for both a very large volume of electronic transactions, but also for better customer service, both of which provide financial institutions with a definite competitive advantage over businesses not utilizing the Internet

Ans to Q2: The current phase of development of the networked knowledge society is characterized by the emergence of new communication technologies. The most significant being digital mobile telephony, notable on the GSM standard, and the Internet. These technologies, and the facilities they offer, strengthen and extend the patterns of communication and collaboration between people.

However, not only these networks have these well defined "architectural feature", they also have common dynamics-Their "emergent properties" are characteristic of networks that grow by progressive accretion of new participants, each of which links to existing participants in relation to their existing linkages .

The dynamic properties of these networks have recently attracted

considerable interest-principally in relation to the stability and resilience of the Internet, but also in relation to fluctuations and crises in economic and financial systems.

Ans to Q3: Pure play(online) and bricks-and-clicks represent today's two major retailing models. The current study answers four questions comparing the two models in terms of the e-commerce benefits achieved and information systems management practices used to achieve them.

It applies a Web-based survey to compare 69 pure plays to 348 bricks-and -clicks retailers in terms of the market expansion, customer service, back-end efficiency, inventory management, and cost reduction benefits reaped as well as in terms of the bench marking process redesign, and planning practices used. It found market expansion as the top benefit for both types of retailers.

Pure plays exceed bricks-and-clicks at achieving back-end efficiency, inventory management, and cost reduction benefits.

Pure play retailers apply benchmarking to reap their benefits while bricks-and-clicks retailers use process redesign and planning to reap theirs.

Pure play retailers are better able to utilize benchmarking to realize market expansion and customer service benefit. On the other hand, bricks-and-clicks retailers are better able to utilize process redesign to realize inventory management and cost reduction benefits.



4.11 MODEL QUESTIONS

Q 1: Define pure online business.

Q 2: Discuss the requirement for internet business strategy to succeed?

Q 3: Explain the various stage of system development.

Q 4: Differentiate between pure online business and brick and click business.

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UNIT 5 : TECHNOLOGY FOR ONLINE BUSINESS

UNIT STRUCTURE

5.1 Learning objectives

5.2 Introduction

5.3 Internet

- 5.3.1 History of Internet
- 5.3.2 Client – server
- 5.3.3 TCP/IP

5.4 IT Infrastructure

- 5.4.1 Characteristics of IT Infrastructure
- 5.4.2 Elements of IT Infrastructure

5.5 Middleware

5.6 Contents: Integrating text and E-business application.

- 5.6.1 Hypertext
- 5.6.2 Hyper Media
- 5.6.3 HTTP

5.7 Let Us Sum Up

5.8 Further Reading

5.9 Answers to Check Your Progress

5.10 Model Questions

5.1 LEARNING OBJECTIVES

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

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

5.2 INTRODUCTION

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

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

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

5.3 INTERNET

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

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

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

The three main defining characteristics of the internet are-

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

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



CHECK YOUR PROGRESS

Q 1: Define internet.

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5.3.1 History of Internet

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

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

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

1960's

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

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

1970's

Networking tools are developed in the 1970's including:

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

1973-FTP (file transfer protocol) is introduced.

1980's

Several significant events occurred in 1983, including:

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

1982-1983:

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

1985-86:

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

1990- The APRANET is dissolved.

1991:

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

1993:

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

1995:

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

5.3.2 Client - Server

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

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

Client

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

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

Characteristics of a client:

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

Client sends requests to server.

Client waits for and receives server replies.

Types of client

Clients are generally classified in these types:

Fat clients

Thin clients

Hybrid clients.

Server

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

Characteristics of a server:

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

Server waits for requests.

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

A server provides many benefits including;

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

Centralization: files are in one location for easy administration

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

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

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

5.3.3 TCP/IP

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

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

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

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

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



CHECK YOUR PROGRESS

Q 2: Define TCP/IP.

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5.4 IT INFRASTRUCTURE

Information technology

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

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

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

Information technology infrastructure

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

5.4.1 Characteristics of IT Infrastructure

The desirable characteristics of IT infrastructure are:

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

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

5.4.2 Elements of IT Infrastructure

Typical elements in an IT infrastructure include:

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

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



CHECK YOUR PROGRESS

Q 3: Explain the various characteristics of IT infrastructure.

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5.5 MIDDLEWARE

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

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

Some middleware services are:

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

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

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

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

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



CHECK YOUR PROGRESS

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

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5.6 CONTENTS: INTEGRATING TEXT AND E-BUSINESS APPLICATIONS

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

5.6.1 Hypertext

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

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

5.6.2 Hypermedia

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

Some technologies used to implement hypertext and hypermedia are:

HTML

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

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

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

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

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

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

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

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

5.6.3 HTTP

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

It is based on the client/server principle.

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



5.7 LET US SUM UP

In this unit we have discussed the following aspects –

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

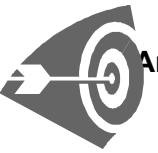


5.8 FURTHER READING

1. E-commerce and its Applications, - US Pandy, Rahul Srivastava, Saurabh Shukla, S. Chand & Company Ltd.
2. Essentials of E-commerce Technology, - V. Rajaraman, PHI
3. E-commerce, - Ritendra Goel, New age international publishers.

5.9 ANSWERS TO CHECK YOUR PROGRESS

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



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

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

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

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

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

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

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

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

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

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

Some middleware services are:

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

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

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

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

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



5.10 MODEL QUESTIONS

Q 1: Explain E-business applications.

Q 2: Differentiate between HTML and HTTP.

Q 3: Discuss the elements of IT infrastructure.

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UNIT 6: PAYMENT THROUGH INTERNET

UNIT STRUCTURE

6.1 Learning Objectives

6.2 Introduction

6.3 Online Payment Mechanism

6.4 Electronic Payment System

- 6.4.1 Credit Card Payment
- 6.4.2 Electronic Fund Transfer
- 6.4.3 Electronic Cheque Payment
- 6.4.4 Electronic Cash

6.5 Payment Gateways

6.6 Visitors to Website

6.7 Plastic Money

6.8 Electronic Payment Security

6.9 Let Us Sum Up

6.10 Further Reading

6.11 Answers to Check Your Progress

6.12 Model Questions

6.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

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

6.2 INTRODUCTION

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

6.3 ONLINE PAYMENT MECHANISM

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

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

- Customer gateway
- Bank clearinghouse
- Merchant

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

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

Online banking usually offers such features as:

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

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

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

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

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

Advantages of CBS

All CBS branches are inter-connected with each other. Therefore, customers of CBS branches can avail various banking facilities from any other CBS branch located any where in the world. These services are:

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

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

CBS provides some other benefits also. These are:

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



CHECK YOUR PROGRESS

Q 1: What is meant by online payment mechanism?

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6.4 ELECTRONIC PAYMENT SYSTEM (EPS)

Electronic payment systems are online payment systems. The goal of their development is to create analogs of checks and cash on the Internet.

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

Features of EPS

An EPS implements all or some of the following features:

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

Advantages of Electronic Payment System

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

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



CHECK YOUR PROGRESS

Q 2: Explain the electronic payment system.

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6.4.1 Credit Card Payment

There are many other steps involved before a credit card payment is complete. There are two systems which can be used. One is a simple system in which the credit card number is exposed

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

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

6.4.2 Electronic Funds Transfer

Before describing cheques payment in e-commerce it is necessary to describe a scheme called Electronic Funds Transfer (EFT) which is an essential part of clearing cheques in a banking system. What is meant by clearing a cheque? If A issues a cheque favouring B, it will be written on a cheque in bank A's bank (say X). B

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

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

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



CHECK YOUR PROGRESS

Q 3: Explain electronic fund transfer.

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6.4.3 Electronic Cheque Payment

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

to physical cheques. Assuming this condition is satisfied we will describe a method.

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

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

There are five parties involved in the transaction.

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

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

Format of e-cheque sent by purchaser (payer)

Unique id of e-cheque

Date of cheque

Payee's id and name

Amount to be paid

Payer's bank code

Payer's account number

Digital signature of payer

6.4.4 Electronic Cash

The cost of each transaction when a credit card or a cheque is used is high. It is estimated that each transaction costs at least

five rupees. Thus, it is not appropriate for low value transactions, e.g., less than two hundred rupees. We normally use cash for such transactions. The major advantages of cash are:

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

The major disadvantages of cash are:

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

6.5 PAYMENT GATEWAY

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

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

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

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

Benefits of payment gateway-

benefits of having a payment gateway are:

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



CHECK YOUR PROGRESS

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

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6.6 VISITORS/AUDIENCE TO WEBSITE

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

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

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

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

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

6.7 PLASTIC MONEY

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

cards, pre-paid cash cards and store cards.

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

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

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

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

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

6.8 ELECTRONIC PAYMENT SECURITY

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

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

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

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

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

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

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

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

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

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

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

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

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



6.9 LET US SUM UP

In this unit we have discussed the following aspects–

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



6.10 FURTHER READING

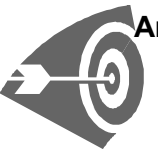
1. Essentials of E-commerce Technology, - V. Rajaraman, PHI

2. E-commerce, - Ritendra Goel, New age international publishers.
3. E-Business and E-commerce for manager's, - Harvey M. Deitel, Paul J. Deitel, Kate Steinbuhler, Pearson.

6.11 ANSWERS TO CHECK YOUR PROGRESS

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

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



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

- Customer gateway
- Bank clearinghouse
- Merchant

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

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

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

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

Benefits of payment gateway-

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



6.12 MODEL QUESTIONS

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

Q 2: What is plastic money ?

Q 3: Write short notes on:

(i) Electronic cash (iii) Store cards

(ii) Credit card (iv) CBS

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UNIT 7: APPLICATION OF E-COMMERCE IN MANUFACTURING AND WHOLESALE

UNIT STRUCTURE

7.1 Learning Objectives

7.2 Introduction

7.3 Trade Cycle

7.4 Supply Chain

- 7.4.1 Porter's Value Chain Model
- 7.4.2 Competitive Advantage

7.5 Application of E-Commerce in Manufacturing

7.6 Application of E-Commerce in Wholesale

7.7 Let Us Sum Up

7.8 Further Reading

7.8 Answers to Check Your Progress

7.9 Model Questions

7.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

- define the trade cycle
- define the supply chain
- explain the application of e-Commerce in manufacturing area
- discuss the application of e-Commerce in wholesale business

7.2 INTRODUCTION

The application of e-commerce has led to many changes in the way business is conducted. Electronic commerce or e-Commerce is the purchasing or selling of goods or services and the transfer of funds in any way using electronic communications in inter-company and intra-company business activities.

An e-commerce solution is a solution to conduct business using technology, through an intra-, extra-, or internet solution. There are two types of e-commerce: Business-to-consumer (B2C) e-commerce involving companies selling products or services to individuals; and business -to-business e-commerce (B2B), in which companies sell to other businesses.

e-business is an umbrella term that includes e-commerce and refers to the use of the Internet and private intranet to transform a company's value chain (i.e. internal processes, supplier and partner interactions, customer relationships) with the ultimate goal of creating value for customers . A firm with an effective e-business strategy develops the capabilities needed to improve the flow of information and business intelligence among partners, suppliers, employees and customers. It also aims to solve problems for all parties that comprise its extended value chain.

Moving a business to the Internet is a sound strategy for increasing business volume- making a business instantly international and opening up possibilities that can never exist in the "real world". It does not matter even if businesses are small and localized. Going international will facilitate better support since e-commerce solutions will make it a 24X7 business. A business with a strong Internet presence can reduce staffing and office space overhead, which can result in more competitive pricing of services and products. The internet can provide a more economical form of advertising. A website with e-commerce capabilities actually draws people back; building brand loyalty and awareness which are rare in mainstream advertising. Integrated payments with Banking are possible thereby providing robust support for accounting systems. In e-commerce, the interaction with the system takes place in almost real time and therefore allows the customer or bidder to respond more quickly and reduces the lag time between discussion and purchase

7.3 TRADE CYCLE

A trade cycle is the series of exchanges, between a customer and supplier that take place when a commercial exchange is executed. A general trade cycle consists of four phases. These are described below:

(i) **Pre-sales:** This phase consists of various tasks in finding a supplier and agreeing the terms.

This phase can be further classified in:

- Search- finding a supplier
- Negotiate-agreeing the terms of trade

(ii) **Execution:** This Phase consists of various tasks in selecting goods and taking delivery.

This phase can be further classified in:

- Order
- Delivery

(iii) **Settlement:** This Phase consists of various tasks in invoice (if any) and payment.

- Invoice
- Payment

(iv) **After-Sales:** This Phase consists of various tasks in following up complaints or providing maintenance.

Generic Trade Cycles

Three generic trade cycles can be identified:

- Repeat trade cycle: These trade cycles contains regular, repeat transactions between commercial trading partners.
- Credit trade cycle: These trade cycles contains irregular transactions between commercial trading partners.
- Cash trade cycle: These trade cycles contains irregular transactions in once-off trading relationships (commercial or retail).

Nature of Trade Cycle

For business-to-business transactions the trade cycle typically involves the provision of credit with execution preceding settlement whereas in consumer -to-business these two steps are typically co-incident.

The nature of the trade cycle can indicate the e-commerce technology most suited to the exchange. On this basis, business transactions are classified as following:

- Commercial transactions that are repeated on a regular basis, such as supermarkets replenishing their shelves, are one category of trade cycle.

EDI is the e-commerce technology appropriate to these exchanges.

- Consumer transactions tend to be once off (or at least vary each time) and payment is made at the time of the order.

Internet e-commerce is the technology for these exchanges.

- The third generic trade cycle is the non-repeating commercial trade cycle and Internet e-commerce or an electronic market is the appropriate e-technology for this.



CHECK YOUR PROGRESS

Q.1 : What is trade cycle? Explain various phases and types of trade cycle.

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7.4 SUPPLY CHAIN

Supply chain is a network of facilities and distribution options that performs the functions of procurement of materials (from supplier), transformation of these materials into intermediate and finished products (manufacturing), and the distribution of these finished products to customers (to customer). This network adds value for customers through the manufacture and delivery of products.

The entities of a supply chain typically consist of manufacturers, service providers, distributors and retail outlets. Supply chain activities transform raw materials and components in to a finished product. The primary

objective of supply chain management is to fulfill customer demands through the most efficient use of resources.

In today's rapidly changing business environment, ever-greater demands are being placed on business

- To provide products and services quicker
- With greater added value
- To the correct location
- With no relevant inventory position.

Customers want more quality, design, innovation, choice, convenience and service, and they want to spend less money, effort, time and risk. The supply chain of a company consists of different departments, ranging from procurement of materials to customer service.

Supply chain management means transforming a company's "supply chain" into an optimally efficient , customer-satisfying process ,where the effectivity of the whole supply chain is more important than the effectivity of each individual department.



CHECK YOUR PROGRESS

Q.2 : What is supply chain?

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7.4.1 Porter's value chain model

To better understand the activities through which a firm develops a competitive advantage and creates shareholder value , it is useful to separate the business system in to a series of value-generating activities referred to as the value chain. Michael Porter introduce a generic value chain model that comprises a sequence of activities found to be common to a wide range of firms.

Porter's primary and support activities

The porter's primary value chain activities are-

- Inbound logistics: The receiving and warehousing of raw materials, and their distribution to manufacturing, as they are required .
- Operations: The processes of transforming inputs into finished products and services.
- Outbound Logistics: The warehousing and distribution of finished goods .
- Marketing & Sales: The identification of customer needs and the generation of sales.
- Service: The support of customers after the products and services are sold to them.

These primary activities are supported by support activities .

- The infrastructure of the firm: organizational structure , control systems, company culture , etc.
- Human resource management: employee recruiting, hiring, training, development and compensation.
- Technology development: technologies to support value- creating activities.
- Procurement: purchasing inputs such as materials, supplies and equipment.

Linked value chains

Value chain activities are not isolated from one another . Rather, one value chain activity often affects the cost or performance of other ones . Linkages may exist between primary activities and also between primary and support activities.

Role of Electronic Commerce in Value Chain

The capability of internet technology will change the way we do business with our suppliers and customers, as well as change the face of business .

- Intranet is a secured network of web pages and applications, which can be accessed by anyone within a company firewall.

- Internet is a collection of servers and networks, which allow users access to information and applications outside of the company firewall.
- Extranet is a collaborative [private/secure] network that uses internet technology to link businesses with their suppliers , customers, or partners that share common goals .
- E-commerce is buying and selling electronically. E-Business is using the capabilities of internet technology to conduct business electronically.

7.4.2 Competitive Advantage

A firm is said to possess a competitive advantage over its rivals, if sustains profits that exceed the average for its industry. The goal of much of business strategy is to achieve a sustainable competitive advantage .

Michael Porter identified two basic types of competitive advantage:

- Cost advantage
- Differentiation advantage

A competitive advantage exists when the firm is able to deliver the same benefits as competitors but at a lower cost (cost advantage), or deliver benefits that exceed those of competing product (Differentiation advantage).Thus, a competitive advantage enables the firm to create superior value for its customers and superior profits for itself .

Cost and Differentiation advantages are known as positional advantages since they describe the firm's position in the industry as a leader in either cost or differentiation.

7.5 APPLICATION OF E-COMMERCE IN MANUFACTURING

Manufacturing Information Systems

The characteristics of the information systems depend on the type of manufacturing operations, and can be characterized as discrete, batch process, continuous process, or hybrid (combining more than one form). In discrete operations raw material is processed in distinct units. Work-in-process can be tracked by lot, work order, or batch. Typical discrete, lot-based industries include semiconductors; disc drives; and assembly operations in the auto and commercial aircraft industries.

In batch process operations, such as pharmaceutical manufacturing, material is converted from one form or state to another through various processing steps and is tracked by batch, lot, or mass quantity. Material in batch process-type operations may be spread across several conversion steps at once. Batch process manufacturers include fast-food, beverage pharmaceutical and chemical companies.

In continuous process operations, such as oil refining, raw material is processed without interruption in a continuous flow. Finally, some producers, such as specially chemical companies, may require a combination of batch process and discrete operations to manufacture their products.

Discrete versus Process Manufacturing Market

Process manufacturers differ from their discrete cousins in four respects: (1) manufacturing methods, (2) packaging requirements, (3) asset allocation, and (4) product consistency. Discrete products such as automobiles, air-planes and bicycles are produced by gathering multiple raw material and component inputs to create a single finished product. Process manufacturers, on the other hand, create finished products by heating, mixing, or separating single or multiple inputs to create multiple outputs. Take for instance, PepsiCo., which takes a single input (potatoes) and churns out multiple outputs: mashed potatoes, fries and chips. Process companies are also distinguished by their relatively diverse packaging and regulatory requirements.

Discrete and process manufacturers differ markedly in their distribution of assets. Discrete manufacturers have a huge investment in

inventory at any given moment, including raw materials, work in process, and finished goods. Process manufacturers have a much larger investment in plant and equipment. Allocating costs to finished products based on inventory is relatively straightforward in the discrete arena: the components of a specific automobile model are easily identified, sorted, and traced to the final product. A food processing plant baking saltines, cookies, and various pastries, on the other hand, faces a tougher time in allocating costs and determining profitability by product line.

What makes process manufacturing different? Process manufacturing has to support additional requirements and has a different orientation than traditional discrete manufacturing.

A process plant represents a considerable capital investment in instrumentation and equipment. Therefore, capacity planning is the first priority when developing a master production schedule. Production is typically accomplished via a process line wholly committed to a work order.

Unlike discrete manufacturing, where work-in-process (WIP) inventory can act as a planning and scheduling buffer between work centers, process environments often have to complete all phases of production within tight time tolerances. Many products have shelf-life characteristics or can alter with time. For all these reasons, finite scheduling is often a must.

Process environments almost always have traceability requirements. Whether imposed by governmental regulation or simply a matter of good manufacturing practice, procedures for full traceability have led to a more comprehensive software solution than is typically found in the discrete manufacturing realm.

The process industries also have special requirements not easily dealt with in a bill of material structure. There is often a requirement for the manufacture of co products and byproducts, sometimes from several separate stages in a process. Multiple products are made concurrently, and parallel activities must be scheduled to bring intermediate products together for blending or some other process.

Units of measure have to be highly flexible to allow recipes for different batch sizes to be combined. While a bill of material's output is always a single unit, processing ingredient quantities are often expressed as "units per".

Unlike the discrete manufacturing model, quality is intimately tied into a process MRP system. For a chemical/drug manufacturer, potency, grade, acidity, and other parameters can be tied to ingredients listed on recipes and to the actual product. Procedural requirements for sampling and monitoring are also built into the recipe. Test results can be tied to specific customer orders and to product lots ready for shipment.

Process companies face unique problems in product quality and consistency. Manufacturers must ensure the correct proportion of ingredients in their finished goods. Product formulation and processing have a profound impact on a product's yield. Food, chemical, and drug producers face challenges in removing variability created by moisture, spoilage, overcooking, and other problems. Such variability increases the stakes: if a batch fails to meet specifications, it must be destroyed. In short, increased global competition spawned a new fervor among process manufacturers in the 1980s. consolidation in fast-food, supermarket, and drug chain companies, already surviving on low margins, paced renewed pressure on manufacturers to reduce costs and improve logistics.

Process manufacturing industries: Key challenges: Three key challenges that will define success or failure for process manufacturing firms in their respective industries are: (a) flexible response, (b) cost reduction and traceability; and (c) product consistency/quality.

(a) Flexible response. Process manufacturers must be able to respond quickly to market trends by supplying their customers with high-quality, low-cost products. Drug stores are forcing pharmaceutical firms to provide electronic communication (such as EDI) in order to integrate their production schedules tightly with their order and replenishment systems in order to avoid stock-outs and minimize lost sales. Fast food chains such as McDonald's are demanding of

their suppliers more sophisticated lot tracking as a means to track down problem shipments. A week-long McDonald's promotion for a new chicken sandwich, for example, will accelerate demand for processed chicken throughout the country, leaving the few privileged processed chicken suppliers to McDonald's scurrying to meet demand. The ability to ramp up production rapidly and trace shipments promptly is essential to conducting business.

(b) Cost reduction and traceability. Just-in-time (JIT) inventory techniques are increasingly implemented by process manufacturers who must balance production capacity with current raw material prices in order to optimize scheduling. Process manufacturers face special inventory challenges because of the perishable nature of their raw materials, which must be properly scheduled to avoid wasting an entire batch of ingredients. Finally, food, beverage, and chemical firms want accurate costing information to make product planning decisions. Rather than accepting dated, arbitrary overhead cost allocations, manufacturers want to be able to trace energy, heating, machining, and indirect labor costs to the production of specific products. Increasingly, process manufacturers want to play what-if scenarios to determine the cost of a recipe modification for a production run of crackers or cookies, for example. Managing the inventory of flour, food coloring, and other chemical ingredients can become a nightmare for the process manufacturer who cannot adequately plan the complex factory scheduling of numerous, dissimilar products.

(c) Product consistency/quality. Unlike their discrete cousins, process manufacturers face unique challenges in managing and monitoring the consistency of their products. As a beer manufacturer begins to prepare a new batch of beer for production, a certain interval of time passes between the preparation of the ingredients and the time at which the yield becomes acceptable. Better control over ingredients and formula management can improve the yield and

reduce the number of hours required for processing. Even a slight reduction in processing hours caused by a quicker realization of the yield, therefore, can significantly reduce costs and free up the machinery for producing the next run of product.

Today, process manufacturers are anxious for software specifically created for managing fixed costs. Discrete manufacturing systems focus on all phases of inventory management, from raw materials through the production of finished goods. Process manufacturers require a more precise allocation of staff, waste, byproducts, and plant costs because of the huge plant property and equipment costs attendant to producing their products. Using discrete automation products for process automation was like fitting a square peg into a round hole. Clearly, there is a market opportunity here.

Type of manufacturing information systems

The goal of applying computer automation to the manufacturing environment is improved efficiency and lowered costs, both direct and indirect. There are several different computer software applications that are designed for various stages of the product life cycle, from computer-aided design to computer-assisted production on the plant floor.

Overview of the market Far from being a localized niche, the market for manufacturing software and services comprises over a $3 billion opportunity. Moreover, just 15 percent of the market is penetrated by "packaged" manufacturing software such as SAP or PeopleSoft; that is, non-customized software supplied by software developers, as opposed to in-house, custom-written programs for main frame or minicomputer system.

During the 1960s and 1970s, manufacturers experimented with a variety of mainframe-based automation solutions that frequently required a team of in-house programmers and consultants to write custom programs to solve production scheduling, manufacturing and logistics, and financial cost reporting. Numerous firms began to develop generic automation tools for manufacturers, focusing on materials requirements

planning (MRP-1), for the discrete environment. This allowed aerospace, automotive, machinery, and other discrete manufacturers-for the first time-to draw on a well-defined series of tools for their production and cost reporting objectives.

In the last several years, large companies have reduced their dependence on large, expensive, centrally located mainframe computing systems and information systems staffs. This movement toward downsizing or 'right sizing" has resulted in the adoption of smaller, cheaper, faster departmental computer systems. The manufacturing sector has mirrored this trend. In fact, most of the major MRP systems for manufacturing run on mid-range computing systems. IBM's AS/400 line has the greatest share, and Digital's VAX computer line is second, followed by Hewlett-Packard's 3000 line. Others account for the rest of the market.

The primary software applications for planning and executing producing once a product is designed include: manufacturing resource planning (MRP-2) systems, enterprise resource planning (ERP) systems, manufacturing execution system (MES), and control systems for automated equipment. In the past, developers used a common sense approach for identifying the business requirements. This was crucial, because an understanding of business requirements forms the basis for designing and developing manufacturing systems. The process is no different today. However, the business environment changes are much more unpredictable than they were in the past.

Manufacturing Resource Planning : Manufacturing resource planning systems contain functions for planning production and purchase orders using basic planning rules to project capacity and material requirements for a specific job. MRP is based on the assumption that orders would be collected, grouped together for material requirements explosions, and subsequently organized into "efficient" production runs called the weekly master production schedule (MPS).

Traditional MRP systems are not adequate for the customer-driven model of modern business. These systems plan on a daily basis and are often

oblivious to the real status of all the resources required at an operation and totally ignorant of the actual processes on the factory floor. Unfortunately, the production process is never that simple, or easy. Detailed scheduling and sequencing must be concerned with far more than available machine time. Customers' change requests or other deviations from the seasonal or production forecast, tooling, labor, engineering drawings, part programs, and other resources are factors that cause disruptions. All of these result in excessive and unnecessary manual intervention.

The realities of manufacturing are seldom reported back to the MRP system in the front office. Changes in starting and completion dates, current status of all jobs in progress, and utilization of resources are all elements that deteriorate the value of MRP. The result is a gaping canyon between the planning and the execution phases.

Enterprise Resource Planning : With the increasing push toward customized manufacturing, the need for flexibility was not addressed adequately by existing MRP systems. Thus, the desire to replace MRP with systems such as enterprise resource planning (ERP) arose. The change in nomenclature reflects the fact that system capabilities go far beyond those of core modules such as material planning, production scheduling, and bills of material.

Although ERP is sometimes thought of as the next generation of MRP systems, it is really much more. Whereas MRP schedules one plant, ERP is strong in support for multiple plants, multiple suppliers, and multiple currencies, and it will schedule an entire multisite, global organization, including such functions as plant management, inventory control, and order processing. These processes are additionally integrated with other applications such as human resources, procurement, transportation/ distribution, and accounts receivable.

Enterprise resource planning systems help manufacturers translate forecasted demand or order backlog into a manufacturing plan of raw materials, gross capacity and production orders for the plant floor. They also track the associated financial and accounting paperwork, and in fact

are most commonly associated with financial transaction automation. Since ERP systems only collect historical yield and cost data and do not provide real-time information about the complete status of operations, they do not support the proactive or ongoing management of the actual production process as it occurs.

With the basic functionality needed to optimize a plant's business operations defined, ERP systems have evolved from primarily business/ accounting systems into something more fully integrated with both plant floor operations and the larger concerns of the enterprise, especially logistics management.

However, manufacturers increasingly are recognizing that these tools, while effective in the functions for which they were designed, do not have adequate capabilities to manage the critical variables of the dynamic production process on the plant floor. That is why manufacturing execution systems (MES) were developed.

Manufacturing Execution Systems (MES) - Manufacturing execution systems (MES) are factory floor performance monitoring systems that complement the planning systems. MES allows companies to track, monitor, and control the five essential elements of production: materials, equipment, personnel, work instructions, and facilities. According Peter Drucker, MES systems are necessary because traditional cost accounting measures only the cost of producing. They ignore the cost of not producing (often called indirect, activity-based costing), whether the result of machine downtime or quality defects that require scrapping or reworking a product.

Historically, the factory floor has been far less automated than the resource planning systems-MRP, MRP-2, and ERP. Generally, planning is accounting oriented. It can include functions such as forecasting demand, costing, sales orders management, inventory control, accounts receivable, accounts payable, purchasing, and payroll.

Across many industries, there is a growing need for MES that provide real-time visibility of production capacities, resource constraints, inventory levels, and customer orders. MES facilitates:

-Utilization of available resources to be maximized.

-Scheduling based on operation-level requirements rather than on time requirements.

-Production monitoring via graphic display to track resources, orders, and operations.

-The review of different production scenarios prior to actually performing the work.

-Electronic verification of each factory order for accuracy against standards; this is increasingly important as quality standards like ISO 9000 are promulgated.

-Electronic distribution of work instructions with corrective actions when necessary.

Manufacturing is the transformation of raw materials into finished goods for sale, or intermediate processes involving the production or finishing of semi-manufactures. The production of goods and services is the result of the efforts of many organizations- a complex web of contracts and co-operation known as the supply chain or the value system. Manufacturing requires various components (e.g. wheels, seats etc.) Sub-assemblies (e.g. engine, gearbox etc.) etc, as well as include transportation, storage, paperwork (Orders, Invoices, etc).

Each supply chain transaction adds cost without adding intrinsic value.

E-commerce can be applied to the supply chain to reduce costs or improve service. In this way e-commerce can enhance manufacturing process by

- Enhancing efficiency.
- Reducing cost/cycle time.
- Providing accuracy and flexibility.
- Supporting Inventory levels



CHECK YOUR PROGRESS

Q.3 : Explain the role of e-commerce in manufacturing.

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7.6 APPLICATION OF E-COMMERCE IN WHOLESALE

Wholesale is the sale of goods or services in large quantities and at lower prices to someone other than consumers. Wholesale consists of the sale of goods/merchandise to retailers, to industrial, commercial, institutional, or other professional business users or to other wholesalers and related subordinated services. Sometimes called middleperson, middleman or distributor.

Wholesalers frequently physically assemble, sort and grade goods in large lots, break bulk, repack and redistribute in smaller lots, for example pharmaceuticals; store, refrigerate, deliver and install goods, engage in sales promotion for their customers and label design.

Problems of Traditional Wholesale System

Under the impact of market forces, wholesale systems have undergone great changes. With various types of enterprises entering the wholesale market, traditional wholesale companies and trading corporations are now no longer the mainstream operators. Instead, specialized national or regional wholesale markets have emerged as major players.

The operating costs of an enterprise using wholesale markets as its distribution channel are high. The costs include posting resident staff at the wholesale markets, setting up local warehouses, and establishing distribution centers in different regions in order to cover the national market.

Besides, tethered by the quality of the resident staff and geographic limitation, it is difficult for enterprises to obtain the right market information

from the wholesale markets. Nevertheless, the wholesale markets have become a major component of wholesale sector characterized by its high input and low output.

Role of E-commerce in Wholesale

In a sound market economy, low operating costs, access to information and quick response are the key to success for an enterprise. Through advanced information technology, enterprises can reach out to the global market and at the same time obtain information from around the world at low cost and high speed.

Lower Transaction Costs

E- Commerce provides a fundamental solution to the problem of diminishing profit margin and brings new opportunities to the stagnant traditional wholesale business. It supports:

- Low operating costs
- Access to information
- Quick response
- Through the Internet, wholesalers can now gain the competitive edge that could only be enjoyed by multinational companies in the past.

E-commerce is developing worldwide at an unprecedented speed. Network economy has made a big impact on traditional economy. By shortening the distance between manufacturer and consumer, e-commerce poses serious threats to intermediaries in the supply chain. It also weakens the role of traditional wholesalers. Those that are unable to adapt to the network economy will be hard hit, while those that make use of new technology and seek change will transform into small but powerful new players.

It can be expected wholesalers in the future will operate more like a portal site of an enterprise where only information gatherers, market analysts, a small number of operation and management personnel and network technicians are visible. Compared to the existing major wholesalers that

have large number of employees, they will be much smaller in scale requiring less staff and less physical space. However, ubiquitous and ever expanding internet provides them with a cyberspace that will enable them to reach out to their customers throughout the world easily. It also offers them a wide range of information, intermediary and business services.



CHECK YOUR PROGRESS

Q.4 : Explain the role of e-commerce in wholesale.

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7.7 LET US SUM UP

In this unit we have discussed the following -

- E-business, is an umbrella term that includes e-commerce and refers to the use of the internet and private intranet to transform a company's value chain.
- A trade cycle is the series of exchanges, between a customer and supplier that take place when a commercial exchange is executed.
- Supply chain is a network of facilities and distribution options that performs the functions of procurement of materials (from supplier), transformation of these materials into intermediate and finished products (manufacturing), and the distribution of these finished products to customers (to customer).
- Manufacturing is the transformation of raw materials into finished goods for sale, or intermediate processes involving the production or finishing of semi-manufactures .
- Wholesale is the sale of goods or services in large quantities and at lower prices to someone other than consumers.



7.8 FURTHER READING

1. E-commerce and its Applications, - US Pandy, Rahul Srivastava, Saurabh Shukla, S. Chand & Company Ltd.
2. Essentials of E-commerce Technology, - V. Rajaraman, PHI
3. E-commerce, - Ritendra Goel, New age international publishers.

7.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: A trade cycle is the series of exchanges, between a customer and supplier that take place when a commercial exchange is executed.

A general trade cycle consists of four phases. These are described below:

- Pre-sales: This Phase consists of various tasks in finding a supplier and agreeing the terms.

This phase can be further classified in:

- Search- finding a supplier
- Negotiate-agreeing the terms of trade
- Execution: This Phase consists of various tasks in selecting goods and taking delivery.

This phase can be further classified in:

- Order
- Delivery
- Settlement: This Phase consists of various tasks in invoice (if any) and payment.
- Invoice
- Payment
- After-Sales: This Phase consists of various tasks in following up complaints or providing maintenance.

Ans to Q2: Supply chain is a network of facilities and distribution options that performs the functions of procurement of materials (from supplier), transformation of these materials into intermediate and finished products (manufacturing), and the distribution of these finished products to customers (to customer). This network adds value for customers through the manufacture and delivery of products.

Ans to Q3: Manufacturing is the transformation of raw materials into finished goods for sale, or intermediate processes involving the production or finishing of semi-manufactures. The production of goods and services is the result of the efforts of many organizations- a complex web of contracts and co-operation known as the supply chain or the value system. Manufacturing requires various components (e.g. wheels, seats etc.) Sub-assemblies (e.g. engine, gearbox etc.) etc, as well as include transportation, storage, paperwork (Orders, Invoices, etc).

Each supply chain transaction adds cost without adding intrinsic value.

E-commerce can be applied to the supply chain to reduce costs or improve service. In this way e-commerce can enhance manufacturing process by

- Enhancing efficiency.
- Reducing cost/cycle time.
- Providing accuracy and flexibility.
- Supporting Inventory levels

Ans to Q4: Wholesale is the sale of goods or services in large quantities and at lower prices to someone other than consumers. Wholesale consists of the sale of goods/merchandise to retailers, to industrial, commercial, institutional, or other professional business users or to other wholesalers and related subordinated services. Sometimes called middleperson, middleman or distributor.

In a sound market economy, low operating costs, access to information and quick response are the key to success for an

enterprise. Through advanced information technology, enterprises can reach out to the global market and at the same time obtain information from around the world at low cost and high speed.



7.10 MODEL QUESTIONS

Q.1. Explain the use of e-commerce in trade cycle.

Q.2. What are the problems of traditional wholesale system?

Q.3. Explain the role of e-commerce in value chain.

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UNIT 8: APPLICATION OF E-COMMERCE IN RETAIL AND SERVICES SECTORS

UNIT STRUCTURE

8.1 Learning Objectives

8.2 Introduction

8.3 Issues in Developing a Business Model

8.4 Changing Retail Industry Dynamics

8.5 E-commerce Application in Retail

8.6 E-commerce Application in Service Sector

8.7 Let Us Sum Up

8.8 Further Reading

8.8 Answers to Check Your Progress

8.9 Model Questions

8.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

- discuss the issues in developing a business model
- discuss the changing trend in retail industry
- discuss the changes in consumer demographics in terms of premium places and efficient use of time
- explain the changes in consumer behaviour with less on brand name and more on lowest prices.
- discuss the result of technology improvements that provide greater convenience and more information than traditional retailing
- explain the e-commerce application in retail
- explain the e-commerce application in services sector

8.2 INTRODUCTION

Retailing is expected to change with the rapid development of new online sales and distribution channels that literally can be used from

anywhere, anytime-from work, school, a hotel, car, or airplane. These developments should impact retailing as much as the advent of strip malls, catalog retailing, and TV-based home shopping.

Almost every retailer is reevaluating every aspect of its operation from customer service to advertising, merchandising to store design, and logistics to order fulfillment. Furthermore, reacting to the pressure of retailers, suppliers are assessing technology-based solutions to drive down costs (labor, delivery, and production) and become more efficient producers of goods.

Online channels such as online services and the Web also impacting traditional retail business models. In the traditional model, the customer went to the store and located the product. In the online model, the retailer seeks out the customer. The success of catalog retailers demonstrates that a significant portion of consumers have embraced the reverse model: the retailer going to the consumer.

8.3 ISSUES IN DEVELOPING A BUSINESS MODEL :

However, retailers need to consider the following issues in developing a business model.

- Product/content issues: What kinds of products are suited for online retailing?
- Software interface issues: What kind of features will constitute an effective interface? What features make it easy to find and select items for online purchase?
- Process issues: What are the specific steps in the shopping process from a consumer's perspective? What kind of processes should companies develop to fulfill orders efficiently?
- Pricing issues: How much will consumers be willing to pay for convenience?
- Payment issues: What payment methods would consumers use for online purchases?
- Market penetration issues: Would an online channel be popular with consumer? How long will such a system take to attract a critical mass and become profitable?

Understanding these issues will help companies formulate a merchandising strategy-and build a merchandising mindset-from what they sell to how they sell it; from pricing to timing; from product development to sourcing; from their choices of electronic media to how they integrate them; and from customer payment alternatives to shipping procedures. We need critical analysis of these questions in order to maintain the proper perspective on online retailing. The potential is serious, but so are the problems that lie ahead.

Before examining the implications of changing consumer behavior and online retailing in the existing retail business, let us step back for a moment and ask the question: Why should retailers consider the online environment as a way of doing business? The answer lies in understanding the market changes that affect retailing and that will continue to affect it in the future.



CHECK YOUR PROGRESS

Q.1 : What are the issues in developing a business model?

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8.4 CHANGING RETAIL INDUSTRY DYNAMICS

Important factors affecting the retailing industry dynamics are:

- Overbuilding and excess supply.
- Changes in consumer demographics, with more premium places on efficient use of time.
- Changes in consumer behavior, with less on brand name and more on lowest prices.
- Technology improvements that provide greater convenience and more information than traditional retailing .

Overbuilding and Excess Capacity

With online retailing, constraints of time and space disappear. There

is no bricks and mortar storefront to worry about, no critical locations. This new way of retailing can severely affect companies that have invested in expansion and adding capacity. It is important to understand the trouble traditional retailers will face if online retailing takes off.

The 1980s was a period of overexpansion and turmoil for retailers. By the end of the decade, complaints about excessive retail space were being voiced. Profits were declining and control of operating expenses became a paramount management objective. Retailers reduced staff and minimized merchandising in order to enhance profits. Sales growth and market share development were given second priority behind profit enhancement.

In the 1990s, companies are under pressure to grow and produce profit. An important measurement of profit gains is gross margin per square foot. For many retailers, this number is either growing slowly or declining, partially reflecting a less favorable product mix and more competition. Inadequate productivity, both per worker and per unit of space, is also reducing profit margins. Overbuilding also resulted in a growing shortage of low-cost, entry-level workers for the retail industry. The shortage of entry level workers means that retailers are using undertrained workers who are less able to empathize with shopper needs-leading to a perception that retailers in general and shopping centers in particular are unable or unwilling to provide quality service.

Demographic Changes

Shopping patterns are beginning to change with the increase of time-strapped, two-career couples and the aging of America. Value and time management are the consumer concerns driving interest in online retailing. Recent retail data shows a decline in the amount of time. Americans are spending in shopping malls. The suggested reasons vary : time constraints, safety concerns, and growing frustration with the lack of courteous service and insufficient product information. Understanding the implications of time constraints on consumer shopping behavior is important as they portend the trends to come. For instance, Americans have openly embraced shopping channels like QVC and Home Shopping Network and retailers like CUC International.

Today's time-strapped shoppers have less time and want better values, fewer hassles, and more options. Today, a shopping trip requires a consumer to decide what he or the family needs, brave the traffic on the way to a store, hunt for parking, find and selects, brave the traffic on the way to a checkout, wait in line, pay for the items, sometimes bag them, and carry them back home. It can be a hassle and a lot of work, so most working professionals have learned to dread shopping trips. As technology improves, it may not be long before driving to the store gives way to online shopping with home delivery as provided by Peapod.

In contrast, there is a growing segment of the population for whom time constraints are less of a problem. The demographic outlook in the United States is for an increasing share of older shoppers (age 50 and above) who prefer shopping at stores rather than online. However, the product mix offered by many department stores and malls is increasingly out of touch with the aging population and does not reflect the shift in purchasing power. Also with the aging of the population, there is evidence to indicate a shift in consumer interest away from material goods and toward experiences, such as travel and recreation. In addition, as people get older, they tend to become more frugal.

Retailers will need to concentrate on value by offering new product mixes. By this we mean a product mix that includes not only merchandise but also bundles in entertainment and "recreational" shopping with movie theaters, restaurants, bookstores, libraries, and community meeting facilities. This sort of change is already occurring in bookstore design (such as Borders Bookstores and Barnes and Noble), which include a variety of facilities such as coffee shops. However, building shopping malls based on these new business models is a risky venture and requires huge investments.

Consumer Behaviour

Consumer behaviour is more volatile than ever before, and companies need new way of responding to consumer needs and satisfying demand. According to one survey, the typical consumer spent only four hours a month in a shopping mall in 1990 versus ten hours in 1985, and sales per square foot dropped. The Retailing-power centers, discount malls, discount stores, and catalog shopping-has become one solution for closely

monitoring consumer trends and reacting to them quickly. All of these alternatives have one thing in common: they provide consumers with a very large selection of producers priced with deep discounts.

Consumers are no longer as influenced by brand names as they used to be. The emergence of the value shopper is changing retailing. Today , the shopper is less willing to pay the premium for the brand name and much more attentive to quality and value. The decline in gross margins is the first evidence of the impact of that change, reflecting lower initial markups and more discriminating shoppers in that segment. Clearly, retailers that are focused on providing value-the best price, service, and selection-regardless of the brand name will be successful. The real differentiating characteristic for retailers will be in their ability to define what the broad or niche consumer segment is looking for, identifying characteristics of customers in ach target segment, and learning how to bundle products and package brands so that they become the preferred choice for online customers.

Technology Improvements in Electronic Retailing

Today, electronic retailing is still far from being a competitive threat to more traditional store retailing, but it is becoming increasingly attractive as technology and applications improve, and retailers gain experience.

Three dominant forms of electronic retailing channels are : television retailing, CD-ROM retailing, and online service-based retailing, in which we include Web-based retailing.

Television Retailing: The TV retail marketing and programming are divided into segments that are televised live, with a show host who presents the merchandise and conveys information relating to the product, including price, quality, features, and benefits. Show hosts engage callers in on -air discussions regarding the currently featured product or the caller's previous experience with the company's products. Viewers place orders for products by calling a toll-free telephone number. Generally, merchandise is delivered to customers within seven to ten business days of placing an order. The purchase item may be returned within thirty days for a full refund of the purchase price, including the original shipping and handling charges.

The success of television shopping is the result of the effective utilization of electronic media for capturing the power and influence of celebrity and the magic showmanship, and bringing them to bear on a sale. In its annual report, the Home Shopping Network states that a celebrity can debut a line of jewelry on HSN and sell more than $2 million in a single weekend.

CD-ROM -based Shopping: Relatively inexpensive to produce and distribute ($2 per disk), CD-ROMs represent a cost - effective alternative to traditional print catalogs. A key advantage is that they can be produced at a much lower cost than paper catalogs by spreading the cost among many retailers on a single CD.

The crucial business ideas behind catalogs is threefold: build name and brand recognition for the stores and manufacturers; help determine store expansion plans by using the catalog as a prospecting tool; and develop inventory control mechanisms that reduce excess capacity by creating alternative distribution avenues.

CD- ROM catalogs are basically a new twist on traditional print catalogs. A CD_ROM catalog has multimedia capability and can enable a merchant to add sound, photos, and full-motion video to a product presentation. An apparel merchant can, for example, present merchandise by showing a model walking down a runway. Furthermore, CD-ROMs can be interactive, enabling the customer to pick and choose which merchandise categories to view, or which full motion video to run. With digital technology bringing high-resolution graphics to computer screens, interactivity has become a cost -efficient, as well as visually superior, medium for showing products. The increase in the number of PCs with CD-ROM players is boosting this market.

However, there are several disadvantages to the medium, the most obvious being that not everyone has a CD-ROM drive. Consumers are not comfortable with this shopping method because the CD-ROM is a static medium, meaning that once a disc is created it cannot be updated, whereas online-based methods allow continuous updating. To address the static media criticism, the CD-ROM -based catalog business is undergoing major changes.

Online -based Shopping: The burgeoning online marketplace has enticed more and more retailers to offer their wares online. Online retailers can be divided into four distinct groups:

Retailers that operate off-line stores, getting their feet wet with online storefronts

Retailers such as catalogers who are concerned with the new Web-based methods of catalog retailing.

"New age" retailers that do not currently operate retail businesses, but they understand how this new medium can revolutionize shopping.

Manufacturers exploring the potential to go "direct to consumers."

Retailing via online services has been around for a while. Online service providers such as CompuServe and America Online (AOL), offer twenty four -hour access to their own shopping environments. These online malls can be very effective. For instance, when Home Shopping Network (HSN) launched its retail outlet on Prodigy in late 1994, subscribers purchased the entire inventory of cookware and jewelry in only a few days. Another example can be found in the music business, Tower Records. Tower jumped online in June 1995, when it put a store up on AOL. In December 1995, the Tower's AOL store registered almost $200,000 in sales, exceeding Tower's expectations in terms of sales.

More recently, retailers are increasingly looking toward the Web as a retail outlet because of its reach, constant innovation, and low cost. Numerous retailers are developing programs to deliver online shopping to Internet users twenty-four hours a day, seven days a week. Orders are shipped the next day, but can be processed as quickly as within fifteen minutes. Initially, retailing on the Web was more focused on marketing and less on order taking. However, as companies gain experience and learn from their mistakes, they are beginning to study consumer habits, define trends, purchase and develop products to fit a plan, support plans with merchandising ideas, and turn consumer statistics into long-term customer relationships.

The intriguing aspect of online retailing is the emergence of companies that only exist online, like The Electronic Newsstand, Amazon.com and E*Trade.



CHECK YOUR PROGRESS

Q.2 : What are the important factors affecting the retailing industry?

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8.5 E-COMMRCE APPLICATION IN RETAIL

Retailing involves selling products and services to consumers for their personal or family use. Department stores, discount stores and specialty stores like jewelers, toys are all examples of retail stores. Service providers, like dentists, hotels and hair salons and on-line stores, like Amazon.com, are also retailers.

Many businesses like Home Depot, are both wholesalers and retailers because they sell to consumers and building contractors.

Importance of retailing

As the final link between consumers and manufacturers, retailers are a vital part of the business world. Retailers add value to products by making it easier for manufactures to sell and consumers to buy. It would be very costly and time consuming for you to locate, contact and make a purchase from the manufacturer every time you wanted to buy a candy bar, a sweater or a bar of soap. Similarly, it would be very costly for the manufactures of these products to locate and distribute them to consumers individually. By bringing multitudes of manufacturers and consumers together at a single point, retailers make it possible for products to be sold, and, consequently, business to be done.

Retailers also provide services that make it less risky and more fun to buy products. They have salespeople on hand who can answer questions, may offer credit, and display products so that consumers know what is available and can see it before buying. In addition, retailers may provide many extra services, from personal shopping to gift wrapping to delivery, that increase the value of products and services to consumers.

Role of E-commerce in Retailing

Advances in technology, like the Internet, have helped make retailing an even more challenging and exciting field in recent years. The nature of the business and the way retailing is done are currently undergoing fundamental changes. However, retailing in some form will always be necessary. For example, even though the Internet is beginning to make it possible for manufacturers to sell directly to consumers, the very vastness of cyberspace will still make it very difficult for a consumer to purchase every product he or she uses directly. On-line retailers, like Amazon.com, bring together assortments of products for consumers to buy in the same way that bricks -and - mortar retailers do.

In addition, traditional retailers with physical stores will continue to be necessary. Of course, retailers who offer personal services, like hair styling, will need to have face-to-face interaction with the consumer. But even with products, consumers often want to see, touch and try them before they buy. Or, they may want products immediately and won't want to wait for them to be shipped. Also, and perhaps most importantly, in many cases the experience of visiting the retailer is an important part of the purchase. Everything that the retailer can do to make the shopping experience pleasurable and fun can help ensure that customers come back.



CHECK YOUR PROGRESS

Q.3 : Explain the role of E-commerce in retailing.

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8.6 E-COMMERCE APPLICATION IN SERVICE SECTOR

The service sector or the service industry is one of the three main industrial categories of a developed economy, the others being the secondary industry (manufacturing and primary goods production such as agriculture), and primary industry (extraction such as mining and fishing).

The tertiary sector of industry involves the provision of services to other businesses as well as final consumers. Services may involve the transport, distribution and sale of goods from producer to a consumer as may happen in wholesaling and retailing, or may involve the provision of a service, such as in pest control or entertainment. The goods may be transformed in the process of providing the service, as happens in the restaurant industry. However, the focus is on people interacting with people and serving the customer rather than transforming physical goods.

The services sector consists of the "soft" parts of the economy such as insurance, tourism, banking, retail and education.

Public utilities are often considered part of the tertiary sector as they provide services to people, while creating the utility's infrastructure is often considered part of the secondary sector, even though the same business may be involved in both aspects of the operation.

Issues for Service Providers

Service providers face obstacles selling services that goods-sellers rarely face. Services are not tangible; making it difficult for potential customers to understand what they will receive and what value it will hold for them. Indeed some, such as consulting and investment services, offer no guarantees of the value for price paid.

Role of E-commerce in Service Sector

As discussed above e-commerce. can be implemented in service sector for gaining competitive advantage by providing strategies for differentiation and cost leadership and cost leadership and customer satisfaction.

E-commerce will improve the speed of transactions , reduce management expenditure , increases competitiveness and helpful in the banking , insurance and financial sectors , and real estate, construction , telecom, tourism , postal and logistics services.



CHECK YOUR PROGRESS

Q.4 : Discuss the application of E-commerce in service sectors.

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8.7 LET US SUM UP

In this unit we have discussed the following aspects-

- Issues in developing a business model.
- Changing retail industry dynamics.
- Importance of retailing
- Role of E-commerce in Retailing
- The service sector or the service industry is one of the three main industrial categories of a developed economy, the others being the secondary industry and primary industry .
- Issues for Service Providers
- Role of E-commerce in service sector



8.8 FURTHER READING

1. E-Business and E-commerce for manager's, - Harvey M. Deitel, Paul J. Deitel, Kate Steinbuhler, Pearson.
2. E-commerce, An Indian Perspective, - P. T. Hoseph, S. J. PHI.
3. Electronic Commerce - Security, Risk management and Control, Greenstein and Feinman, Tata Megraw - Hill.

8.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: The main issues in developing a business model are -

- Product/content issues: What kinds of products are suited for online retailing?
- Software interface issues: What kind of features will constitute an effective interface? What features make it easy to find and select items for online purchase?
- Process issues: What are the specific steps in the shopping process from a consumer's perspective? What kind of processes should companies develop to fulfill orders efficiently?
- Pricing issues: How much will consumers be willing to pay for convenience?
- Payment issues: What payment methods would consumers use for online purchases?
- Market penetration issues: Would an online channel be popular with consumer? How long will such a system take to attract a critical mass and become profitable?

Ans to Q2: Important factors affecting the retailing industry dynamics are:

- Overbuilding and excess supply.
- Changes in consumer demographics, with more premium places on efficient use of time.
- Changes in consumer behavior, with less on brand name and more on lowest prices.
- Technology improvements that provide greater convenience and more information than traditional retailing.

Ans to Q3: Advances in technology, like the Internet, have helped make retailing an even more challenging and exciting field in recent years. The nature of the business and the way retailing is done are currently undergoing fundamental changes. However, retailing in some from

will always be necessary. For example, even though the Internet is beginning to make it possible for manufacturers to sell directly to consumers, the very vastness of cyberspace will still make it very difficult for a consumer to purchase every product he or she uses directly. On-line retailers, like Amazon.com, bring together assortments of products for consumers to buy in the same way that bricks -and - mortar retailers do.

In addition, traditional retailers with physical stores will continue to be necessary. Of course, retailers who offer personal services, like hair styling, will need to have face-to-face interaction with the consumer. But even with products, consumers often want to see, touch and try them before they buy. Or, they may want products immediately and won't want to wait for them to be shipped. Also, and perhaps most importantly, in many cases the experience of visiting the retailer is an important part of the purchase. Everything that the retailer can do to make the shopping experience pleasurable and fun can help ensure that customers come back.

Ans to Q4: The service sector or the service industry is one of the three main industrial categories of a developed economy, the others being the secondary industry (manufacturing and primary goods production such as agriculture), and primary industry (extraction such as mining and fishing).

The tertiary sector of industry involves the provision of services to other businesses as well as final consumers. Services may involve the transport, distribution and sale of goods from producer to a consumer as may happen in wholesaling and retailing, or may involve the provision of a service, such as in pest control or entertainment. The goods may be transformed in the process of providing the service, as happens in the restaurant industry. However the focus is on people interacting with people and serving the customer rather than transforming physical goods.

The service sector consists of the "soft" parts of the economy such as insurance, tourism, banking, retail and education.

Public utilities are often considered part of the tertiary sector as they provide services to people, while creating the utility's infrastructure is often considered part of the secondary sector, even though the same business may be involved in both aspects of the operation.



8.10 MODEL QUESTIONS

Q.1. Discuss the importance of e- commerce for service providers.

Q.2. Discuss the role of e-commerce in service sector?

Q.3. Explain the application of e- commerce in retailing.

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UNIT 9: VIRTUAL EXISTENCE

UNIT STRUCTURE

9.1 Learning Objectives

9.2 Introduction

9.3 Concept of Virtual Existence

9.4 Advantage and Disadvantages of Virtual Organization

9.5 Working of Virtual Organization

9.6 Let Us Sum Up

9.7 Further Reading

9.8 Answers to Check Your Progress

9.9 Model Questions

9.1 LEARNING OBJECTIVES

After going through this unit you will be to-

- explain the concept of virtual existence
- discuss the advantages and disadvantages of virtual organization
- discuss the working of virtual organization
- define work force and Work Space in relation to virtual organization

9.2 INTRODUCTION

Office represents the clerical paper work carried out at any place. It is the part of an organization which helps in carrying out the basic managerial functions on paper. Planning, organizing, coordinating and controlling organization operations are such functions of management that need to be made done on paper first before their actual implementation on site/work. Such things on paper can also prove to be a source of enormous experience. Thus, the basic purpose of an office is to provide services in the form of providing communication and records. Through these services the office helps manages to plan, monitor, coordinate and appraise the operations

that are central to any organization.

9.3 CONCEPT OF VIRTUAL EXISTENCE

The concept virtual existence has come up with office automation. The concept emerged in late 1970s when micro computers became economic. By this time, micro computers were available at affordable prices which made possible for individuals to work even from their homes. In the early year the term teleprocessing was used to explain this because it denoted that the employees of an office communicated electronically. This was first applied to the computer-based workers like software developers, programmers etc. who could do their work even when at home. Later the term also came to be used for all those whose physical presence in office is not essential. For example, marketing researchers, sales forces etc.

Office automation has led to the development of the concept of virtual office. Virtual office, as the name suggests, is devoid of physical space and facilities. Interaction is done through communication tools like electronic mail, cellular phone, laptop computer, fax machine, video/audio conferencing etc. Wherever these are available office work can be performed. May it be home, car, airport, restaurant/club etc. There are various advantages of virtual office like, reduced facility cost, reduced equipment cost, emphasis on formal communication, reduced work stoppages etc. But virtual office is not free from disadvantages like lack of emotional attachment with the work-place, the employees feel psychologically cut-off from the routine work of the office and they may also carry along family tensions and personal problems during work as they do not leave their homes physically.

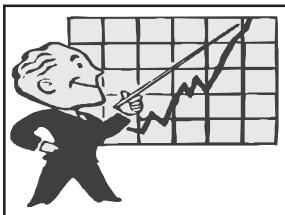
Today most large national banks, many regional banks and even smaller banks and credit unions offer some form of online banking, variously known as PC banking, home banking, electronic banking or Internet Banking. Those that do are sometimes referred to as "brick-to-click" banks, both to distinguish them from brick-and-mortar banks that have yet to offer online banking, as well as from online or "virtual" banks that have no physical branches or tellers whatsoever.

The challenge for the banking industry has been to design this new service channel in such a way that its customers will readily learn to use and trust it. After all, banks have spent generations earning our trust; they aren't about to risk that on a website that is frustrating, confusing or less than secure.

Most of the large banks now offer fully secure, fully functional online banking for free or for a small fee. Some smaller banks offer limited access or functionality; for instance, one may be able to view one's account balance and history but not initiate transactions online. As more banks succeed online and more customers use their sites, fully functional online banking likely will become as commonplace as automated teller machines.

The major advantage of such banks is that they pass the money they save on overhead like buildings and tellers along to one in the form of higher yields, lower fees and more generous account thresholds.

The major advantage of virtual banks revolves around ATMs. Because they have no ATM machines, virtual banks typically charge the same surcharge that one's brick-and-mortar bank would if one use another bank's automated teller. Likewise, many virtual banks won't accept deposits via ATM; one will have to either deposit the check by mail or transfer money from another account.



CHECK YOUR PROGRESS

Q.1 : What is meant by virtual existence?

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9.4 ADVANTAGES AND DISADVANTAGES OF VIRTUAL ORGANIZATION

Advantages of Virtual Organization

There are certain advantages of virtual office that have helped them gain popularity all over the world. A few important advantages of the same

are discussed as below:-

(1) **Fast and timely work :** Since it is possible to carry out work even at home, with the help of computers, the employees now can work even when they are at home or are unable to go to office due to some external reasons like strike of bus-service, breaking down of the vehicle, illness etc. Sometimes, on a particular day, office-work gets hundred due to reasons like power failure, emergency works, board meetings, annual day, celebrations, holidays etc. In spite of all these, the work can be continued. All this leads to fast working and timely work.

(2) **Reduction in set-up cost :** An office traditionally requires cabins , good quality furniture , files, peons , drinking water arrangement , toilets , light/power arrangements reception , receptionist and so on . All this involves sunk cost, that is, the cost that goes but does not give anything in return. Virtual office system reduces this set-up cost. It however, requires the development of local area network through which the employees are connected which is more relevant, as far as knowledge workers are concerned.

(3) **Orderly flow of communication:** Through virtual office it is easily possible to maintain an orderly flow of communication as it enjoys all the facilities for the same. The time and place constraints are almost non -existent which ensures the orderly flow of relevant information. As against this, a lot of time is wasted in informal communication among the employees in a formal office set-up without any exchange of ideas and thoughts.

(4) **Worker-friendly:** Virtual offices are worker-friendly. There are people who prefer to work or rather have the capacity to work early morning or late night. Virtual office makes it possible for them to do so resulting in increased efficiency and productivity. Sometimes on a particular day the person may be willing to work for long hours while on any other day he may be feeling low on work. Virtual office presents an answer to all these and therefore are worker-friendly.

(5) **Social and Family Interaction:** virtual office helps the employees

to save a lot of time because of absence of physical commuting which otherwise consumes a lot of employees' time. This time can be utilized in social and family gatherings etc. This can further improve their efficiency.

(6) Large Experience can be Used: Virtual office enables the organization to use the experience of the elderly people who otherwise are not in a position to come to the office physically daily. Other handicapped people can also work through virtual office.

(7) An Answer to Over burdened Roads of Metro-Cities: Virtual office poses to put forward a solution of the overloaded roads of metro-cities in particular during the peak 'office hours'. A city can plan to set office timing at different hours of the day without much disturbance to actual work.

Disadvantages of Virtual Organization

Despite of several advantages, virtual office system certainly has certain disadvantages. The important ones are described as below:

(1) Lack of Belongingness: The employees do not feel any sense of belongingness towards the office. They do not feel any emotional bond with their team-mates or colleagues. This may result into increased employee turnover rates.

(2) Lack of Working Environment: The employees do not get a proper work environment through virtual office which is indispensible for the workers. This may negatively influence their productive efficiency.

(3) Psychological Fears: Employees may feel fearful. In place of jobs, there will be part-time and temporary work situations. Organizations will be transformed from a structure built of jobs into a field of work to be done. And these organizations will be essentially made up of hired guns-contingent employees (temporaries, part timers, consultants and contract workers) who will join protect teams created to complete a specific task. When that is finished, the teams will disband. People work on more than one team at a time, keeping irregular hours and may be never meeting their co-workers face -to-face. Computers, cellular phones modems and the likes will allow

people to work for multiple employers at the same time in locations throughout the world. "May be not in next 25 years but certainly in a few more years than that, virtual offices shall become common in India as well, in spite of various disadvantages. To overcome the said disadvantages many organizations using virtual office systems in U.S.A. for example IBM, U.S.S.; conduct seminars on regular basis on the themes, likes 'how to promote team atmosphere among virtual office workers', how to remain in touch with peers, managers and clients etc."

On the basis of the above, it can be concluded that office automation has led to the development of virtual office concept, Virtual office, as the name suggests, is devoid of physical space and facilities. Interaction is done through communication tools like electronic mail. Cellular phone, laptop computer, fax machine, video/audio conferencing etc. Wherever these are available office work can be performed. May it be home, car, airport, restaurant/club etc. there are various advantages of virtual office like, reduced facility cost, reduced equipment cost, emphasis on formal communication, reduced work stoppages etc. But virtual office is not free from disadvantages like lack of emotional attachment with the work-place, the employees feel psychologically cut-off from the routine work of the office and they may also carry along family tensions and personal problems during work as they do not leave their homes physically.



CHECK YOUR PROGRESS

Q.2 : State two advantages and two disadvantages of virtual organization.

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9.5 WORKING OF VIRTUAL ORGANIZATION

A virtual office works just like a physical office with a different frame of physical arrangement of room, table, chair, windows, doors and other

facilities. The virtual office is equipped with communication tools like a computer with e-mail/internet, cellular phone, voice mail system, laptop, fax machine, audio-video conferencing system etc. At any place like home, car, airport, restaurants etc, these facilities are available, an employee can carry out his work, either on his own or even by communicating with his counterparts or colleagues.

In the modern business world work has expanded unlimitedly to the whole world. The amount of work has also increased. In the event of improved technology, the quantum of production has improved many times. This has increased the emphasis on the use of information technology. Virtual offices shall become the way of working in years to come. As opined by Verespej, an expert on information technology application, in the next twenty five years or so, very few people will have jobs as we have today.

Measures for Effective Virtual Office

Now, when it is certain that virtual office systems shall inevitably come into existence in the near future, it is necessary to identify a few measures to make virtual office system more and more effective. For this purpose, two broad perspectives are -

A. Physical Measures: These include providing various resources so that better management can be achieved. For managing virtual offices in a better way, following physical measure:

- **Providing Quality Hardware and Software Resources:** The success of virtual office depends upon the computer hardware and software resources available . The employing organization should provide these amply.
- Access to information: The employer or organization should provide adequate resources so that information can be easily accessed whenever required because they feel cut-off from the every-day activities of the office being away from the office .
- **Personal tensions :** In virtual office system , since the environment does not change, personal family and other such tensions persist . psychologically , they still feel that they are at

home , therefore they carry their personal , family tensions along during work . This may reduce their efficiency .

- Proper base office : For virtual offices to work successfully it is essential that the organization has a well-managed and maintained base office . Base office is for forwarding phone calls to concerned employees at virtual office , receiving the phone calls in the absence of the concerned employee etc. Base office is also important for visitors .
- Arrangement of conference calls : A virtual office cannot be effective in the absence of conference call arrangements . A conference call is the one that enables more than two people to participate in the conversation at the same time . This helps in exchanging their views and ideas among themselves , just like they earlier did in physical office .
- Proper follow-up of routine work :Virtual office can work effectively only when routine work is duly followed-up by the person in charge . The time specification for a specific work must be fully followed .
- Regular performance appraisal : Performance appraisal must be done as a routine in an organization where virtual office system is used . This helps in quantifying work performance of each individual . On the basis of this more clear specific and timely work can be expected from the workers.

B. Other measures: Other than the physical measures certain managerial, organizational and psychological measures must also be taken in order to make virtual office system successful . For example conducting workshops on "how to promote team atmosphere in virtual office", "how to remain in touch with peers , managers and clients ," etc. This help in overcoming lack of belongingness and psychological fear among the workers working in virtual office. Informal meetings say once in a month may also help in creating team working for common Endeavour.

Virtual office system can be made effective by providing proper hardware and software resources, providing easy access to information through internet, arrangement conference calls, conducing follow up of routine work, job evaluation, performance appraisal etc.

A virtual workspace is a workspace that is not located in any one physical space. It is usually in a network of several workplaces technologically connected (via a private network or the internet) without regard to geographic boundaries. Employees are thus able to interact in a collaborative working environment regardless of where they are located .A virtual workspace integrates hardware, people and online processes .

As information technology began to play a greater role in the daily operations of organizations, virtual workspace developed as an augmentation or alternative to traditional work environments of rooms cubicles and office buildings.

Types of work space:-

1. Telecommuting - The availability and use of communications technologies , such as the internet, to work in an offsite location.
2. Hot desking- Employee do not have individual desks but are rather each day allocated to a desk where they can access technology services including the internet, e mail and computer network files . This is similar to "hotel ling" recognizing that employees spend more time at clients offices than at the employers office, they are not assigned a permanent desk.
3. Virtual team - Employees collaborate by working closely together and in regular contact, although physically located in different parts of the world.

There are several factors that drive the interest in using virtual workspace -

Office space and its cost - Office space has become a major expense for many organizations (and using video technology on platforms such as skype (at reduced cost) can be a direct substitute of meeting face to face) . One response has been to reduce the amount of space each

employee occupies . Another is to increase the flexibility of the office's layout and design . It is not easy to make the most of these approaches and keep employees happy unless flexible work practices are also used .

Demographic change - There are more woman in the workforce more employees of other nationalities , increased participation from indigenous people and the average age of employees is increasing . These trends are forcing employers to rethink how they employ and manage staff and how they respond to employee interest and demands .

Fuel and energy costs - The cost of the energy needed to commute ,live and work are increasing rapidly . Urban forms are expected to change as a result .

Virtual work place are advantageous in an information age where technology is expanding rapidly and consumer needs are being met from around the world . A virtual workspace enables individuals to work from any place in the world at any time . This is convenient not only for the employee, but for the consumer as well .

Decreasing cost as well as increasing efficiency , due to the single system is an advantage . A virtual workspace is easier for employees because it often reduces business travel , consolidates services and assists in the communication process

A virtual workforce is to make it easier for employees to work from home or any other remote location- across the country or even around the world .

Most virtual technologies are "cloud-base" services . This means that instead of relying on your own computer or server , the technology provider stores your data on servers that may be located anywhere .

Cloud-based services are familiar with include Google mail and Google calendar . As long as you have access to a web browser, these servicer will work in any location on any computer provided the user knows the correct password .

For a virtual workforce , consider the technologies that you'll need . In most cases you'll be able to find a service that costs very little .



CHECK YOUR PROGRESS

Q.3 : State two physical measures for effective virtual office.

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Q.4 : What is meant by work force in virtual organization?

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9.6 LET US SUM UP

In this unit we have discussed the following aspects -

- Office automation has led to the development of the concept of virtual office.
- Virtual office is devoid of physical space and facilities. Interaction is done through communication tools like electronic mail, cellular phone, laptop computer, fax machine, video/audio conferencing etc.
- The advantages of virtual organization are - Fast and timely work, Reduction in set-up cost, Orderly flow of communication etc.
- The advantage and disadvantages of virtual organization.
- The working of virtual organization.
- The work force and work space in virtual organization.



9.7 FURTHER READING

1. E-Business and E-commerce for manager's, - Harvey M. Deitel, Paul J. Deitel, Kate Steinbuhler, Pearson.
2. E-commerce, An Indian Perspective, - P. T. Hoseph, S. J. PHI.

3. Electronic Commerce - Security, Risk management and Control, Greenstein and Feinman, Tata Megraw - Hill.

9.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: The concept virtual existence has come up with office automation. The concept emerged in late 1970s when micro computers became economic. By this time, micro computers were available at affordable prices which made possible for individuals to work even from their homes. In the early year the term teleprocessing was used to explain this because it denoted that the employees of an office communicated electronically .This was first applied to the computer-based workers like software developers, programmers etc. who could do their work even when at home . Later the term also came to used for all those whose physical presence in office is not essential. For example, marketing researchers, sales forces etc.



Ans to Q2: The advantages are-

- Fast and timely work
- Reduction in set-up cost

The disadvantages are-

- Lack of belongingness
- Lack of working environment

Ans to Q3:

- Providing Quality Hardware and Software Resources
- Access to information

Ans to Q4: A virtual workforce is to make it easier for employees to work from home or any other remote location- across the country or even around the world .

Most virtual technologies are "cloud-base" services . This means that instead of relying on your own computer or server , the technology provider stores your data on servers that may be located

anywhere . Cloud-based services are familiar with include Google mail and Google calendar . As long as you have access to a web browser, these servicer will work in any location on any computer provided the user knows the correct password .

For a virtual workforce , consider the technologies that you'll need . In most cases you'll be able to find a service that costs very little



9.9 MODEL QUESTIONS

Q.1. Explain the concept virtual existence.

Q.2. What are the disadvantages of virtual organization?

Q.3. Write short note on:

(i) Work zone

(ii) Work space

(iii) Staff-less organization

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UNIT 10: SECURITY IN E-COMMERCE

UNIT STRUCTURE

10.1 Learning Objectives

10.2 Introduction

10.3 E-commerce Security Issues

10.4 Risks Involved in e-commerce

10.5 Protecting e-commerce System

10.6 Common e-commerce Security Tools

- 10.6.1 Authentication
- 10.6.2 Access control
- 10.6.3 Firewall
- 10.6.4 Preventing Problems from Viruses, Trojans and Worms
- 10.6.5 Digital Identity and Digital Signature

10.7 Biometric

10.8 Client-Server Network Security

10.9 Data and Message Security

- 10.9.1 Encryption (Secret key ,Public Key)
- 10.9.2 Digital Signature (Electronic signature)

10.10 Let Us Sum Up

10.11 Further Reading

10.12 Answers to Check Your Progress

10.13 Model Questions

10.1 LEARNING OBJECTIVES

After going through this unit you will be able to -

- explain the e-commerce security issues
- explain the risks involved in e-commerce
- discuss the protecting system in e-commerce
- discuss the common e-commerce security tools
- explain the process of preventing from viruses, trojans and worms
- define digital identity and digital signature

10.2 INTRODUCTION

Electronic commerce may include any computer mediated business process, but a common usage is to describe commerce taking place using the World Wide Web as an enabling transport. The web is the way to do business for many reasons. The, ubiquitous clients, the wide availability of access, and consistent interfaces to many different platforms are among the reasons to choose web solutions for many problems. In addition, the limited nature of the HTTP protocol makes security issues simpler. However, any transaction-taking place across the public Internet is open to wide variety of security problems.

One of the critical success factors of e-commerce is its security. Without a great degree of confidence by the customers that credit card numbers and other extremely sensitive personal information will be kept secure, e-commerce will simply not work. However, the successful functioning of e-commerce security depends on a complex interrelationship between several components, including the applications development platforms, database management systems, systems software and network infrastructure.

10.3 E-COMMERCE SECURITY ISSUES

E-commerce systems are based upon Internet use, which provides open and easy communications on a global basis. However, because the Internet is unregulated, unmanaged and uncontrolled, it introduces a wide range of risks and threats to the systems operating on it.

The use of the Internet means that your internal IT and e-commerce systems are potentially accessible by anyone, irrespective of their location. The following points outline the security issues related to e-commerce:

- Access control: If access control is properly implemented, many other security problems, like lack of privacy, will either be eliminated or mitigated. Access control ensures only those that legitimately require access to resources are given access and those without valid access to resources. Various types of threats exist for access

control. For example, being able physically to enter a building or having access to network equipment is one example of a threat.

- Privacy: Privacy ensures that only authorized parties can access information in any system. The information should also not be distributed to parties that should not receive it. Issues related to privacy can be considered as a subset of issues related to access control.

  Protection of privacy requires access control, however access control deals with the larger picture. Due to this, the threats to privacy are similar to that of access control. Integrity ensures that only authorized parties make changes to the documents transmitted over the network. Lack of integrity of the system can be devastating for e-commerce. While the threats to integrity are similar to the threats to access, being a threat to integrity is possible only when one has access at a level consistent with someone having the rights to alter a document. For example, if a customer places an order, and someone can access the system as the customer, they may be able to alter the contents of the order placed.

- Authentication: Authentication ensures that the origin of an electronic message is correctly identified. This means having the capability to determine who sent the message and from where or which machine. Without proper authentication, it will be impossible to know who actually placed an order and whether the order placed is genuine or not.

- Non-repudiation: Non-repudiation is closely related to authentication and this ensures the sender cannot deny sending a particular message and the receiver cannot deny receiving a message. If this happens infrequently, it may not significantly harm E-commerce, however, on a large scale this can be devastating. For example, if many customers receive goods and then deny placing an order, the shipping, handling and associated costs with the order can be significant for the company processing the orders.

- Availability: Availability ensures that the required systems are available when needed. For an e-commerce site this means that the customer order systems are available all the time. Two major threats to availability problems are virus attacks and denial of service.

One complicating factor for any e-commerce venture is security for customer information, such as credit card numbers and personal data, that most customers do not wish to have shared. Hardly a month goes by without media reports of security breaches over the Internet. Internal security problems, as well as hackers, can plague firms. Guarantees, seal of approval, testimonials, etc., can help ease consumer worries since most sites lack track records.

Transaction security has kept many customers from purchasing products on the Internet. Much resistance has come from privacy issues such as giving credit card number and personal information. There are continual reminders of how unsafe these practices can be, even though "secure" software programs have been developed and continue to become more protective. Foolproof systems may never be developed and, therefore, the customer is left to weigh the potential cost of privacy with the benefits of conducting business over the Internet.

10.4 RISKS INVOLVED IN E-COMMERCE

Some of the more common threats that hackers pose to e-commerce systems include:

- Carrying out denial-of - service (DoS) attacks that stop access to authorized users of a website, so that the site is forced to offer a reduced level of service or, in some cases, cease operation completely
- Gaining access to sensitive data such as price lists, catalogues and valuable intellectual property, and altering, destroying or copying it.
- Altering your website, thereby damaging your image or directing your customers, to another site

- Gaining access to financial information about your business or your customers with a view to perpetrating fraud
- Using viruses to corrupt your business data

Impact upon the business

All of these risks can have a significant impact upon a business running an E-commerce service. The potential business implications of a security incident including the following;

- Direct financial loss as a consequence of fraud or litigation.
- Consequential loss as a result of unwelcome publicity.
- Criminal charges if you are found to be in breach of the Data Protection or Computer Misuse Acts or other regulation on e-commerce.
- Loss of market share if customer confidence is affected by a denial-of-service attack, or other.

The image presented by your business, together with the brands under which you trade, are valuable assets. It is important to recognize that the use of e-commerce creates new ways for both image and brands to be attacked.

Risks from Viruses, Trojans and Worms

Viruses, Trojan horses and worms are all computer programs that can infect computers.

Viruses and worms spread across computers and networks by making copies of themselves, usually without the knowledge of the computer user.

A Trojan horse is a program that appears to be legitimate but actually contains another program or block of undesired malicious, destructive code, disguised and hidden in a block of desirable code. Trojans can be used to infect a computer with a virus.

A back-door Trojan is a program that allows a remote user or hacker to bypass the normal access controls of a computer and gives them unauthorized control over it. Typically a virus is used to place the back-door Trojan onto a computer, and once the computer is online, the person who sent the Trojan can run programs on the infected computer, access personal files, and modify and upload files.

RISKS TO E-COMMERCE SYSTEMS

While some viruses are merely irritants, others can have extremely harmful effects. Some of the threats that they pose to e-commerce systems include:

- Corrupting or deleting data on the hard disk of your server
- Stealing confidential data by enabling hackers to record user keystrokes
- Enable hackers to hijack your system and use it for their own purposes
- Using your computer for malicious purposes, such as carrying out a denial-of-service (DoS) attack on another website
- Harming customer and trading partner relationships by forwarding viruses to them from your own system.

How do viruses spread?

Viruses are able to infect computers via a number of different routes. These include via:

- CDs and floppy disks containing infected documents
- Emails containing infected attachments
- Internet worms that exploit holes in your system's operating system when you are connected to the Internet.

Spyware

Spyware is software that is placed on your computer when you visit certain websites. It is used to secretly gather information about your usage and sends it back to advertisers or other interested parties. In addition to tracking your system use, it can also slow down or crash your computer.

10.5 PROTECTING E-COMMERCE SYSTEM

Securing your E-commerce System

As the use of Internet continues to grow, websites are assuming greater importance as the public face of business. Furthermore, the revenues generated by e-commerce systems mean that organizations are becoming ever more reliant upon them as core elements of their business.

With this high level of dependency upon the services provided by e-commerce systems, it is essential that they are protected from the threats posed by hackers, viruses, fraud and denial-of-service (DoS) attacks.

Identifying e-commerce Threats and Vulnerabilities

It is important that you understand the risks facing your e-commerce system, and the potential impact should any security incident arise.

What are the threats?

Threats to e-commerce systems can be either malicious or accidental. The procedures and controls you put in place to protect your site should help minimize both.

Malicious threats could include:

- Hackers attempting to penetrate a system to read or alter sensitive data
- Burglars stealing a server or laptop that has unprotected sensitive data on its disk
- Imposters masquerading as legitimate users and even creating a website similar to yours
- Authorized users downloading a web page or receiving an email with hidden active content that attacks your systems or sends sensitive information to unauthorized people

You should consider potential threats to sensitive information from three angles:

- Where (or who) are potential sources of threats?
- What level of expertise is the hacker likely to possess? How much effort are they likely to expend in attempting to breach your security?
- What facilities and tools are available to them?

The real threat may not be the most obvious one. Attacks from authorized users (such as a disaffected employee or partner) are far more common than attacks by hackers.

Risk Assessment

A risk assessment can be carried out to provide an organization with a clear understanding of the risks facing its e-commerce system and

associated business processes, and the potential impact if a security incident arises.

A key part of a risk assessment is defining the business' information access requirements. This will cover the rules of access for different groups of users. For example, different rules may apply for employees, consultants, managed service providers, suppliers, customers, auditors, government agencies and so on.

Any analysis should also take account of how electronic transactions are verified how do you know that an order has actually come from a known customer? Where contracts are exchanged electronically, who can sign them and how can it be proved which is the signed version?

10.6 COMMON E-COMMERCE SECURITY TOOLS

You should introduce sufficient security controls to reduce risk to e-commerce systems. However these controls should not be so restrictive that they damage the employees' performance.

Some of the common security controls are listed below.

10.6.1 Authentication

There are several techniques that can identify and verify someone seeking to access an e-commerce system. These include:

- A user name and password combination, where the password can vary in length and include numbers and characters.
- "Two-factor" authentication requiring someone the user has (e.g. an authentication token) and something the user knows (e.g. a personal identification number).
- A digital certificate that enables authentication through the use of an individual's unique signing key.
- A person's unique physical attribute, referred to as a biometric. This can range from a fingerprint or iris scan, through to retina or facial-feature recognition.

10.6.2 Access Control

This restricts different classes of users to subsets of information and ensures that they can only access data and services for which they have been authorized. This include using:

- Network restrictions to prevent access to other computer systems and networks
- Application controls to ensure individuals are limited in the data or service they can access
- Changes to access privileges must be controlled to prevent users retaining them if they transfer between departments or leave the business.

10.6.3 FIREWALL

Firewall is a hardware or software security device that filters information passing between internal and external networks. It controls access to the Internet by internal users, preventing outside parties from gaining access to systems and information on the internal network. A firewall can be applied at the network level, to provide protection for multiple workstations or internal networks, or at the personal level where it is installed on an individual PC.

A firewall typically takes one of two forms:

(i) Software firewall - specialized software running on an individual computer, or

(ii) Network firewall - a dedicated device designed to protect one or more computers

Both types of firewall allow the user to define access policies for inbound connections to the computers they are protecting. Many also provide the ability to control what services (ports) the protected computers are able to access on the Internet (outbound access). Most firewall intended for home use come with pre-configured security policies from which the user chooses, and some allow the user to customize these policies for their specific needs.

Types of firewalls

There are three basic types of firewalls depending on

1. Whether the communication is being done between a single node and the network, or between two or more networks
2. Whether the communication is intercepted at the network layer, or at the application layer
3. Whether the communication state is being tracked at the firewall or not

With regard to the scope of filtered communication there exist:

- Personal firewalls, a software application, which normally filters traffic entering, or leaving a single computer.
- Network firewalls, normally running on a dedicated network device or computer positioned on the boundary of two or more networks. Such a firewall filters all traffic entering or leaving the connected networks.

10.6.4 PREVENTING PROBLEMS FROM VIRUSES, TROJANS AND WORMS

Anti-virus software should be used to protect against viruses. It can detect viruses, prevent access to infected files and quarantine any infected files.

Anti-virus Software

There are different types of anti-virus software:

- Virus scanners - must be updated regularly, usually by connecting to the supplier's website, in order to recognize new viruses.
- Heuristic software- detects viruses by applying general rules about what viruses look like. White it does not require frequent updates, this software can be prone to giving false alarms.

The threat of virus infection can be minimized by:

- Using a virus checker on your Internet connection to trap viruses both entering and leaving the business' IT systems.

- Running virus checkers on servers to trap any viruses that have managed to have managed to evade the above check.
- Running individual virus checker on users' PCs to ensure that they have not downloaded a virus directly, or inadvertently introduced one via a CD or floppy disk.

Other Methods of Preventing Viruses

Other ways of preventing of viruses include:

- Installing software patches provided by the supplier of your operating system to close security loopholes that could be exploited by viruses
- Using a firewall to prevent unauthorized access to your network
- Avoiding download of unauthorized programs and documents from the Internet and ensuring your staff adhere to this policy

Your systems may still become infected even if you follow the above guidelines. Make regular back-ups of your data and software so that you can replace infected files with clean copies.

Virus Alerting Services

Consider subscribing to a service of supplier who will provide virus alerts for you.

Some are available on a paid-for basis, while others are provided by suppliers of anti-virus software to their customers.

Spyware

There is software available that scans your systems and detects known spyware programs. Spyware can then be removed or quarantined. As with anti-virus software, it is important to keep this software up-to-date.

10.6.5 Digital Identity and Digital Signature

Digital entity is the electronic representation of a real-world entity. The term is usually taken to mean the online equivalent of an individual human being, which participates in electronic transactions on behalf

of the person in question. However a broader definition also assigns digital identities to organizations, companies and even individual electronic devices. Various complex questions of privacy, ownership and security surround the issue of digital identity.

Digital identity refers to the aspect of digital technology that is concerned with the mediation of people's experience of their own identity and the identity of other people and things.

Digital Identity is a safe personal web platform that gives the individual the power to control how they interact with the Internet and share their personal information. Each individual is assigned a personal web address that functions as a master key to all his or her online communication. Through a number of practical tools such as online business cards, CV, favourites, personal messages, access control etc the individual creates and have full control of their online information. With Digital Identity each individual becomes an integrated part of the Internet, so other websites, search engines and applications automatically can interact with the online identity.

The basis of Digital Identity

- …is the online presence of an individual or business…gives access to online services -authentication
- …defines the level of access to online services-authorization
- …is a repository of information for use by the subscriber, for the subscriber…is the first point of all online communications.

10.7 BIOMETRIC

Biometrics refers to the automatic identification of a person based on his/her physiological or behavioral characteristics. Examples of physical (or physiological or biometric) characteristics include fingerprints, eye retinas and irises, facial patterns and hand measurements, while examples of mostly behavioral characteristics include signature, gait and typing patterns.

This method of identification offers several advantages over traditional methods involving ID cards (tokens) or PIN numbers (passwords) for various reasons:

(i) The person to be identified is required to be physically present at the point-of-identification;

(ii) Identification based on biometric techniques obviates the need to remember a password or carry a token. With the increased integration of computers and Internet into our everyday lives, it is necessary to protect sensitive and personal data. By replacing PINs (or using biometrics in addition to PINs), biometric techniques can potentially prevent unauthorized access to ATMs, cellular phones, laptops, and computer networks. Unlike biometric traits, PINs or passwords may be forgotten, and tokens like passwords and driver's licenses may be forged, stolen, or lost. Thus, biometric systems are being deployed to enhance security and reduce financial fraud. Various biometric traits are being used for real-time recognition, the most popular being face, iris and fingerprint. However, there are biometric systems that are based on retinal scan, voice, signature and hand geometry.

Application of Biometrics

While biometric systems, particularly automatic fingerprint identification systems (AFIS), has been widely used in forensics for criminal identification, recent advancements in biometric sensors and matching algorithms have led to the deployment of biometric authentication in large number of civilian and government applications. Biometrics is being used for physical access control, computer login, welfare disbursement, international border crossing and national ID cards. It can be used to verify a customer during transactions conducted via telephone and Internet (electronic commerce and electronic banking). In automobiles, biometrics is being adopted to replace keys for keyless entry and keyless ignition. Due to increased security threats, the ICAO (International Civil Aviation Organization) has approved the use of e-passports with an embedded chip containing the holder's facial image and other traits).

Biometrics is also becoming popular in ATMs. Recently, fifteen biometric ATM machines were installed in five districts of southern India.

The scanner kiosks are forecasted to service over 100,000 people who will scan their fingerprints rather than swiping a card and inputting a PIN number. According to Financial Software and Systems the country is scheduled to increase the number of ATMs from 35,000 to 100,000 in the next three years.

10.8 CLIENT-SERVER NETWORK SECURITY

Client server network security is one of the biggest headaches system administrators face as they balance the opposing goals of users maneuverability and easy access and site security and confidentiality of local information. According to the national center of computer data, computer security violations cost U.S businesses half a billion dollar each year. The concerns are real, and doing nothing is analogous to leaving a door unlocked in a high crime neighborhood.

Network security on the internet is a major concern for commercial organizations, especially top management. Recently, the internet has raised many new security concerns. By connecting to the internet, a local network organization may be exposing itself to the entire population on the internet. An internet connection effectively breaches the physical security perimeter of the corporate network and itself to access from other networks comprising the public internet.

That being the case, the manager of even the most relaxed organization must pay some attention to security. For many commercial operations, security will simply be a matter of making sure that existing system features, such as passwords and privileges, are configured properly. They need to audit all access to the network.

A system that records all log-on attempts particularly the unsuccessful ones-can alert managers to the need for stronger measures. However, where secrets are at stake or where important corporate assets must be made available to remote users, additional measures must be taken. Hackers can use passwords guessing, password tapping, security holes in programs, or common network access producers to impersonate users and thus pose a threat to the server.

Client server network security problems manifest themselves in three ways:

1. Physical security holes result when individuals gain unauthorized physical access to a computer. A good example would be a public workstation room, where it would be easy for a wandering hacker to reboot a machine into single-user mode and tamper with the files, if precautions are not taken. On the network, this is also a common problem, as hackers gain access to network systems by guessing passwords of various users.
2. Software security holds result when badly written program or "privileged" software is "compromised" into doing things they shouldn't. The most famous example of this category is the "send mail" hole in the IBM RS-6000 workstations, which enabled a cracker (a malicious hacker) to create a "root" shell or super user access mode. This is the highest level of access possible and could be used to delete the entire file system, or create a new account or password file resulting in incalculable damage.
3. Inconsistent usage holes result when a system administrator enables a combination of hardware and software such that the system is seriously flawed from a security point of view. The incompatibility of attempting two unconnected but useful things creates the security hole. Problems like this are difficult to isolate once the system is setup and running, so it is better to carefully build the system with them in mind. This type of problem is becoming common as software become more complex.

To reduce these security threats, various protection methods are used. At the level, operating systems typically offers mechanisms such as access controls lists that specify the resources various users and groups are entitled to access. Protection also called authorization or access controlled-grants privileges to the system or resource by checking user specific information such as passwords. The problem in the case of e-commerce is very simple: if consumers connect a computer to the internet, they can easily log into from anywhere that the network reaches. That's a

good news. The bad news is without proper access control, anyone else can also access.

Over the years, several protection methods have been developed, including trust based security, security through obscurity, password schemes and biometric systems.

- **Trust Based Security:** Quite simply trust-based security means to trust everyone and do nothing extra for nothing.
- **Security through Obscurity:** Most organizations in the mainframe era practiced a philosophy known as security through obscurity (STO)-the notion that any network can be secure as long as nobody outside it's management group is provided information on a need-to-know basis.
- **Firewall and Network Security:** The most commonly accepted network, protection is a barrier, a firewall between the corporate network and the outside world (untrusted networks). Basically it is a method of placing a device-a computer or a router-between the network and the internet to control and monitor all traffic between the outside world and the local networks.

Firewalls come in several types and offer various levels of security, generally, firewalls operate by screening packets and for the application that pass through them, provide controllable filtering of network traffic, allow network traffic, allow restricted access to certain applications, and block access to everything. In principle, the firewall can be thought of as a pair of mechanisms: one to block in coming traffic and other to permit out going traffic. Some firewalls place a greater emphasis on blocking traffic, and others emphasis on permitting traffic.

Firewalls ranges from simple traffic login systems that record all network traffic flowing through the firewall in a file or database for auditing purposes to more complex methods such as IP packet, screening routers, hardened firewall hosts, and proxy application gateways. The simplest firewall is a packet filtering gateway of screening router, configured with filters to restrict traffic to designate addresses, screening routers also limit the type of services that can pass through them.

10.9 DATA AND MESSAGE SECURITY

10.9.1 Encryption and Transaction Security

Sensitive information that must travel over public channel (such as the Internet) can be defended by encryption, or secret codes. Although it may sound like the stuff of spy novels, electronic commerce relies heavily on encryption. The goal of encryption is to make it impossible to hacker who obtains the cipher text (encrypted information) as it passes on the network to recover the original message. Encryption is the mutation of information in any form (text, video, graphics) into a form readable only with a decryption key. A "key" is a very large number, a string of zeros and ones.

There are two main kinds of encryption in common use today. The older and simpler one is called "single-key" or "secret-key" encryption. The more recent method is called "public-key" encryption.

Secret-Key Encryption

Secret-key encryption, also known as symmetric encryption, involves the use of a shared key for both encryption by the transmitter and decryption by the receiver. Secret-key encryption works in the following way: Annne wishes to send a purchase order (PO) to Bob in such a way that only Bob can read it. Anne encrypts the PO (the plaintext) with an encryption key and sends the encrypted PO (the cipher text) to Bob. Encryption scrambles the message, rendering it unreadable to anyone but the intended recipient.

Bob decrypts the cipher text with the decryption key reads the PO. Note that in secret -key encryption, the encryption key and decryption key are the same. The transmitter uses a cryptographic secret "key" to encrypt the message and the recipient must use the same key to decipher or decrypt it. A widely adopted implementation of secret-key encryption is data encryption standard (DES).

Although secret-key encryption is useful in many cases, it has significant limitations. All parties must know and trust each other

completely, and have in their possession a protected copy of the key. If the transmitter and receiver are in separate sites, they must trust not being overheard during face-to-face meetings or over a public messaging system (a phone system, a postal service) when the secret key is being exchanged. Anyone who overhears or intercepts the key in transit can later use the key to read all encrypted messages.

Since shared keys must be securely distributed to each communicating party, secret -key encryptions suffers from the problem of key distribution-generation, transmission, and storage of keys. Secure key distribution is cumbersome in large networks and does not scale well to a business environment where a company deals with thousands of online customers. Further, secret-key encryption is impractical for exchanging messages with a large group of previously unknown parties over a public network. For instance, in order for a merchant to conduct transactions securely with Internet subscribers, each consumer would need a distinct secret key assigned by the merchant and transmitted over a separate secure channel such as a telephone, adding to the overall cost. Hence, given the difficulty of providing secure key management, it is hard to see secret-key encryption becoming a dominant player in electronic commerce.

If secret encryption cannot ensure safe electronic commerce, what can? The solution to widespread open network security is a newer, more sophisticated form of encryption, first developed in the 1970s, known as public-key encryption.

PUBLIC -KEY ENCRYPTION

Public-key encryption , also known as asymmetric encryption , uses two keys : one key to encrypt the message and a different key to decrypt the message . The two keys are mathematically related so that data encrypted with one key can only be decrypted using the other .

Unlike secret-key encryption , which uses a single key shared by two (or more) parties , public-key encryption uses a pair of keys for each party . One of the two keys is "public" and the other is "private" . The public key can be made known to other parties, the private key must be kept confidential and must be known only to its owner. Both keys , however , need to be protected against modification.

Directory, and a "private key," which is kept secret. The two keys work together; whatever data one of the keys "locks," only the other can unlock.

For example, if an individual wants to send a snoop -proof e-mail message to a friend, she simply looks up his public key and uses that key to encrypt her text. When the friend receives the e-mail, he uses his private key to convert the encrypted message on his computer screen back to the sender's original message in clear text. Since only the bona fide author of an encrypted message has knowledge of the private key, a successful decryption using the corresponding public key verifies the identity of the author and ensures message integrity. Even if a would -be criminal intercepts the message on its way to the intended recipient, that criminal has no way of deciphering the message without the private key.

10.9.2 Digital Signature (Electronic Signature)

Definition of Electronic Signature: A computer data compilation of any symbol or series of symbols, executed, adopted, or authorized by an individual to be the legally binding equivalent of the individual's handwritten signature.

A digital signature (not to be confused with a digital certificate) is an electronic signature that can be used to authenticate the identity of the sender of a message or the signer of a document, and possibly to ensure that the original content of the message or document that has been sent is unchanged. Digital signatures are easily transportable, cannot be imitated by someone else, and can be automatically time-stamped. The ability to ensure that the original

signed message arrived means that the sender cannot easily repudiate it later. A digital signature can be used with any kind of message, whether it is encrypted or not, simply so that the receiver can be sure of the sender's identity and that the message arrived intact. A digital signature contains the digital signature of the certificate-issuing authority so that anyone can verify that the certificate is real.

How it works

Assume you were going to send the draft of a contract to your lawyer in another town. You want to give your lawyer the assurance that it was unchanged from what you sent and that it is really from you.

1. You copy-and-paste the contract (it's a short one!) into an e-mail note.
2. Using special software, you obtain a message hash (mathematical summary) of the contact.
3. You then use a private key that you have previously obtained from a public -private key authority to encrypt the hash.
4. The encrypted hash becomes your digital signature of the message. (Note that it will be different each time you send a message.)

Other interesting issues worth pursuing for further information related to encryption include:

- Secure sockets layer (SSL) protocols, which allow for the transmission of encrypted data across the Internet by running above the traditional TCP/IP protocols;
- The effectiveness - and occasion flaws - in easily -accessible (freeware) security technologies such as PGP;
- Other uses of encryption, such as the closely-related notions of digital signatures (very broadly defined), access controls, and watermarks;

- The technical means by which keys use hash tables to achieve the encryption and decryption process;
- Regulation of Certificate Authorities (CAs), Registration Authorities that validate users having been issued certificates and the directories that store certificates, public keys and certificate management information.



CHECK YOUR PROGRESS

Q.1 : Explain the security issues related to e-commerce .

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Q.2 : Explain the various types of risks associated with e-commerce.

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Q.3 : What is spyware ?

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Q.4 : How can you protect your e-commerce systems ?

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10.10 LET US SUM UP

In this unit we have discussed the following aspects-

- E-commerce security issues
- Risks involved in E-commerce

- protecting e-commerce system
- Common E-commerce security tools
- Authentication
- Access control
- Firewall
- Preventing problems from viruses, Trojans and worms
- Digital Identity and Digital signature
- Biometric
- Client-server Network security
- Trust based security
- Firewalls and Network Security
- Data and Message Security
- Encryption
- Digital signature (Electronic signature)



10.11 FURTHER READING

1. Electronic commerce, A manager's guide - Ravi Kalkota and Andrew B. Whinston, Pearson Education.
2. E-Commerce, Strategy, Technologies and Applications - David Whiteley, Tata Megraw-hill.
3. E-commerce and its Applications, - US Pandy, Rahul Srivastava, Saurabh Shukla, S. Chand & Company Ltd.

10.12 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q1: The use of the Internet means that your internal IT and e-commerce systems are potentially accessible by anyone, irrespective of their location.

The following points outline the security issues related to e-commerce:

- Access control: If access control is properly implemented, many other security problems, like lack of privacy, will either be eliminated or mitigated. Access control ensures only those that legitimately require access to resources are given access and those without valid access to resources. Various types of threats exist for access control.
- Privacy: Privacy ensures that only authorized parties can access information in any system. The information should also not be distributed to parties that should not receive it.



- Protection of privacy requires access control, however access control deals with the larger picture. Due to this, the threats to privacy are similar to that of access control. Integrity ensures that only authorized parties make changes to the documents transmitted over the network. Lack of integrity of the system can be devastating for e-commerce.
- Authentication: Authentication ensures that the origin of an electronic message is correctly identified. This means having the capability to determine who sent the message and from where or which machine. Without proper authentication, it will be impossible to know who actually placed an order and whether the order placed is genuine or not.
- Non-repudiation: Non-repudiation is closely related to authentication and this ensures the sender cannot deny sending a particular message and the receiver cannot deny receiving a message. If this happens infrequently, it may not significantly

harm E-commerce, however, on a large scale this can be devastating.

- Availability: Availability ensures that the required systems are available when needed. For an e-commerce site this means that the customer order systems are available all the time. Two major threats to availability problems are virus attacks and denial of service.

Ans to Q2: Some of the more common threats that hackers pose to e-commerce systems include:

- Carrying out denial-of - service (DoS) attacks that stop access to authorized users of a website, so that the site is forced to offer a reduced level of service or, in some cases, cease operation completely
- Gaining access to sensitive data such as price lists, catalogues and valuable intellectual property, and altering, destroying or copying it.
- Altering your website, thereby damaging your image or directing your customers, to another site
- Gaining access to financial information about your business or your customers with a view to perpetrating fraud
- Using viruses to corrupt your business data

Risks from Viruses, Trojans and Worms

- Viruses, Trojan horses and worms are all computer programs that can infect computers.
- Viruses and worms spread across computers and networks by making copies of themselves, usually without the knowledge of the computer user.
- A Trojan horse is a program that appears to be legitimate but actually contains another program or block of undesired malicious, destructive code, disguised and hidden in a block of desirable code. Trojans can be used to infect a computer with a virus.

- A back-door Trojan is a program that allows a remote user or hacker to bypass the normal access controls of a computer and gives them unauthorized control over it. Typically a virus is used to place the back-door Trojan onto a computer, and once the computer is online, the person who sent the Trojan can run programs on the infected computer, access personal files, and modify and upload files.

While some viruses are merely irritants, others can have extremely harmful effects. Some of the threats that they pose to e-commerce systems include:

- Corrupting or deleting data on the hard disk of your server
- Stealing confidential data by enabling hackers to record user keystrokes
- Enable hackers to hijack your system and use it for their own purposes
- Using your computer for malicious purposes, such as carrying out a denial-of-service (DoS) attack on another website
- Harming customer and trading partner relationships by forwarding viruses to them from your own system.

Ans to Q3: Spyware is software that is placed on your computer when you visit certain websites. It is used to secretly gather information about your usage and sends it back to advertisers or other interested parties. In addition to tracking your system use, it can also slow down or crash your computer.

Ans to Q4: Securing your E-commerce System

As the use of Internet continues to grow, websites are assuming greater importance as the public face of business. Furthermore, the revenues generated by e-commerce systems mean that organizations are becoming ever more reliant upon them as core elements of their business.

With this high level of dependency upon the services provided by e-commerce systems, it is essential that they are protected from the

threats posed by hackers, viruses, fraud and denial-of-service (DoS) attacks.

It is important that the risks facing by e-commerce system, and the potential impact should any security incident arise.

Threats to e-commerce systems can be either malicious or accidental. The procedures and controls you put in place to protect your site should help minimize both.

Malicious threats could include:

- Hackers attempting to penetrate a system to read or alter sensitive data
- Burglars stealing a server or laptop that has unprotected sensitive data on its disk
- Imposters masquerading as legitimate users and even creating a website similar to yours
- Authorized users downloading a web page or receiving an email with hidden active content that attacks your systems or sends sensitive information to unauthorized people



10.13 MODEL QUESTIONS

Q.1. Explain different types of threats to e-commerce systems .

Q.2. Explain some common e-commerce security tools .

Q.3. Explain different types of firewalls .

Q.4. Explain Digital signature and also explain how does it works .

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UNIT 11: CYBER CRIMES

UNIT STRUCTURE

11.1 Learning Objectives
11.2 Introduction
11.3 Cyber Crime
11.4 Hacking
11.5 Digital Forgery
11.6 Identity Theft
11. 7 Cyber Stalking
11.8 Cyber Terrorism
11.9 Cyber Defamation
11.10 Software Piracy
11.11 Information Technology Act, 2000
11.12 Let Us Sum Up
11.13 Further Reading
11.14 Answers to Check Your Progress
11.15 Model Questions

11.1 LEARNING OBJECTIVES

After going through this unit you will be able to:

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

11.2 INTRODUCTION

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

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

11.3 CYBER CRIME

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

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

Some of the common cyber crimes are mentioned below :

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

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

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

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

11.4 HACKING

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

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

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

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

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

11.5 DIGITAL FORGERY

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

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

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

11.6 IDENTITY THEFT

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

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

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

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

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



CHECK YOUR PROGRESS

Q.1 : Define cyber crime?

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

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Q.3 : Who are the crackers?

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11.7 CYBER STALKING

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

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

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

11.8 CYBER TERRORISM

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

In cyber terrorism, the terrorists use the internet to conduct violent acts that may cause loss of life or bodily harm. The terrorists not only target human property and life but also try to cause deliberate failure of functioning of government services by targeting communication networks. Government services like electric and solar power plants, air and rail traffic systems, telecommunication systems, medical services, police and military services

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

11.9 CYBER DEFAMATION

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

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

- world wide web
- social networking sites
- email and messaging
- discussion groups
- bulletin boards

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

11.10 SOFTWARE PIRACY

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

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

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

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

11.11 INFORMATION TECHNOLOGY ACT, 2000

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

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

- Tampering with Computer source documents - Sec.65
- Hacking with Computer systems, Data alteration - Sec.66
- Sending any message that is offensive - Sec 66 A
- Publishing obscene information in electronic form - Sec.67
- Un-authorised access to protected system Sec.70
- Breach of Confidentiality and Privacy - Sec.72
- Publishing false digital signature certificates - Sec.73

Some of the cyber crimes under IPC are mentioned below :

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



CHECK YOUR PROGRESS

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

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Q.5 : Define cyber stalking.

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

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

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11.12 LET US SUM UP

In this unit we have discussed the following aspects-

- Cyber crime can be defined as any crime that is performed using a computer and network either as a tool or as a target.
- Hacking can be defined as an illegal intrusion into a computer system or network. This is a type of crime where an individual or institution's computer

is broken into so that personal or sensitive information can be accessed. The person who performs the act of hacking is known as a hacker.

- Ethical hackers are persons who hack into the computer system with an aim to identify the weaknesses present in the system and not for any personal gain. Crackers are persons who hack into the computer system with an aim to gain unauthorized access to the system or network for personal gain.
- Digital forgery is the digitization of the process of forgery. Forgery in traditional systems is the crime of falsely and fraudulently making or altering a document and even possessing such a forged document. Digital forgery is the crime of falsely and fraudulently making or altering a documents and pictures in the digital domain.
- Identity theft can be defined as stealing personal information of a person and impersonating as that person. In identity theft, a criminal impersonates another person who actually exists. In identity fraud, a criminal creates a fictional person and assumes this fictional person's identity.
- Cyber stalking can be defined as the act of stalking done by using the means of computer systems or internet. The term cyber bullying is generally used when the parties involved are not adults and includes teenagers or children.
- Cyber terrorism can be defined as an act of terrorism that is committed using computer systems and networks. Cyber warfare can be defined as the action by a nation or a state to penetrate another nation's computers or networks for the purpose of causing damage.
- Cyber defamation can be defined as defamation done using digital media usually through the internet. When a person publishes defamatory matter about someone on a website or sends e-mails containing defamatory information to all of that person's friends, it is termed as cyber defamation.
- Software piracy can be defined as the unauthorized copying or illegal distribution of copyrighted materials.
- The Information Technology (IT) Act, 2000 is an Act of the Indian Parliament enacted with the prime objective to create an enabling

environment for commercial use of information technology. The IT Act specifies the acts which have been made punishable by law regarding cyber crime and electronic commerce in India.

- A major amendment of the IT Act was made in the year 2008 to include penalties for offensive messages, child pornography, cyber terrorism and voyeurism.



11.13 FURTHER READING

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

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

Ans to Q2: In identity theft, a criminal impersonates another person who actually exists. In identity fraud, a criminal creates a fictional person and assumes this fictional person's identity. The criminal in identity fraud creates a whole new person, with both personal and financial details whereas in identity theft, the criminal impersonates an already existing person.

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

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

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

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

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



11.15 MODEL QUESTIONS

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

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

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

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

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

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

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

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

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

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

*** ***** ***



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Name of the Paper:
Course Code:

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Krishna Kanta Handiqui State Open University

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Learner's Feedback on Course

Dear Learner,

Regarding the course as mentioned above, we would like to know your opinions and comments so as to improve the quality of self learning materials in future. Please respond to the following statements by ticking the number you feel most reflect your opinion. After completion of the additional comments, please detach the page and send/mail the same to us at the address given below.

The Director, Centre for Internal Quality Assurance, KKHandiqui State Open University
Housefed Complex, Dispur, Guwahati- 781006
(E-mail id: ciqa@kkhsou.in)

1. Approximately how many hours did you spend for studying the units in the course? | | | |

2. Please give your opinions (by ✓ mark) to the following items based on your reading of the block:

Sl. No.	Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I	The SLMs of the course fulfil the learning objectives set out in the beginning of each unit					
II	The units of the SLM could satisfy my academic needs and expectations					
III	The Unit writers have excellent knowledge about the course contents					
IV	Language and contents of the units were presented at a level which I could readily understand					
V	Ample opportunity for participation in the activities provided in the units					
VI	Used enough Illustrations (Diagrams, tables etc.) for conceptual clarity					
VII	Quality of content is engaging, relevant, and up-to-date					
VIII	The self check questions are very helpful					
IX	The Possible/model questions and the answers to check my progress have benefited me a lot					

Additional Comments: *(Please feel free to provide your open comments)*

1. Which aspects of the SLM, according to you, worked well?

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2. What sort of changes/improvements do you feel KKHSOU could implement to improve the overall quality of the SLM?

Thank you for taking the time to complete this form.