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# **E-COMMERCE MANAGEMENT**

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# CHAPTER I - INTRODUCTION TO E-COMMERCE

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### Meaning of commerce

Commerce is defined as those activities involving the removal of hindrance in person, place, time, money, knowledge, risk in the process of exchange of goods and services

### Meaning of E-commerce

*E-Commerce is the process of doing business online. E-commerce is the process of doing business electronic.* It changes the entire business scenario due to the powerful innovation of Internet, which is spreading fast through the world. The power of Internet as a global access was felt with the introduction of the World Wide Web (WWW) in 1994. This global network makes global relations with the companies made easier. It is predicted that, in the near future the digital economy will overtake the traditional economy of all developed countries.

E-commerce is a composite of technologies process and business strategies that foster the instant exchange of information within between organization. E-commerce strengthens relationship with buyers make it easier to attract new customer, improves customer responsiveness and open new markets on a global scale. E-commerce is the application of various communication technologies to provide the automated exchange of business

information with internal and external customer, suppliers and financial institutions.

### **E-commerce V/s Traditional Commerce**

BASIS	E-COMMERCE	TRADITIONAL SYSTEM
Reduce Data Error	Doesn't involve data at multi points. Data goes directly from one computer to another Computer without involving human being	The buyer and seller create purchase order on their system and send it to their trading partner. The receiver/seller then re-enter the same information on the computer, which will create data error
Reduce cost	Initial cost of E-commerce is very high as compared to paper process but over a long period of time, it is very effective	Time is directly; linked to saving the money. There is repetition of same work at every level and it involves a lot of wastage of time and if the error is arisen that will lead to more wastage of money.
Reduce Paper work	E-commerce data in the electronic form make it easy to share it across the organization	It requires re-entry of data at each level and requires lot of time. So the peak time is wasted in re-entering and printing of the reports
Reduce Processing cycle time	E-commerce reduces the processing cycle time of complete cycles as the data is entered the	When the buyer order in a paper format, the data is re-entered in to the Sellers's computer and

	system, it is simultaneously Processed	then only processing can take place which is a time consuming process.
Reduce labour	No need to maintain large number of employees, instead there arises the need to manage them more efficiently	Need to maintain a large number of employees because one-third of labour force is employed to fulfil orders from customers.

### Electronic Data Interchange [EDI]

*EDI is the electronic exchange of business documents in a standard, computer processable, universally accepted format between trading partners.* It is a standard for the electronic exchange of business documents, such as invoices and purchase orders. EDI consists of standardized electronic message formats for common business documents such as purchase order, request for quotation, bills of lading, invoice and similar documents. These electronic documents enable in one company to talk to computers in another company without producing paper documents. To set up EDI, a company must have computerized accounting records and establish trading partners who agree to exchange EDI transactions. Use of electronic data interchange thus eliminates the human effort required to read, sort and physically transport such documents. It requires the co-operation of trading partners. It also requires various mechanisms, which guarantee that the data, which leaves the boundaries of one corporation, arrives at the gates of the other without changing in any particular.

### HISTORY OF E COMMERCE

EDI is a set of standards developed in the 1960's to exchange business information and do electronic transactions. Electronic Data interchange [EDI] allowed different companies to perform electronic dealings with one another.

The internet was conceived in 1969, when the Advanced Research Projects Agency [a Department of Defence Organization] funded research of computer networking. The Internet could end up like EDI without the emergence of World Wide Web in 1990s

XML, as a Meta Mark up Language, provides a development tool for defining format of data interchange in a wide variety of business communities. Web services offer a flexible and effective architecture for the implementation.

The next important phase in the History of E-commerce was the development of Mosaic Web browser in 1992. The Web Browser was soon given the form of a browser which could be downloaded and was named as Netscape

The next important milestone in e-commerce was the development of Napster. Napster was an online application used to share music files for free. Many consumers used the site and were dictating what they wanted from the Industry. Napster allowed people to download music from the Internet for free.

The development and adaptation of DSL and Red hat Linux respectively, again benefited the process of online business transaction. The year 2000, saw a major merge between AOL and Time Warner which marked another important step towards the development of E-commerce.

The World wide popularity of Internet has resulted in the stable development and overwhelming acceptance of E-Commerce. E-Commerce provides with a rich online transaction experience. Business to Business is the largest E-Commerce in the present time. Peer to Peer and Consumer to Consumer are two important types of E-Commerce.

## Working of EDI

### 1. Preparation of electronic documents

The first step in the sequence of EDI is the collection of information and data. The way to collect the required information should be same as the way to do it in the traditional system. However, instead of printing out the data on paper in tradition, the system has to build an electronic file or database to store those data. In the case of companies who already use computer to issue their documents like purchase orders, they may already have some sort of databases which store those information, then they fan start with the next step described below.

### 2. Outbound translation

The next step is to translate the electronic file or database in to a standard format according to the specification of the corresponding document. The resulting data file should contain a series of structured transactions related to the purchase order for example. If more than one company is involved in the particular transaction, individual files should be produced for each of them.

### 3. Communication

Then the computer should connect and transmit those data files to the pre arranged Value Added Network [VAN] automatically. The VAN should then process each file and route the appropriate electronic mailboxes according to the destination set in the file.

### 4. Inbound translation

The designated company should be able to retrieve the file from their electronic mailboxes in a constant period, and then reverse the process by translating the file from the standard format into the specific format required by the company's application software.

### 5. Processing the electronic documents

The internal application system of the designated company can process the received documents now. All the resulted documents corresponding to the received transaction should use the same processes or steps to transmit back to the transaction initiator; the whole cycle of the electronic data interchange can they be completed.

### E-commerce V/s E business

#### Benefits of EDI

- Lower Processing cost
- Improves the overall quality of data
- Helps to manage information system effectively and efficiently
- Helps to reduce inventory level
- Transfer of information from computer to computer is automatic and data is entered only at the source
- Customer relations can be improved
- Business relations with trading

#### E BUSINESS

E-business refers to companies for which internet is one of several channels to customers and perhaps not even the primary one. Banks are a classic example of such companies

E-Commerce	E-Business
Open system [statistics]	Closed System
Not secured	Secured
Deals more with technology	Deals with processes needed to facilitate e-commerce
Does not involve the use of EDI	Used EDI
Always operate on Internet	Always operates on intranet
Involves all types of commerce transaction	Involves explicitly business transactions
Focused on Business to consumer activities	Focused more on business to business activities
e-commerce is an extension of a traditional business model	e-business is an online business only
Used for small and bulky transaction	Used for bulky transaction

## Challenges of E-commerce

### 1. Lack of adequate infrastructure for IT technology and Internet

The penetration of personal computers in India is as low as 3.5 per thousand of population compared to over 6 per thousand in China and 500 per thousand in USA.

### 2. High tariff rate

Another important reason for not developing e-commerce is the high tariff rate charged by Internet Service Providers [ISPs] Speed and connectivity is also poor.

### 3. Favourite targets of hackers

Another problem faced is that e-commerce sites are one of the favourite targets of hackers. If you think that your site is not relevant enough to catch their attention, you are wrong, and this way of thinking will help you to prepare to face related risks. And the most serious drawback is the absence of effective cyber law at the moment. E-commerce is

governed by the UNCITRAL model code, but this is not binding on any country. It is expected that all WTO member countries will soon enact laws to govern e-commerce. Towards this end, India has passed her Information Technology Act in May 2000. However; this Act simply considers the commercial and criminal side of law and fails to consider other multidimensional aspects of e-commerce.

### 4. Privacy and security issues

Another cause for the slow growth of e-commerce is the privacy and security issues. Measures like digital signatures, Digital certificates, and fire walls can be adopted to secure safety and protection over the message passed on internet. Payment related problems also continue to block the e-commerce activities. Electronic cash, credit cards etc. are some of the popular payment method used for e-commerce transactions. But unfortunately penetration of e-cash and credit cards not only low, but Indian consumers are suspicious about the threat of fraud played by unscrupulous hackers. In order to minimize this problem experts suggest the use of digital certificate along with credit card to secure their payment activities.

## Limitations of E-commerce

- Credit card security is a serious issue if vulnerable
- Costs involved with bandwidth and other computer and server costs
- Extensive database and technical knowledge and experience required
- Customer apprehension about online Credit Card orders
- Consistently changing technology may leave slow business behind
- Some customers need instant gratification, and shipment times interrupt that
- Search utilities far surpasses the speed used to find products through catalogues
- Encourages competition between small and large online retailers

## Supply Chain Management

**A SUPPLY CHAIN** is a network of supplier, manufacturing, assembly, distribution and logistics facilities that perform the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these products to customers. Supply chains arise in both manufacturing and service organizations.

It is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. Supply Chain Management [SCM] is a systems approach to managing the entire flow of

## BENEFITS OF E COMMERCE

- Expanded geographical reach
- Expanded customer base
- Increase visibility through Search engine Marketing
- Provide customers valuable information about your business
- Available 24/7/365 – Never close
- Build customer Loyalty
- Reduction of Marketing and Advertising costs
- Collection of customer Data

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## DEFINITION OF SUPPLY CHAIN MANAGEMENT

Managing supply and demand;

Sourcing raw materials and parts

Manufacturing and assembly

Warehousing and inventory tracking

Order entry and order management

Distribution across all channels and

Delivery to the customers

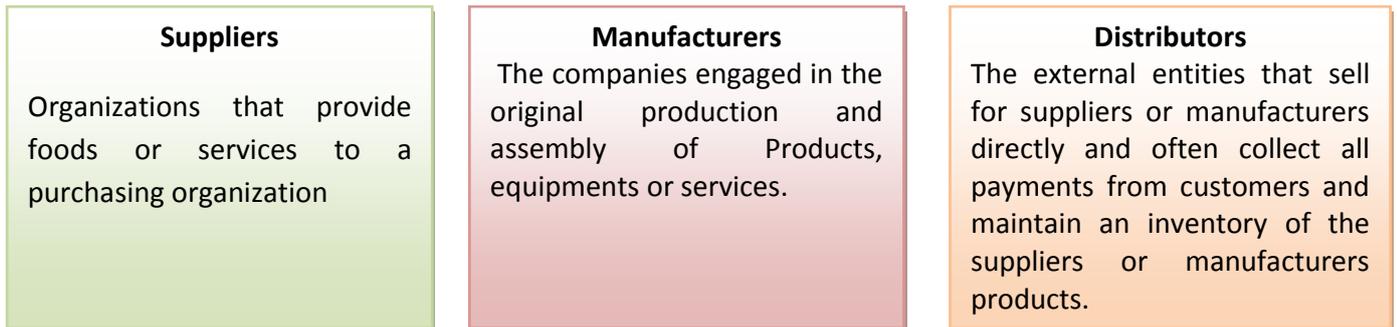
(The supply chain council)

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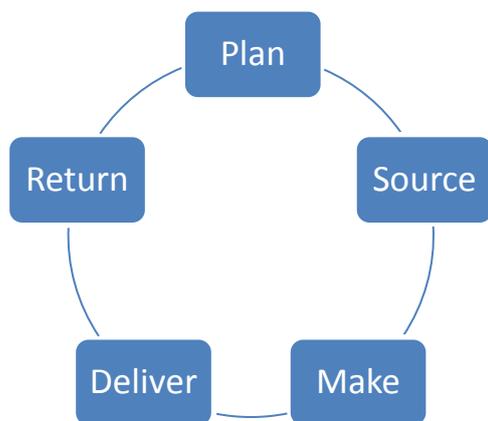
information, materials, and services from raw materials suppliers through factories and warehouses to the end customer. SCM is different from Supply Management which emphasizes only the buyer supplier relationship.

Supply chain Management is utilized to facilitate the coordination with outside business entities, or in the scope of extended enterprise. SCM usually refers to the redesign of supply chain processes in order to achieve streamlining of supply chain collaboration. It is generally performed only by large corporations with large suppliers. A Supply chain is a collection of interdependent steps that, when followed, accomplish certain objective such as meeting customer requirements. It is the combination of art and science that goes into improving the way your company finds the raw components it needs to make a product or service manufacture the product or service and delivers it to customers.

### Parties involved in a supply chain



### **Basic components for supply chain management**



1. **Plan** – This is the strategic portion of supply chain management. You need a strategy for managing all the resources that go toward meeting customer demand for your product or service. A big piece of planning is developing a set of metrics to monitor the supply chain so that it is efficient, costs less and delivers high quality and value to customers.

2. **Source**- Choose the suppliers that will deliver the goods and services you need to create your product or service. Develop a set of pricing, delivery and payment

3. **3. Make**- this is the manufacturing step. Schedule the activities necessary for production, testing, packaging and preparation for delivery. As the most metric intensive portion of the supply chain, measure quality levels, production output and worker productivity.
4. **Deliver**- This is the part that many insiders refer to as logistics. Co-ordinate the receipt of orders from customers, develop a network of warehouses, pick carriers to get products to customers and set up an invoicing system to receive payments
5. **Return**- The problem part of the supply chain. Create a network for receiving defective and excess products back from customers and supporting customers who have problems with delivered products.

### **Types of Supply Chain Management Systems**

#### **1. Public B2B Exchanges**

In this type of supply chain Management system, companies get more options to select the suppliers that fit in their business needs, and they also have more power in negotiating the prices and terms of services. The cost of participation in a public exchange is significantly lower than implementing our own SCM systems

## **2. Private Supply Chain Management systems'**

It is developed for specific industry and particular company. SCM systems are often tightly integrated a limited few suppliers and trading partners. The purpose of SCM is more of collaboration than price negotiation. The disadvantage of private supply chain software.

# CHAPTER 2 – BUSINESS MODELS OF E-COMMERCE

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## 1. Business to Business [B2B]

B2B (business – to- business) is the major and valuable model of e-commerce. B2B (business – to- business) e-commerce is conducted between two separate businesses and has been in effect for many years. E-commerce plays an important role in enhancing and transforming relationships between and among business. B2B (business – to- business) is also known as e-biz, is the exchange of products, services, or information between businesses rather than between businesses and consumers. Although early interest centered on the growth of retailing on the Internet (sometimes called e-tailing), forecasts are that B2B revenue will far exceed business to consumers [B2C] revenue in the near future. B2B (business – to- business) is a kind of e-commerce, which refers to a company selling or buying from other companies. One company communicates with other companies through electronic Medias. Some of these transactions include sending and receiving orders, invoice and shopping orders. It was an attractive alternative to the current process of printing, mailing various business documents.

Some B2B applications are the following: -

### 1. Supplier Management

Electronic applications in this area helps to speed up business partnerships through the reduction of purchase order processing costs and cycle times, and by maximizing the number of purchase order processing with fewer people.

### 2. Inventory Management

Electronic applications make the order-ship bill cycle shorter. Businesses can easily keep track of their documents to make sure that they were received. Such a system improves auditing capabilities, and helps reduce inventory levels, improve inventory turns, and eliminate out- of stock occurrences.

### 3. Distribution Management

Electronic based applications make the transmission of shipping documents much easier and faster. Shipping documents include bill of lading, purchase orders, advance ship notices, and manifest claims. E-commerce also enables more efficient resource management by certifying that documents contain more accurate data.

### 4. Channel Management

E-commerce allows for speedier distribution of information regarding changes in operational conditions to trading partners. Technical, product and pricing information can be posted with much ease on electronic bulletin boards.

### 5. Payment Management

An electronic payment system allows for a more efficient payment management system by minimizing clerical errors, increasing the speed of computing invoices, and reducing transaction fees and costs. Many organizations are implementing electronic commerce in numerous ways and receiving tangible benefits but as electronic commerce matures and develops, these ways are likely to change based on the accelerating adoption rate.

## 2. Business – to Consumer [B2C]

Business – to Consumer [B2C] e-commerce consists of the sale of products or services from a business to the general public. Products can be anything from clothing to flowers and the products can also be intangible products such as online banking, stock trading, and airline reservations. Sellers that use B2C

business model can increase their benefits by eliminating the middlemen. This is called disintermediation because businesses sell products directly to consumers without using traditional retail channels. Business – to Consumer [B2C] is basically a concept of online marketing and distributing of products and services over the internet. It is a natural progression for many retailers or marketer who sells directly to the consumer. The general idea is, if you could reach more customers, service them better, and make more sales while spending less to do it that would be the formula of success for implementing a B2C e-commerce infrastructure.

### **3. Business – to –Government [B2G] e-commerce**

**B2G** refers to the supply of goods and services for online government procurement. This is a huge market which mainly covers everything from office supplies to military equipment. B2G websites offer lower costs and greater choice to the administration, and make government tendered offers more accessible to companies. B2G is a derivative of B2B marketing and often referred to as a market definition of public sector marketing which encompasses marketing products and services to various government levels including-federal, state and local- through integrated marketing communications techniques using as strategic public relations, branding, , advertising, and web based communications.

### **4. Business- to- employee [B2E]**

Business- to- employee [B2E] uses an intra business network which allows companies to provide products and/ or services to their employees. It is the use of intranet technologies to handle activities that take place within a business. An intranet is an internal network that used Internet technologies. Business- to- employee [B2E] is different from other type since it is not a revenue form of business. Otherwise, it increases profits by reducing expenses within a company. Instead of having to look everything up manually they can collaborate with each other and exchange data and other information.

## **E-Commerce Strategy**

Companies with an E-business strategy are more open. The entire organization focuses on the market and has greater visibility, more efficient collaboration and stronger relationships. Opening up a business, however, requires an extended ERP Solution which integrates the front office with the back-office system. Customer Relationship Management [CRM] and Supply Chain Collaboration [SCC] compliment back-office relationship. SCC streamlines the flow of information and self service capabilities through automation and interaction. Such solution allows customers, partners and employees to access system functions and information via the Internet. They use the critical business and financial information in your ERP solution to promote profitable new ways to work with customers and vendors.

### **Influencing factors of successful E-commerce**

The crucial factors to be considered while launching an E-commerce web site are

1. **Website:** Website must be easy to navigate since the surfer should not have to search for the product or details he or she is looking for. The website should project its products in as provocative way so the surfer wants to see more. Place testimonials or photos of the product can also help to create a positive image.
2. **Merchant Account:** All major credit cards have to be accepted for an e-commerce transaction. So there arises a need for a merchant account.
3. **Shopping cart and Secure server:** The online shopping cart allows the customers to choose and place their chosen products in the cart just as one would do in shopping mall. This cart will, at the end of the shopping, total the products and give the total cost of the products chosen.
4. **Payment gateway:** This is the link from the credit card to the credit card processor. This gateway helps information to pass from the website to the authorization centre where the credit card is verified and then charged, after that the reply will come back into the website that the processing has been successful. A payment gateway will always check for details in credit card information and reject any discrepancy in the information.

### **The Internet**

Internet is the world's largest computer network. The internet is a network or more precisely "Inter-network" of hundreds of connecting networks made up of different types of computers all over the world that can share messages and information with one another. Internet is a global network of computers. The Internet has revolutionized the computer and communications world like nothing before. Anybody can access the Internet and can use the resources available on the Internet. The Internet is a worldwide, publicly accessible series of interconnected computer networks that transmit data by packet

switching using the standard Internet Protocol (IP) It is a “network of networks” that consists of millions of smaller domestic, academic, business, and Government networks, which together carry various information and services, such as electronic mail, online chat, file transfer, and the interlinked web pages and other resources of the World Wide Web [WWW]

INTERNET  
“Internet is a super market of information”

**Purposes of Internet are as follows:-**

1. Sending and receiving E-mails (It is an instantaneous way of sending and receiving Messages, called electronic mail) round the world at minimal price
2. Finding information on any topic or can be used as an educational tool.
3. Helps in participating in discussion on wide range of topics
4. Used to send data in the form of files from one computer to other with the facility called FTP [File Transfer Protocol]
5. It is used for research purpose.
6. Internet provides a great learning experience

**Intranets**

An intranet is an internal, secured business environment, which uses HTML and TCP/IP protocols like the Internet, but operates on a LAN [Local Area Network].

**Extranet**

Extranet is a business to business intranet that allows limited controlled, secure access between a company’s internet and authorized users from remote locations. The information stored on the web of one organization can be shared by other organizations if they are in good terms. Extranet is also a private network of an organization. However, it allows trusted external partners or clients such as suppliers, customers and business partners to access the network. An intranet extended to trusted external parties becomes an extranet. An external party would have limited access to the network compared to an internal employee of the organization.

**World Wide Web**

WWW or World Wide Web is used for people around the world and it would easily link to other pieces of information, so that only the most important data would quickly found by a user. *WWW is a global web in which millions of users are communicating with each other with the help of computers. It is a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents. It is an Internet based computer network that allows users on one computer to access information stored on another through the world wide network.*

**Working of the WWW**

The WWW works on a Client-server approach. Whenever the user wants to retrieve a webpage, the www works as follows:

1. A user enters the URL of the webpage in the address bar of the web browser.
2. The web browser requests the Domain Name Server for the IP address corresponding to [www.yahoo.com](http://www.yahoo.com)
3. After receiving the IP address, the browser sends the request for the webpage to the Internet using HTTP protocol which specifies the way the browser and Web Server communicates. The Internet Routers send the request to the intended web server
4. Then the web server receives the request using HTTP protocol. It then examines the hard disk or memory and if the requested file is found it returns it back to the web browser and closes the Http connection.
5. The Web browser then interprets the file and displays the contents of the webpage in the browser window.

**Voice over IP [VoIP]**

*Voice over Internet Protocol [VoIP] is simply the transmission of voice traffic over IP based networks.* The internet Protocol (IP) was originally designed for data networking. The success of IP in becoming a world standard for data networking has led to its adaption to voice networking. Thus, Voice over Internet Protocol (VoIP) is a technology that allows making voice calls using a broadband Internet connection instead of a regular phone line. VoIP is one of the new technologies that have the capability to dramatically change the telecommunications scene of tomorrow. VoIP is a technology that helps people

to use the Internet as a transmission medium for telephone calls. By using VoIP, callers can avoid long distance phone charges and save expensive telephone infrastructure costs.

## VoIP Telephones

There are three methods of connecting to VoIP network

1. Using a "normal" telephone with a VoIP adapter: It is through the use of a device called an ATA {Analog Telephone Adaptor}.The ATA allows us to connect a standard phone to computer or Internet connection for use with VoIP. The ATA is an analog-to-digital converter. It takes the analog signal from traditional phone and converts it into digital data for transmission over the INTERNET.

2. Using a VoIP telephone: these specialized phones look like normal phones with a handset, cradle and buttons. But instead of having standard RJ-11 phone connectors, IP phones have an RJ-45 Ethernet connector. IP phones connect directly to our router and have all the hardware and software necessary right onboard to handle IP call. Wi-Fi phones helps to subscribe callers to make VoIP calls from any wi-fi hot spot.

3. Using a computer with speakers and a microphone

This is certainly the easiest way to use VoIP. We need not even have to pay for long distance calls. All that is required is software, microphone, speakers, a soundcard and an Internet connection. A broadband [high speed internet] connection is required for VoIP technology. This can be through a cable modem, or high speed services such as DSL or a local area network. A computer, a adaptor, or a specialized phone is required./ Some VoIP services only work over your computer or a special VoIP phone, while other services allows to use a traditional phone connected to a VoIP adaptor.

### Benefits of VoIP

- Low cost
- Eliminating phone lines
- Increased functionality and Reliability
- Eliminating Long Distance Charges
- Number portability
- Computer Telephony Integration [CTI]

## The Internet Standards

At the technical and developmental level, the Internet is made possible through creation, testing and implementation of Internet Standards. These standards are developed by the Internet Engineering Steering Group, with appeal to the Internet Architecture Board, and promulgated by the Internet Society as international standards. The RFC Editor is responsible for preparing and organizing the standards in their final form. The standards may be found at numerous sites distributed throughout the world, such as the Internet Engineering Task Force. An Internet Standard [STD] is a normative specification of a technology or methodology applicable to the Internet. Internet Standards are created and published by the Internet Engineering Task Force [IETF].An internet Standard is a special Request for Comments [RFC] or set of RFCs. The definitive list of Internet Standards is maintained in Internet Standards document STD

## INTERNET PROTOCOLS

A communication protocol allows different kinds of computers using different operating systems to communicate with one another. It is highly essential because Internet is not made up of computer system. Instead there are great diversities found in the computers used on the internet. The user connected on any network on the Internet can communicate with others or software located on any other network connected to the internet using common set of protocols. *An internet protocol is a set of standards or rules for exchanging information between computer systems in a network.* The most commonly used protocols are: -

### 1. Transmission control Protocol/Internet Protocol [TCP/IP]

*It is actually a collection of protocols that govern the way data travel from one computer to another across networks.* A user connected on any network on the Internet can communicate with people or software located on any other network connected to the internet using this common set of protocols. On the internet, the protocol that permits two internet connected computers to establish a reliable connection is called TCP/IP.

### 2. File Transfer Protocol [FTP]

*FTP is the protocol or set of rules, which enables files to be transferred from one computer to another computer.* FTP works on the client/server principle. A client program enables the user to interact with a server in order to access information and services on the server computer. Files that can be transferred are stored on server computers. A client can access these files only through a client application program.

This program helps a client computer to locate the required file to be transferred and starts the process of transfer.

### **3. Hyper Text Transfer Protocol [HTTP]**

*HTTP is an internet standard or set of rules that allows the exchange of information on the World Wide Web. Hyper text is a method of preparing and publishing text, ideally suited to the computer, in which users can select their own text.* To prepare hyper text, the whole material should be divided into small segments such as single pages of text. These small segments are called nodes. Then hyper links are embedded in the text. When the user clicks on a hyper link, the hyper text software displays a different node. The process of navigating among the nodes linked in this way is called browsing. A collection of nodes that are interconnected by hyper links is called a web. A Hyper text is prepared using Hyper Text Markup Language [HTML]. The html codes are used to create links. Http is also based on the client/server principle. It allows the client computer to contact with server computer and make a request. The server accepts the connection requested by the client and sends back a response. An Http request identifies the information or text that the client is needed and it tells the server to supply the text.

### **4. Telnet**

*Telnet is an Internet protocol or set of rules that enables internet users to connect to another computer linked to the internet. This process is also called as remote login.* The user's computer is referred to as the local computer and the computer being connected to is referred to as remote or host computer. Once access is established between local and host computer, local computer can give commands do that they are executed in the host computer.

### **5. Gopher**

*Gopher is a protocol linked to the internet to search, retrieve and display documents from remote sites on the internet, It is a menu based program that helps the user to find files, programs, definitions and other topics that the user specifies.* Gopher protocol allows the user to free from the troubles of specifying the details of host, directory and file names. Instead, the user can browse through menus and press Enter when he finds some interesting topic. Gopher is interacting with a large number of independently owned computers around the world.

### **6. Wais**

Wais stands for Wide Area Information Service. WAIS is a internet search tool and describes as a protocol for computer to computer information retrieval. *It is a program that permits the user to search information worldwide based on a service of key words.* WAIS has the capability of simultaneously searching in more than one database.

### **Service oriented Architecture [SOA]**

*Service oriented Architecture is an information technology approach in which applications make use of services available in a network such as the World Wide Web. Implementing service oriented architecture can involve developing applications that use services, making applications available as services so that other applications can use those services, or both.*

SOA is an approach to connect various applications so that they can communicate with each other. It is a way of sharing functions, typically business functions, in a widespread and flexible way. It is an architectural style which aims at to achieve loose coupling among interacting software agents. A service is a unit of work done by a service provider to achieve desired end results for a service consumer. Both provider and consumer are roles played by software agents on behalf of their owners.

What distinguishes an SOA form other architectures is loose coupling. Loose coupling means that the client of a service is essentially independent of the service. The way a client communicates with the service doesn't depend on the implementation of the service. This means that the client does not have to know very much about the service to use, it. Loose coupling enabling services to be document oriented. A document oriented service accepts a document as input, as opposed to something more granular like a numeric value or java object. The client does not know or care what business function in the service will process the document. It is up to the service to determine what business function to apply based on the content of the document

An SOA can also include a service that provides a directory or registry of services. The registry contains information about the service such as its interface. A client can discover services by examining the registry. A registry can also be coupled with a repository component that stores additional information about each service

## **Future of the Internet Infrastructure**

The future of any technology is difficult to forecast, and we do not profess to know what the future holds for the Internet. The Internet has revolutionized the access of information and communication in 1990's. The ongoing development in speed, bandwidth, and functionality will continue to cause fundamental changes in the world for decades to come. Some of the major trends shaping the future of the Internet are as follows:-

### **1. Globalism: -**

The future of the Internet global distribution of information and knowledge at lower and lower cost will continue to lift the world community for generations to come. People will have access to any information they wish, get smarter sooner, and be more aware of the world outside their local environment. A better informed humanity will make better macro- level decisions, and an increasingly integrated world will drive international relations towards a global focus.

### **2. Communities: -**

This internet communication revolution results into a new uniting community. The Internet will increasingly be used for communications within communities as much as across countries. Local communities will organize in virtual space and take increasing advantage of group communication tools such as mailing lists, new groups, and web sites, and towns and cities will become more organized and empowered at the neighbourhood level.

### **3. Virtual Reality**

With the continued increase of computer capability every couple of years, the ability of technology to process the complex environment that humans live in – “ reality” – will continue to increase, and will be increasingly integrated with the Internet.

Three dimensional graphics will become more sophisticated, and virtual reality interfaces such as viewers and physical feedback systems will become more realistic. The increasingly sophisticated virtual experiences will continue to change how we understand the nature of reality, experience, art and human relations.

### **4. Bandwidth**

Large increases of bandwidth in the 10 Mbps range and up will continue to be deployed to home users through cable, phone and wireless networks. High resolution audio, video, and virtual reality will be increasingly available online and on demand, and the cost of all kinds of Internet connections will continue to drop.

### **5. Wireless**

The future of Internet wireless communication is the endgame. Wireless frequencies have two great advantages. (a) There are no infrastructure start-up or maintenance costs other than the base stations and (b) it frees users to become mobile, taking Internet use from one dimension to three. Wireless Internet Networks will offer increasingly faster services at vastly lower costs over wider distances, eventually pushing out physical transmission systems.

### **6. Grids.:-**

The future of the Internet grid movement is as inevitable as the spread of the Internet seems now. The connection of thousands of computers on the Internet together to solve problems, often called grid computing will continue to evolve and change many areas of human Endeavour.

### **7. Integration**

The integration with an increasing number of other technologies is as natural as a musician's experimentation with notes. The internet will become increasingly integrated with phones, televisions, home appliances, portable digital assistants, and a range of other small hardware devices, providing an unprecedented, nearly uniform level of integrated data communications. Users will be able to access, status, and control this connected infrastructure from, anywhere on the Internet.

# CHAPTER 3 – MARKETING STRATEGIES AND E-COMMERCE

## CONTENTS

Website

Corporate website

Web portal

Search engine

Internet advertising

Mobile commerce

## Web sites

A website is very essential to conduct e-commerce. The success or failure of e-commerce to a greater extent is determined by the setting up of a suitable website and its promotion to attract customers from all over the world. A website is similar to storefront. In e-commerce context, it can be called as virtual storefront where cyber customers visit. A website is basically a series of pages with links to other pages or other sites. The pages contain text, banners, graphics and sometimes audio and video.

The World Wide Web [WWW] was created in 1989 by CERN physicist Tim Berners Lee. On 30<sup>th</sup> April 1993, CERN announced that the World Wide Web would be free to use for anyone.

### Components of a Website

E-commerce providers must take every opportunity to convey their professionalism in their website, products and services to their customer service as each will play an important part in their success. The important components of a website are as follows: -

#### 1. Home page

This is the first page of a web site. The user reaches this page when they specify the address of a web site. It contains links and these links help the user to navigate the different parts of a site. It shows the name of the company and other important details.

#### 2. Web page

A web page is used to display some specific information regarding each item or element described in the home page. The web pages can be accessed by using links given in the home page.

#### 3. Domain name

It is highly essential to have a domain name for a web site. In order to establish credibility, it is better to have our own domain name and professional web hosting. Web sites hosted on free servers are not taken seriously and will suffer a serious loss of business. Visitors may feel that the company don't have even its own domain and hence may not be a credible company. They will simply take their business elsewhere.

#### 4. Professional Logo

A professional looking logo is an integral part of a web site. It not only gives a professional appearance to web site, but it will also enable our visitors to recognize brand. The logo should be displayed in the top left corner of each page of web site.

#### 5. Theme based content

A web site should focus on a specific subject and provide a variety of information that relates to the subject. Original content is always preferable.

#### 6. E-mail capture

A web site should be able to capture email address of potential customers.

#### 7. Privacy policy

We can create our own page on the web site called "Privacy" and let our visitors know exactly how we will be using the information collected from them. Such a page should contain warning to visitors regarding security and privacy of information they provide.

#### 8. Testimonials

To increase credibility, it is better to include customer's testimonials which include customer's name, e-mail address and web address.



### Meaning of website

Website is a set of related websites served from a single domain name. It is a document written in plain text interspersed with formatting instructions of HTML.

### **9. Money back guarantee**

Providing the customers with a solid, no risk, money back guarantee will increase credibility so that it completely removes our potential customer's risk. This will put their mind at ease by building their confidence with our company and products.

### **10. Feed back**

Potential customers will have many questions about our products and services. It is better to use a feedback form for this purpose.

### **11. Copy rights**

It is always good to display the copyright information at the bottom of each page.

### **12. Link**

A link is a connector that makes it possible to go to another web page on the site or the Internet or to go back to the home page. A link has a specific title and directions for use.

### **13. Banner**

A banner is a graphic display on a web page usually used for advertising. The banner is usually linked to the advertiser's web page.

## **Concept and Designing Website for E-commerce**

Usability considerations should be of prime importance in the design of an electronic commerce website. The human mind processes new information based on observations and inferences and gradually he forms a conceptual or mental model. The design of an e-commerce website incorporates activities, ideas, terminology, and relationship that the user must handle when using the website. A conceptual model is the basis for user expectations. When a new user enters an e-commerce website, he quickly starts to build a conceptual model that relates the website to what he already knows. A user will perceive a website as easy to navigate and thus user friendly, if he can easily construct a conceptual model of the website, if a website requires a complex conceptual mode, the user sees the web site as confusing or difficult to use. The challenge for the website designer is to come up with a design model and a system image that are consistent with the user's model of the website. The purpose of a website is to support and enhance the goals of a business or organization. It is not an end in itself. A website should be much more than just an online brochure, and a well designed web site integrates the following key concepts:-

### **1. Information Presentation**

The information should be presented in such a manner that it should promote a comfortable and effective interaction between the user and the site. The web site developer has many ways to present information from simple text to multimedia displays. Selection and use of text, graphics, video, and audio depend on how well users will respond to the information.

### **2. Good navigation and usability**

Good navigation and usability is another basic concept for a good website design. It should always possible for the visitors to navigate from one part of the website to the other easily.

### **3. Feedback**

The interactive cycle between a user and a website is not complete until the website responds to a command entered by the use. Website feedback often consists of a change in the visual or verbal information presented to the user. Completed orders should be acknowledged quickly. This may be done with an acknowledgement or fulfilment page. The amount of time it takes to generate and download this page, is a source of irritation for many e-commerce users.

### **Design criteria**

A good website is a medium to present our business. In designing website, the primary goal is to attract visitors through the presentation of information and thereby distributes or sells products to them. Therefore, the important criteria that is to be followed while designing a website includes the following:-

- **The purpose of the site** – should be to communicate the information about the business which includes information such as location, hours, contact information, products and services etc.
- **Good domain name** – domain names are the best if they are .com (commercial) names for businesses. This allows the person to type in just the main words or words and the site will come up
- **Visibility** – important website information should always fit within the typical horizontal viewing area of the screen

- **Good coolers and graphics** – it is used to get the visitors attention quickly and let links give them more detailed information. Good graphics should also be used so as to make the site more attractive.
- **Good texts**- simple and straight forward style should be used while giving details about our business. Reading text on complex background can make our information very difficult to read and understand.
- **Pictures or Images**- it add attraction to the site. A good picture of business place or logo can be shown in the site. Pictures or images of company's products must be given in the site so that the customers who visit the site can actually see ht products offered.
- **Good Meta tags** – are read by Search Engines and should include at a minimum, the page title, and the name of the business, description of the business, the location, and key words.
- **Quick to load** – the home page of the site should load quickly and be easy to understand. Large pictures, moving graphics etc. will ion crease the load time.
- **Easy to navigate**- it should be possible to navigate easily from one part of the site to other or from one piece of information to other areas of information.
- **Current content** – the information should always be current and updated. Old information will make our website outdated. Information in the website should be updated in a timely manner.
- **Leads**- It is also essential to generate leads, sales or customer list. This can include simple forms for the customer to fill out giving their information or shopping carts so that product can be sold without our intervention.
- **Ability to bring people back** – it is better to create a mailing list of customers so that we can contact current customers and contacts from our site with updated information inviting them back to visit.
- **Post site Built Scenario**-It is advisable to read the site by many in order to avoid great mistakes and make sure that it is submitted to major search engines. Then add our site address to our email signature. It is also essential to add the URL of our advertising materials.

### **Corporate Web Site**

*A corporate website or corporate site is an informational website operated by a business or other private enterprise such as a charity or non-profit foundation. They differ from electronic commerce sites in that they provide information to the public about the company rather than transacting business or providing other services. The phrase is a term of art referring to the purpose of the site rather than its design or specific features, or the nature, market sector, or business structure of the site operator.*

### **Portal**

*A Web portal, also known as links page, presents information from diverse sources in a unified way. Portals provide a way for enterprises to provide a consistent look and feel with access control and procedures for multiple applications and databases, which otherwise would have been different entities altogether. A web portal is a web site that provides a gateway, or portal, to other resources on the Internet. Portals are often the first page when we start up our web browser like Netscape Navigator or Internet Explorer. The scope and coverage of the portals are*

### **Contents of a Corporate Web site**

1. A home page
2. A navigation bar or other means for accessing various site sections
3. A unified look and feel incorporating the company logos, style sheets, and graphic images
4. An "about us" section with the following information
  - A summary of company operations, history and mission statement
  - A list of the company's products and services
  - A section with biographical information on founders, board members, and important executives. Sometimes provides an overview of the company's overall workforce.
  - A "news" section containing press releases and links to news articles about the company
  - A "investor" section describing key owners and investors of the company
  - A list of key clients, suppliers, achievements, projects, partners or others.

very wide and hence the term search engine is not sufficient to describe the multi offerings provided by portals. Eg. Yahoo, MSN, ALO , iGoogle etc.

Sites listed as portals contain the following features:-

- Search Engine/ Directory
- E-mail Accounts
- News
- Sports and Weather

### Types of Portals

1. **Vertical Portal:** These are web portals which focus only on one specific industry, domain or vertical. Vertical portal simply provides tools, information, articles, research and statistics on the specific industry or vertical. A Vertical information Portal [VIP] is a specialized entry point to a specific market place and or industry niche. Eg. i-village- meant for women and guru.com for independent professionals

2. **Horizontal portal:** They are general interest portals covering a wide range of topics and features such as yahoo or Google. These are mega portals dealing in a wide range of topics.

3. **Enterprise Resource portals or corporate portals:** It provides personalized access to an appropriate range of information about a particular company. Big corporations may set up their own portals in order to meet their various requirements ranging from planning to control of various functions. Initially called Intranet portals - enterprise portals existing for the benefit of the company own employees, this set of technologies has developed to assist and provide access to a company's business partners as well.

4. **B2B portals:** A portal that helps to establish relations and to conduct transactions between various organizations is termed as B2B portals. Large volume of business is being undertaken through these channels, a company which maintains a portal can earn profit if they participate in the ownership of the website or charge a transaction fee for business done through the portal.

5. **Application Centric Portals:** These portals function as a one of tying together back end systems to support user's application driven business processes. Users could be viewing the information as read only or able to create, modify, delete, expire information based on rights and permissions – but they are essentially using the portal to attach a number of applications into one view – so that rather than having to open a number of different applications to drive their business processes they are able to access them all from one point.

6. **Content Centric Portals:** These portals function as one of obtaining information from a wide variety of sources and displaying that content to users in a way that is based upon user's role and segmented information needs. These are designed to improve the access to and sharing of information stored within an organization.

7. **Knowledge Portals:** These portals increase the effectiveness of knowledge workers by providing easy access to information that is necessary or helpful to them in one or more specific roles. Knowledge portals are not mere intranet portals since the former are supposed to provide extra functionality such as collaboration services, sophisticated information discovery services and knowledge map.

### Search Engines

*A search Engine is an Internet based interactive search device that enables a user to search for information on the Internet. Web search Engines are actually database that contain references to thousands of resources. A search Engine is software that scours the Internet collecting data about every website and every web page within a web page that it can. The database of most Internet Search Engines contains web documents. A web search Engine provides an interface between the user and database. A search Engine is interactive and it asks a user to type a search string, which may be a word, a phrase, a date or some relevant item associated with the information. The search begins the searching operation with these key words and continues searching it comes across a list of resources that matches the keyword. Many search engines include instructions and tips to search the databases more effectively.*

### WORKING OF SEARCH ENGINE

Search Engines for the general web do not really search the World Wide Web directly. Each one searches a database of the full text of web pages selected from the billions of web pages out there residing on servers. When you click on the links provided in a search Engine's search results, you retrieve from the server the current version of the

#### Popular Search engines

- Alta vista
- Yahoo
- MSN
- Ask.com
- Dogpile
- Metacrawler
- Lycos
- Hotbot
- Google

page. Search Engines databases are selected and built by computer robot programs called spiders .They crawl the web in their hunt for pages to include. They find the pages for potential inclusion by following the links in the pages they already have in their database. They cannot think or type a URL or use judgment to decide to go look something up and see what’s on the web about it.

If a web page is never linked to in any other page, search engine spiders cannot find it. The only way a brand new page – one that no other page – one that no other page has ever linked to – can get into a search engine is for its URL to be sent by some human to search engine companies as a request that the new page be included. All search Engine companies offer way to do this. After spiders find pages, they pass them on to another computer program for “indexing”. This program identifies the text, links and other content in the page and stores it in the search engine’s databases files so that the database can be searched by keyword and whatever more advanced approaches are offered, and the page will be found if your search engine matches its content. Some types of pages and links are excluded from most search engines by policy. Others are excluded because search engine spiders cannot access them. Pages that are excluded are referred to as the “Invisible Web” – what you don’t see in search engine results. The invisible web is estimated to be two to three or more times bigger than the visible web. When you enter the key word search engine examines its database and gives a listing of sites that match the search criteria. The hundreds or thousands of search engine results are referred to as Hits□ Google

### **Internet Advertising**

*Internet advertising is a new advertising medium. Internet advertising or online advertising is a form of promotion that uses the Internet and World Wide Web for the expressed purpose of delivering marketing messages to attract customers.* It is a way for retailers to advertise their products and services online. Ads can target people with particular hobbies or interests, or they can even focus on customers in a specific country or state. One major benefit of online advertising is the immediate publishing of information and content that is not limited by geography or time. Another benefit is the efficiency of advertiser’s investment. Online advertising allows for the customization of advertisements, including content and posted websites.

### **Models of Internet Advertising**

1. **Banner Ads:** It appears as rectangular graphics near the top of the page. Banner Ads have been used for many years and are the most popular form of advertising on the web.
2. **Floating Ads:** These ads appear when we first go to a web page, and they “float” over the page for five to 30 seconds. While they are on the screen, they create difficulty to our view of the page and often block the mouse input as well.
3. **Interstitials:** These are form of advertisement on the web that appears between web pages that the user requests. These appear as pop-up windows displaying a message.
4. **Unicast Ads:** A unicast ad is basically a TV commercial that runs in the browser window. It has enriched Audio/ video content. The ads can last anywhere from 10 to 30 seconds
5. **Takeover Ads:** Viewers visiting the website will see a large ad when they first come, and then the continuity is maintained by reiterating the same message throughout the site in the form of banners, side bars or buttons.
6. **Contextual Ads:** This is a type of online advertising commonly used for content based websites. With contextual advertising, targeted Ads appear based on the page’s actual content
7. **Rich Media Ads:** This is another form of banner advertising. Banners that are animated contain audio or video, or just flash, blink or make weird sounds belong to this type
8. **Advertorials:** Advertisements take the form of website copy. Similar to an infomercial in the way it portrays goods or service and then proceeds to offer it to you.
9. **E-zines:** It resembles online magazines generally covering a topic of interest.
10. **Newsletters:** These are similar to E-zines; these give more industry related news and company updates.

### **Benefits of Internet Advertising**

- Rich content
- Less expensive
- Quick updating
- Provides Brand relevant information
- Easy collection of data
- Global accessibility
- Greater flexibility
- Better Customer Relation
- Persuasive Ad
- Facilitate Purchase Decision

11. **Press releases:** It provides newsworthy information that can be picked up for newspapers, magazines and industry related news sites.

## **Weakness of Internet Advertising**

### **1. Not a substitute for traditional Advertising**

Internet advertising is not a substitute for traditional advertising models such as print advertising and TV advertising. Internet advertising will rapidly lose its value and its impact.

### **2. Unsolicited in nature**

Pushing a message at a potential customer when it has not been requested and when the customer is the midst of something else on the net will fail as a major revenue source for most internet sites.

### **3. Misdirection**

It means sending customers to web locations other than the one for which they are searching. Monetization of misdirection frequently takes the form of charging companies for key words and threatening to divert their customers to a competitor if they fail to pay adequately for key words that the customer is likely to use in searches for the company's products.

### **4. Emergence of contextual mobile ads.**

At present contextual ads delivered to mobile phones through SMS. This has resulted in the reduction of popularity of Internet advertising.

### **5. Cluttered Appearance**

Advertising that is disorganized and difficult to read, as well as presenting too much information at one time, often turns viewers off.

### **6. Not suitable for all products and services**

Internet advertising is particularly suitable for products like music and books which can be successfully advertised through social networking sites such as face book and My space.

### **7. Less Dependable**

Because of large number of SPAM and unsolicited emails that are sent out, users can have difficulty to distinguish between genuine advertising and false adverts and therefore the trustworthiness of advertisements is brought into question.

## **Emergence of Internet as a competitive Advertising Media**

Interviews with marketers reveal that few believe the Internet will change their approach to advertising. Most see it as little more than a complement to traditional marketing practices, and don't expect it to reduce expenditure on broadcast and print media or change the form, pricing, or delivery of advertisements. It is probably a reaction to the early type of Internet and the World Wide Web

Internet Advertising will account for a growing proportion of overall advertising expenditure. Moreover, advertising – and marketing in general – will adopt practices first developed or deployed on the Internet. As the technology improves, the impact of internet advertising will increase and become easier to measure, and the gap between the new precise, interactive marketing capability and conventional “fizzy” passive media will widen. Over the next few years, advertising agencies and consumer marketers will be under pressure to change their whole approach to marketing communications. Marketers will become more accountable for their results, and they will pay more attention to building a total customer relationship. Offering consumers value in return for information will become vital in eliciting their preferences. Companies' entire marketing organizations will be progressively redesigned to reflect interactions with consumers on the Internet. For ad agencies, fees based on results will become standard. The economics of Internet advertising are likely to make current business models obsolete.

Classical advertising strategies such as positioning, brand essence, and niche marketing are much more important when advertising on the Internet. The strength and weakness of the medium should be considered for advertising on the net. Internet advertising is always easier than the real world advertising. Web banner displays and mass emailing cost almost nothing. Space for advertising on the Internet can be bought very cheaply. A company should take advantage of the fact that there are so many opportunities to reach potential customers, and come up with a diverse advertising strategy. They should maximize hits to websites offering to sell whatever product they market. They should place references to their product wherever they can. Most of all, advertising on the Internet should incorporate a wide range of different fields meant to appeal to different possible customers.

## **MOBILE COMMERCE**

*Mobile commerce or M-commerce refers to transactions that are carried out with the help of an electronic device like cell phone. M-commerce is the buying and selling of goods and services through wireless handheld devices such as cellular phone and Personal Digital Assistants [PDAs]*

Mobile commerce is any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer – mediated networks with the help of an electronic device. Mobile commerce was born in 1997 when the first two mobile phone enabled Coco Cola vending machines were installed in the Helsinki area in Finland. They use SMS text messages to send the payment to vending machines. Mobile commerce has two distinctive advantages of flexibility and ubiquity.

**The products and services available through M-commerce includes:-**

- Mobile ticketing
- Mobile vouchers, coupons and loyalty cards
- Content purchase and delivery
- Location based services
- Information services
- Mobile banking
- Mobile brokerage
- Auctions
- Mobile purchase
- Mobile marketing and advertising

# CHAPTER 4 – ELECTRONIC PAYMENT SYSTEM

## CONTENTS

*Online payment system*

*Prepaid and post paid payment system*

*E cash, E cheque, debit card, credit card, smart card, Electronic purse*

*Security issues*

*Bio metrics*

## Electronic Payment system

*Electronic Payment system is a financial exchange that takes place online between buyers and sellers. The content of this exchange is usually some form of digital financial instrument {such as encrypted credit card numbers, electronic cheques or digital cash} that is backed by a bank or an intermediary, or by a legal tender. The various factors that have led the financial institutions to make use of electronic payments are:-*

1. Decreased technology cost
2. Reduced operational and processing cost
3. Increasing online commerce

## The Internet Payment Processing System

The *participants* in an online electronic payment transaction include the following:-

1. **The Customer:** -Customer in an e-commerce may be the holder of a payment card such as credit card or debit card from an issuer
2. **The issuer:** -The issuer means a financial institution such as bank that provides the customer with a payment card .The issuer

is responsible for the card holder's debt payment.

3. **The Merchant** – The person or organizations that sells goods or services to the cardholder via a website is the merchant. The merchant that accepts payment cards must have an Internet Merchant account with the acquirer

4. **The acquirer** – is a financial institution that establishes an account with the merchant and processes payment card authorizations and payments. The acquirer provides authorization to the merchant that given card account is active and that the proposed purchase doesn't exceed the customer's credit limit. The acquirer also provides electronic transfer of payments to the merchant's account, and is then reimbursed by the issuer via the transfer of electronic funds over a payment network.

5. **The Processor** – The Processor is a large data centre that processes credit card transactions and settles funds to merchants, connected to the merchant on behalf of an acquirer via a payment gateway.

## Basic steps of an online payment

The basic steps of an online payment transaction include the following: -

- The customer places an order online by selecting items from the merchant's Website and sending the merchant a list. The merchant often replies with an order summary of the items, their price, a total, and an order number
- The customer places an order along with their credit card information and sends it to the business. The payment information is usually encrypted by an SSL pipeline set up between the customer's web browser and the merchant's web server SSL certificate.
- The merchant confirms the order and supplies the goods or services to the customer. The business sends the consumer an invoice, their certificate and their bank's certificate.
- The business then generates an authorization request for customer's credit card and sends it to their bank
- The business's bank then sends the authorization request to the acquirer
- The acquirer sends an acknowledgement back to the business's bank after receiving an acknowledgement from the customer's Bank.
- Once the consumer's bank authorizes payment, the business's bank sends an acknowledgement back to the business with an authorization number

## **Various Online Payment Systems**

### **1. Electronic Tokens**

An Electronic token is a digital analog of various forms of payment backed by a bank or financial institution. There are two types of tokens:-

1] Real Time (or Pre-paid tokens) – These are exchanged between buyer and seller, their users pre-pay for tokens that serve as currency. Transactions are settled with the exchange of these tokens. Eg. Digicash , Debit Cards, Electronic Purse etc.

2] Post Paid Tokens – are used with fund transfer instructions between the buyer and seller. Eg. Electronic Cheques, Credit card data etc.

### **2. Electronic or Digital Cash**

This combines computerized convenience with security and privacy that improve upon paper cash. Cash is still the dominant form of payment as: The consumer still mistrusts the banks. The non cash transactions are inefficiently cleared. The properties of Digital cash are: -

- Must have a monetary value
- It must be backed by cash [currency], bank authorized credit or a bank certified cashier's check
- Digital cash is based on cryptographic systems called "Digital Signatures" similar to the signatures used by banks on paper cheques to authenticate a customer.
- Maintenance of sufficient money in the account is required to back any purchase.
- Must be interoperable or exchangeable as payment for other digital cash, paper cash, goods or services, lines of credit, bank notes or obligations, electronic benefit transfers and the like.

### **3. Electronic Cheques**

The electronic cheques are modelled on paper checks, except that they are initiated electronically. They use digital signatures for signing and endorsing and require the use of digital certificates to authenticate the payer, the payer's bank and bank account. They are delivered either by direct transmission using telephone lines or by public networks such as the Internet.

Integration of the banking and the information technology industry has benefitted the consumers in many aspects with respect to time, cost and operational efficiency

## **PREPAID AND POST PAID PAYMENT SYSTEMS**

Electronic payment systems are broadly classified in to prepaid and post paid payment systems:

### **A] Prepaid payment systems**

It provides a service that is paid prior to usage. Here the customer is allowed to spend only up to the amounts that have pre-determined into the account. This type of payment system is highly useful to those customers who would like to control overspending. E.g. Prepaid debit cards or prepaid credit cards. Prepaid payment system is taken by the customer by depositing money with the credit given company. It can be deposited in the savings account or the current account. Once the money is deposited, the card is used as a regular credit card. It is very effective card as it doesn't put in to debt. Once the money is exhausted in the account, the credit card cannot be used. There is no interest charges related to this card.

### **Benefits of the pre-paid payment system**

1. It is accepted at the entire merchant establishment worldwide according to the affiliation of the credit given company.
2. It can be used to withdraw cash from the ATMs
3. Reloadable anytime anywhere
4. It can be used to withdraw cash in any international currency
5. It is usually backed up by personal accident insurance cover
6. Customer has the facility to get online and track spending , check balance, change pin

### **Post paid Payment System**

This system is like a credit card used to make incremental purchases through the web site. As purchases are made, the accumulated debt on the post paid credit instrument increase until a credit limit is reached, or until an arrangement has made to settle the debt such as monthly payment. Normally all credit cards are post paid cards. The customer gets the eligibility of spending through the income statement and credit history produced before the credit card company. The customer gets a credit limit and a credit period by which the customer is supposed to pay back the money to the credit card company.

## **Features of Post paid payment system**

- Global acceptance – accepted by all the merchant establishments according to the network set by the credit card company.
- Balance transfer option – It is possible to transfer outstanding funds from one card to other cards with low interest rates.
- Revolver facility – Customer can pay only a small amount of the total outstanding and revolve the rest for the payment of the next month.
- Cash advance facility – Customer can withdraw around 30% of the credit limit at any ATM connected to the credit card company
- Tele draft – These facilities are available at the door steps of the customer
- Other services – Credit card can be used for railway tickets and airline ticket purchase
- Convenience – as the customer is not required to carry cash for any purchase
- Easy availability – holder can load prepaid credit cards at anytime they need.

## **E-Cash or Electronic cash**

E-Cash or Electronic Cash is a new concept to execute cash payment using computers connected with network. E-cash is an electronic medium for making payments. The primary function of e-cash is to facilitate transactions on the Internet. Many of these transactions may be small in size and would not be cost efficient through other payment medium such as credit cards. Electronic money [also known as e-currency, e-money, electronic cash, electronic currency, digital money, digital cash or digital currency] refers to money or scrip which is exchanged only electronically. Typically, this involves the use of computer networks, the internet and digital stored value systems. Electronic Fund Transfer and direct Deposit are all examples of electronic money.

E-cash is a system of purchasing cash credits in relatively small amounts, storing the credits in our computer, and then spending them when making electronic purchases over the Internet. The e-cash is the creation of electronic money or tokens, usually by a bank, which buyers and sellers trade for goods and services. It consists of a token, which may be authenticated independently of the issuer. This is commonly achieved through the use of self-authenticating tokens or tamper proof hardware. It includes credit cards, smart cards, debit cards, electronic fund transfer etc.

### **An e-cash system must have the following properties:-**

- Digital cash must have a monetary value. It must be backed by cash
- Digital cash must be exchangeable.
- It should be storable and retrievable
- It should not be easy to copy or tamper with while it is being exchanged

## **2. Electronic Cheque**

E-cheques are a mode of electronic payments. Integration of the banking and the information technology industry has benefitted the customers in many aspects with respect to time, cost and operational efficiency. Cheque is the most widely accepted negotiable instrument to settle transactions in the world. Paper cheques provide consumers an important payments mechanism. This technology was developed by a consortium of Silicon Valley IT Researchers and merchant bankers and since then has been promoted by many of the financial bodies. E-cheques work the same way as paper cheques and are a legally binding promise to pay. Electronic cheques are gathered by banks and cleared through existing banking channels, such as automated clearing houses. The advantages of Electronic cheques are: -

- The online merchants could receive payments instantly
- Similar to traditional cheques and eliminates need for customer education
- Much faster
- Less chance for cheque bouncing
- Cost – effective manner

## **3. Credit Cards**

They are the convenient method of making online payment. Credit cards work around the globe regardless of the location of country of the issuing bank. They also handle multiple currencies through a series of clearing houses. The credit card holders can purchase goods and services either offline or online without making immediate payment. Payment to the merchant's will be made by the customer's Bank. The credit card is a financial instrument which can be used more than once to borrow money or buy products and services on credit. It also contains a validity period and other important particulars

#### 4. Smart Card

A smart card is a plastic card about the size of a credit card, with an embedded microchip that can be loaded with data, used for telephone calling, electronic cash payments, and other applications and then periodically refreshed for additional use. A smart card, chip card, or integrated circuit card [ICC] is any pocket sized card with embedded integrated circuits which can process data. The card connects to a reader with direct physical contact or with a remote contactless radio frequency interface. Smart card technology conforms to international standards and is available in a variety of form factors, including plastic cards, fobs, subscriber identification modules [SIMs] used in GSM Mobile phones and USB based tokens. These cards can be used to purchase goods and services. Smart cards are very useful to merchants and consumers to settle the transaction between them. Smart card provides a lot of benefits to consumers. It helps to manage expenditures more effectively, reduce the paper work and ability to access multiple services and the Internet. A multiple application card can support services like health care, travel and financial data access.

★★★★★★★★★★

**The benefits of smart cards for the consumer are the following: -**

1. Security
2. Convenience
3. Flexibility
4. Control
5. International use
6. Interest free loan

★★★★★★★★★★

#### 5. Debit Cards

It is a popular method of making payment. Banks issue debit cards to their customers who have maintained an account in the balance with sufficient credit balance. Each time the customer makes a purchase, an equal amount of the purchase is debited in his account. The transaction works much like a credit card transaction. For E.g. a customer gives an ATM card to the seller for the purchase. The merchant read the card through a transaction terminal and the customer enters his personal identification number. Then the terminal route the transaction through the ATM networks back to the customer's bank for authorization against customer's deposit account. The funds, are approved, are transferred from the customer's bank to the sellers bank.

#### 6. Electronic Purse

Electronic Purse is a card with a microchip that can be used instead of cash and coins for everything from vending machines to public transportation. The Electronic Purse would consist of micro- chip embedded in a credit card, debit card, or stand alone card to store value electronically. The card would replace cash and coins for small ticket purchases such as gasoline stations, pay phones, road/bridge tolls, video games, school cafeterias, fast food restaurants, convenience stores, and cash lanes at supermarkets. Cardholders can "reload" the microchip and control the amount of value stored in the card's memory. The Electronic Purse provides cardholders with the security and convenience of carrying less cash and coins, eliminating the need for exact change.

#### Security issues on Electronic Payment System

It is recommended that the clients instruct their banks to make the transfer of large payments directly to the agency's bank and not use Internet- based payment systems. In common with all other electronic information processing systems, payment systems are prone to disruption by people exploiting the systems innate vulnerabilities. Those considering employing a payments system must decide whether to accept the consequent risks. Data in computers are more liable to destruction, fraud, error and misuse. Since payment information is so valuable its security is all the more important than other kinds of tangible assets in the organizational context. Security refers to the policies, procedures and technical measures and to prevent unauthorized access, alteration, theft or physical damage to information systems. The basic objective of information security is the protection of interests of those involved in online business.

#### Solutions to Security issues

##### 1. Anti-Virus Programs

It is reported that 300 new viruses appear each month and if we are not constantly protecting our system against this threat our computer will become infected with at least one virus. Antivirus software scans computers for signatures of a virus. A virus signature is the unique part of that virus. It can be a file name, how the virus behaves or the size of the virus itself. Good antivirus software will find viruses that have not yet infected your PC and eliminate the ones that have. Antivirus program can be used on the server level itself. Such programs can scan the files that the server receives and looks for patterns that match known malicious software. The antivirus scanners are set to update them automatically.

## **2. Standards for Security of the Products and systems**

Security products require special expertise to design, are complex to build, and are very vulnerable to bugs. The manufacturers guarantee is inadequate for security products unless supported by independent evaluation. Defense signals Directorate has set up an evaluation scheme, the Australasian Information Security Evaluation Programme [AISEP], to test IT security products against international standards. Products which satisfy the standards are certified by DSD and are normally listed on Evaluated Products List.

## **3. Firewalls**

Merchants place firewalls between their installations and their clients. They should also place firewalls between themselves and their payment providers, the financial institutions they use, and in fact, any other installation to which they are connected unless the installation is under their direct control. A network firewall is basically a secure gate between our organizations data and the Internet. The firewall is a combination of hardware and software. The firewall then filters traffic based on our requirements. Firewall security is designed to detect and resists unwanted attempts to penetrate our server security.

## **4. Secure Socket Layer [SSL]**

The standard SSL developed by Netscape provides a high level of protection. Many product manufacturers advertise their use of 56-bit or 128-bit DES encryption and 1024-bit public keys. They can protect against any casual attacks. Browsers that support this feature a dialog box, a padlock in the bottom task bar, or a Blue key to indicate that a secure session is in progress.

## **5. Secure Electronic Transaction [SET]**

SET encrypts payment transaction data and verifies that both parties in the transaction are genuine. SET, originally developed by MasterCard and Visa in collaboration with leading technology providers, has a large corporate backing and is perceived to be more secure as a result of its validation from card companies.

## **6. Public Key software Infrastructure [PKI]**

PKI is similar to bank's night safe in that many public keys can be used to deposit items into the safe, but only one private key, belonging to the bank can make withdrawals.

## **BIOMETRICS**

Biometrics comprises methods for uniquely recognizing human based upon one or more intrinsic physical or behavioural traits. In computer science, in particular, biometrics is used as a form of identity access management and access control. It is also used to identify individuals in groups that are under surveillance. Biometrics characteristics can be divided into two main classes:-

- Physiological are related to the shape of the Body. E.g. Fingerprint, face recognition, DNA, hand and palm geometry, iris recognition
- Behavioral are related to the behaviour of a person. E.g. typing, rhythm, gait, and voice.

Biometrics is the science and technology of measuring and analyzing biological data. Biometrics is automated methods of recognizing a person based on a physiological or behavioural characteristic.

## **Types of Biometrics**

**1. Signature:** Computers can quantify, analyse and compare the different properties of signature to make signature recognition a viable biometric technology. Being based on things that are not visible [pen pressure and velocity], signature based biometric technology offers a distinct advantage over regular signature verification. A Signature based biometric system could mimic our current legally customary acceptance of a signature to simultaneously convey both identity and authority.

**2. Keystroke Dynamics:** The rhythms with which one types at a keyboard are sufficiently distinctive to form the basis of the biometric technology known as keystroke dynamics. Key stroke dynamics unlike other biometric technologies is 100% software based, and it just requires a home computer to operate it.

**3. Hand geometry:** This system requires the subject to place his right hand on a plate where it is photographically captured and measured. Made of 27 bones and a complex web of interconnected joints, muscles, and tendons, the human hand presents a sufficiently peculiar conformation of anatomical features to enable authentication. Airports, prisons, and factories have successfully employed hand geometry system

**4. Finger Print:** It is a forensic criminological technique, used to identify perpetrators by the fingerprints they leave behind them at crime scenes. In modern biometrics, the features of fingerprint called

fingerprint minutiae, can be captured, analyzed, and compared electronically, with correlations drawn between a live sample and a reference sample, as with other biometric technologies.

**5. Facial Recognition:** With good cameras and good lighting, a facial recognition system can sample faces from tremendous distances without the subject's knowledge or consent. It works by two methods; facial geometry or eigenface comparison. Facial geometry analysis works by taking a known reference point, say, and distance from eye to eye, and measuring the various features of the face in their distance and angles from this reference point. Eigen face comparison uses a palette of about 150 facial abstractions, and compares the captured face with these abstract faces.

**6. Eye biometrics [ Iris/ Retina]:** Both the iris and the veins of the retina provide patterns that can uniquely identify an individual. The pattern of lines and colours on the eye are, as with other biometrics, analyzed, digitized, and compared against a reference sample for verification.

**7. Voice Verification** The identity of a person can also be verified with his voice. It is a difficult problem for computers to identify the voice of a person. The prospect of accurate voice verification offers one great advantage. It would allow a remote identification using the phone system without any additional cost.

# CHAPTER 5 – LEGAL AND ETHICAL ISSUES IN E-COMMERCE

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*Security issues in E-commerce*

*Security tools*

*Regulatory framework of E-commerce*

*Information Technology Act-2000*

*Information Technology (Amendment) Act-2008*

## Security Issues in E-commerce

The major security issues with e-commerce include the following:-

**1. Spoofing:** The low cost of web site creation and the ease of copying existing pages makes it all too easy to create illegitimate sites that appear to be published by established organizations. In fact, unscrupulous artists have illegally obtained credit card numbers by setting up professional looking Vstorefronts that resembles legitimate businesses.

**2. Snooping the shopper's computer:** The software and hardware vendors sell their products with security features disabled. Most users may not have adequate knowledge of enabling these security features. This provides a best opportunity for attackers. A popular technique for gaining entry into the shopper's system is to use a tool such as SATAN, to perform port scans on a computer that detect entry points into the machine. Based on the opened ports found, the attacker can use various techniques to gain entry into the user's system. Upon entry, they scan the file system for

personal information, such as passwords.

**3. Sniffing the network:** Attacker monitors the data between the shopper's computer and the server. He collects data about the shopper or steals personal information, such as credit card numbers A request from the client to the server computer is broken up into small pieces known as packets as it leaves the client's computer and is reconstructed at the server. The packets of a request are sent through different routes. The attacker cannot access all the packets of a request and cannot decode the message sent. A more practical location for this attack is near the shopper's computer or the server. Wireless hubs make attacks on the shopper's computer network the better choice because most wireless hubs are shipped with security features disabled. This allows an attacker to easily scan unencrypted traffic from the user's computer.

**4. Guessing passwords:** This style of attack is manual or automated. Manual attacks are difficult and only successful if the attacker knows something about the shopper. Automated attacks have a higher likelihood of success because the probability of guessing a user ID/ password becomes more significant as the number of tries increases. There are tools which can be used to test all the words in the dictionary to know the user ID/ password combinations, or that attack popular user ID/ password combinations. The attacker can automate to go against multiple sites at one time.

**5. Unauthorised Disclosure:** When information about transactions is transmitted in a transparent way, hackers can catch the transmissions to obtain customers sensitive information.

**6. Unauthorised action:** A competitor or unhappy customer can alter a Web site so that it refuses service to potential clients or malfunctions.

**7. Eavesdropping:** The private content of a transaction, if unprotected, can be intercepted when it go through the route over the Internet.

**8. Data alteration:** The content of a transaction may not only be intercepted, but also altered, either maliciously or accidentally. User names, credit card numbers, and dollar amounts sent are all vulnerable to such alteration.

## Types of Threats and sources of threats

The different types of factors behind the threats are as follows:-

\* **Email attachments** – opening an attachment could unleash a virus and they can propagate themselves even without a user double- clicking on them.

\* **VPN tunnel vulnerabilities** – a hacker who works his way into the VPN has free and easy access to the network

\* **Blended attacks** – Worms and viruses are becoming more complicated, and now a single one may be able to execute itself or even attack more than one platform.

\* **Diversionsary tactics** – hackers may strike a set of servers in a target company and then when security administrators are busy securing that, they slip in and attack another part of the network.

\* **Downloading Tactics** - Workers frequently misuse their Internet access in the workplace, downloading games, movies and music and even porn. It opens the network up to attack and sucks up valuable bandwidth.

\* **Supply chain partners Added to the Network** – An administrator may grant access to the network for a partner company and then forget to close that access point when the job is over.

\* **Renaming documents** – A employee could save business critical information in a different file, give it a random , unrelated name and email the information to her home computer, a friend or even a corporate competitor.

\* **Peer to peer applications** – Here, there is implied trust between servers. That means if a user has access to one server, he automatically has access to another server if the servers share trust.

\* **Music and Video Browsers** – These are browsers that automatically will connect the user with related web sites – all without the user’s permission.

## **Security tools**

### **1. Encryption**

Implementation of technology solutions to secure information that travel over public channels can be protected using cryptographic techniques. Cryptography is the process of making information unintelligible to the unauthorized reader. But decryption is a reverse process of encryption, to make the information readable once again. Cryptography techniques make use of secret codes or key to encrypt information. The same secret key is used by the receiver to decrypt the information; A key is a very large number, a string of zeros and ones.

### **2. Digital Signatures**

They are used to verify the authenticity of the message and claimed identity of the sender but also to verify message integrity. A message is encrypted with the sender’s private key to generate the signature. The message is then sent to the destination along with the signature. The recipient decrypts the signature using the sender’s public key and if result matches with the copy of the message received, the recipient can ensure that the message was sent by the claimed originator.

### **3. Digital Certificates**

A digital certificate is an electronic file that uniquely identifies individuals and web sites on the Internet and enables secure, confidential communications. The security of transactions can be further strengthened by the use of digital certificates. Certification Authorities issues digital certificates to users who wish to engage in secure communication. Once sender has provided proof of his identity, the certification authority creates a message containing sender’s name and his public key. This message is known as a certificate, is digitally signed by the certification authority. To get the maximum benefit, the public key of the certifying authority should be known to as many people as possible. The public key of certification authority can be accepted as a trusted third party way of establishing authenticity for conducting e-commerce.

## **Regulatory framework of E-commerce**

The various cyber laws include:-

1. **Electronic and Digital signature Laws** – Comprehensive laws are required so that uniform standards and procedures can be established. These laws relating to Electronic Signatures e.g. the electronic Signatures in Global and national Commerce Act of USA are part of cyber law.

2. **Computer Crime Law** – some countries have enacted legislations that specifically deal with computers crime and yet other has adapted their existing laws to make computer crime an offence under existing states.

3. **Intellectual Property Law** – It includes copyright law in relation to computer software, computer source code etc. Trademark law in relation to domain names, Semiconductor law which relates to the protection of Semiconductor Design and Layouts and Patent law in relation to computer hardware and software.

**4.Data protection and Privacy Laws** – It is pertinent to note that due to the nature of the Internet and the amount of information that may be accessed through it, such legislation is critical to protect the fundamental rights of privacy of an individual. These laws would probably play a vital role, as the dependence on insecure networks such as the Internet grows further.

**5. Telecommunication Laws** – telecommunication systems also fall within the purview of cyberspace and therefore would form an integral part of cyber laws. The word cyber and its relative dot.com are probably the most commonly used terminologies of the modern era. In the information age the rapid development of computers, telecommunications and other technologies has led to the evolution of new forms of transnational crimes known as cyber crimes.

### **Information Technology Act-2000**

The main objective of the Act is to provide legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication and storage of information to facilitate electronic filing of documents with the government agencies. It also involves legal provisions relating to piracy, defamation, advertising, taxation, digital signatures, copyrights and trade secrets in the cyber world. Some of the major provisions contained in the IT

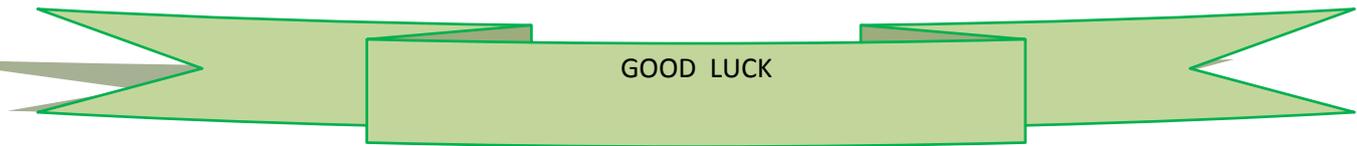
Act are as follows:-

- Electronic contracts will be legally valid
- Legal recognition of digital signatures
- Security procedure for electronic records and digital signature
- Appointment of certifying authorities and controller of certifying authorities including recognition of foreign certifying authorities.
- Various types of computer crimes defined and stringent penalties provided under the Act.
- Establishment of Cyber Appellate Tribunal under the Act.
- Act to apply for offences or contraventions committed outside India.
- Power of police officers and other officers to enter into any public place and search and arrest without warrant
- Constitution of Cyber Regulations Advisory committee who will advise the Central Government and Controller.

### **Information Technology [Amendment] Act, 2008**

Rapid increase in the use of computer and Internet has given rise to new forms of crimes like, sending offensive emails and multimedia messages, child pornography, cyber terrorism, publishing sexually explicit materials in electronic form, video voyeurism, breach of confidentiality and leakage of data by intermediary, e-commerce frauds like cheating by personating – commonly known as phishing, identity theft, frauds on online auction sites, etc. So, penal provisions were required to be included in the Information Technology Act, 2000. Also, the Act needed to be technology neutral to provide alternative technology of electronic signature for bringing harmonization with Model Law on electronic Signatures adopted by United Nations Commission on International Trade Law [UNCITRAL] Keeping in view the above, Government had introduced the Information Technology [Amendment] Bill, 2006 in the Loka Saba on 15<sup>th</sup> December 2006.. Both Houses of Parliament passed the Bill on 23<sup>rd</sup> December 2008.Subsequently the Information Technology [Amendment] Act, 2008 received the assent of President on 5<sup>th</sup> February 2009 and was notified in the Gazette of India..

The Amendment provides for eight different types of offences, which range from using computer resource code or communication device to disseminating and composing information which is false, offensive or menacing in nature, fraudulent, dishonest use of electronic signatures, password or other identification features to any computer source or communication device in capturing, publishing or transmitting any form of obscene images and visuals, as being crimes affecting individuals or other persons. Cyber cafes have been brought in the net, increasing accountability of intermediaries, thereby including search engines, service providers, online markets, without clarity on how to trap the fox. These provisions structured in a diffused manner, with unrelated aspects such as cyber terrorism clauses juxtaposed in between.



GOOD LUCK

