

6. Internet & Emerging Technologies

History and Background:

- » The history of the Internet is closely tied to the U.S. Department of Defense.
- » In 1970's, Advanced Research Projects Agency (ARPA) developed a network that has evolved into today's Internet. The network was named as ARPANET.

ARPANET Objectives:

- » The network should continue to function even if one or many of the computers or connections in the network failed.
- » The network should be usable in different hardware and software platforms.
- » The network should be able to reroute its traffic around non-functioning parts of the network.
- » The network should be a network of networks rather than a network of computers.

Q.No.1. Define the following terms.

1. Internet: (M97, M99, RTP- 5M)

- a. It is very difficult to define the term 'Internet'. Internet is a network of computers that offer access to information and people.
- b. In some ways, it is like an information service, because it offers e-mail, bulletin boards, etc. through which one can access files and databases around the world.
- c. However, Internet is different from an information service because there is no central computer system. There is only a web of connections between thousands of independent systems connected to each other through telephone lines.
- d. The internet is not a single network. It is a vast, global network of networks. No single person, group or organisation runs the Internet. These networks communicate with each other on the basis of certain protocols such as TCP/IP. There are tens of thousands of such networks.
- e. Many to many, one to many, many to one as well as few to few types of networking is possible.
- f. Using telephone network, these computers can communicate with each other. These connections can use the regular dial up telephone lines or dedicated lines to connect to the nearest Internet Service Provider (ISP).
- g. A recent but revolutionary development on the Internet is World Wide Web (WWW).

2. WWW: (N06 - 4M)

- a. World Wide Web or Web is a component of the Internet that provides access to large amount of information located in different servers. WWW provides many of the services that are available on the Internet.
- b. The fundamental unit of the Web is the Web page. Web page is a document that contains links to other Web pages, graphics, audio files and other Internet services such as E-mail.
- c. Web pages reside in servers. These servers run special software that allows users to access web pages and other Internet services. Millions of Web servers are currently connected to the Internet. A user can directly access any Web page on one of these servers and then follow the links to other pages. This process creates a web of links around the world. That is why it is called WWW.
- d. Web pages are created by using Hypertext Markup Language (HTML).
- e. HTML allows the creator of a Web page to specify how text will be displayed and how to link to other web pages, files and Internet services.
- f. These links are formally known as hypertext links, because they are activated when a user clicks on specific text or image within a web page.

3. Web Browser (N03, N06, M07, N08 – 1M)

- a. To view a web page, the user must use special client software known as Web browser.
- b. The first browser capable of displaying graphics within a web page was Mosaic.
- c. Some of the popular web pages are Netscape Navigator, Internet Explorer, Fire fox, Opera, etc.

How web browser displays a web page?

- » Web browser reads a specified web page using HTML commands written in the web page and displays the information.
- » Text positioning, fonts, colors and size are specified through HTML.
- » The browser software interprets (=understand) the HTML commands and displays the information on the user's monitor.
- » It is important to note that different browsers can interpret an HTML command differently and display text differently.
- » For example a web page may contain HTML code stating that text should be emphasized. One browser may emphasize (=highlighting) text by bolding the text and another browser may use Italics.

4. Search Engine:

- a. Internet is a set of computer networks made up of number of smaller networks, using different networking protocols. There is no centralized management who is maintaining internet. Instead, it is a collection of thousands of individual networks and organisations, each of which is run independently.
- b. There is so much of information on the Internet. But such data is very poorly organised. Thus, it is almost impossible to find the required information or documents.
- c. One of the popular solutions to such problem is to use search engines. They are also called search tools or web crawlers or spiders.
- d. Search engines contain massive database of various web sites.
- e. They do not provide the entire information. But one has to search through them by typing the keywords that describe the required information.
- f. Some popular search engines:
 - » Google (<http://www.google.com>)
 - » Hot Bot (<http://hotbot.com/>)
 - » Yahoo (<http://www.yahoo.com/>)
 - » Altavista (<http://www.altavista.com>)
 - » All for One (<http://www.all4one.com>)

5. URL: (M03, M07, M08, RTP – 1M)

- a. World Wide Web or Web is a component of Internet that provides access to large amount of information located in different servers.
- b. Information is stored in servers in the form of web pages. Each web page and server must have a unique address so that computer can locate and retrieve the required information.
- c. The unique identifier for a host computer is called IP address and the unique identifier for a web page is called URL or Uniform Resource Locator. URL is similar to that of postal address.
- d. A typical URL looks like this: [Http:// WWW.ICAI.ORG/students/results.html](http://WWW.ICAI.ORG/students/results.html)
- e. The meaning of this URL is "Go to the host computer called ICAI, in a directory called Students and retrieve a hypertext document with the file name Results.Html."
 - » The first part of URL indicates the transfer protocol being used to retrieve specific document.
 - » The second part indicates the host computer on which the document resides. This part of the address is also called domain name.
 - » The third part of the URL indicates the directory on the host computer that consists of specific web site or multiple web sites. Similarly several other subdirectories can also be indicated.
 - » The last par of the URL indicates the specific web page requested by the user.

6. Web casting or Push Technology: (M04 – 5M, N06 – 4M, N07 – 1M)

- a. Generally Internet runs in pull environment where a user opens a browser application and searches for information.
- b. There are millions of web pages. So the user should find the required web page and "pull" the required information.
- c. The web pages are dormant (=lying behind) until they are located and opened by the user. But this process is frustrating and time consuming.

- d. Another web - based technology is push technology or web casting. It is different from traditional uses of Internet and it eliminates this frustration.
- e. This technology allows users to receive broadcast information rather than search the web for information.
- f. The user has to choose from a menu of sources, specifying what kind of information they want to receive. Once selected, the information is automatically forwarded to the user.
- g. For example, Internet news services deliver the day's activities to the user's desktop.
- h. Cost of push technology is also cheap because news is delivered along with advertisements.

Q.No.2. What are the uses or benefits of Internet? (Or) Explain chief uses of internet? (N04, N08–5M)

- a. **As a network:** Organisations can use the Internet to link their offices and employees. Thus Internet can be used as a virtual private network.
- b. **E-mail:** It is an electronic mail system in Internet. Each user will be given a unique address. With this user can communicate with any person in the world. There are different web sites providing this service such as Hotmail.com, Rocketmail.com, P.O.box.com., e-mail.com, yahoo.com, Rediffmail.com, gmail.com, etc.
- c. **Knowledge base:** Internet is a library where companies and establishments provide information about their products and services.
- d. **Chat rooms:** Using Internet Chat SW, user can log on to certain website and communicate with other users. This is an interactive software that allows users to type comment in one window and receive reply in another. Such websites are called Chat rooms.
- e. **Universities on the web:** Various universities have their own websites where they provide information about university, research, papers published by students and professors, etc. They also provide the facility of video conferencing.
- f. **E-Commerce:** E-Commerce refers to the use of internet for business-to-business and business-to-consumer transactions. It is the process of doing business electronically. Visitor to the site can sell or buy any product or service on line.
- g. **Data Publishing:** Data publishing is a new opportunity being provided by Internet. Information can be either forwarded to a specified address or stored in a particular place.

Q.No.3. Explain different applications of internet? (N04 – 5M)

Internet's applications are many and depend on the innovation of the user. The common applications of the Internet can be classified into three primary types namely: Communication, Data retrieval and Data publishing.

Communication:

- » Communication on the Internet can be online or offline.
- » When some users connect to a single server at the same time, they can communicate in an "online chat". This can be truly "many to many" communication.
- » Alternatively, users can send e-mail to each other which can be read by the receiver whenever he/she finds the time. This is off-line communication.
- » Users can come together electronically with the help of "usenet" groups. Users can post messages to be read and answered by others at their convenience.

Data Retrieval:

- » A large number of databases exist on the Internet.
- » These databases have been compiled from various sources and put together in a usable form.
- » This job can be done by commercially run data providers as well as individuals or groups with special interest in particular areas.
- » To retrieve such data, it is sufficient for any user to search several Internet servers.
- » This is similar to a search process in a large library.
- » Search engines help the users for searching the requisite information.
- » Latest information on products, markets, strategies, etc. can be found in a convenient way.

Data publishing:

- » Data publishing is a new opportunity available on Internet.
- » Latest information can be published in a special site or can be posted in a Usenet site or can be forwarded to specific addresses. Of course, Internet discourages sending of unsolicited E-mails.

Q.No.4. State some of the intrinsic benefits of using Internet for business? (RTP)

Today, Internet is the most advanced and sophisticated means of communication available to mankind. Till now Internet is being used for research and education purposes. But it can also be used for business purposes. Following are some of intrinsic benefits of using internet for business:

- » Information on businesses and services is arranged in a proper manner at a common location and is open to any person.
- » Access to this information is provided at reasonable costs.
- » Immediate feedback can be obtained from consumers or business partners,
- » The cost of information delivery to internal and external sources is reduced,
- » Employee can easily access required information even from distant locations,
- » Latest and updated information can be provided to customers and internal staff in an efficient manner.
- » Customized information can be delivered to consumers.

These are only a small sample of number of intrinsic benefits of using internet for business purposes.

Q.No.5. Write about E-mail? (N95 – 2M), (M97, M99 – 5M) What are the advantages of E-mail?

E-Mail: It is an increasingly utilized technology, which has become the primary means of communication for many organizations and individuals. Electronic mail provides quick, cost-effective transfer of messages to other E-mail users, worldwide. This is probably one of the fastest and most convenient ways of communication. At present, all Internet subscribers get free E-mail facility. In addition there are many private E-mail service providers.

Advantages:

- » With each E-mail address, the subscriber gets certain amount of disk space on the Server. This disk space serves as the post box of respective subscriber.
- » E-mail can be received even if the receiver's computer is switched off.
- » Lot of time, energy and money can be saved by creating a Mailing List of all clients and using it to send common letters/notices/circulars.
- » By creating Address book in the computer, one need not remember E-mail addresses.
- » The chance of delivering the message to a wrong person is very less.
- » The message is instantly transferred to the receiver.
- » One can also send files as attachments with E-mail messages.

Q.No.6. Explain various features offered by an E-mail software? (N03, N05 – 5M)

E-mail software supplied with Internet connection consists of some important and useful features, which are stated below:

- a. **Composing messages:** With this one can compose messages in an attractive way, using various fonts. It is also possible to spell check the message.
- b. **Replying to the mail received:** It is possible to reply to any mail by using the "Reply" facility available. This facility can save lost of time in remembering addresses.
- c. **Address Book:** This is an electronic form of Address Book where the following details can be saved: Name, full name, e-mail address, name of the organisation to which the person belongs, the designation of such person, etc.

- d. **Printing of messages:** It is possible to print messages received as well as sent.
- e. **Offline Editing / Composing / Reading:** To read/edit/compose messages it is not necessary to connect to Internet.
- f. **Forwarding of messages:** It is possible to forward any message received from, say, Mr. A to Mr.B without retyping the message.
- g. **Transfer of data files:** An important use of E-mail is the ability to send / receive data files to/from a client. This would result in considerable saving of time, energy and money.
- h. **Greeting cards:** On the Internet, there are several sites which offer free greeting cards for thousands of occasions.

Q.No.7. Write about Intranets? What are its features, objectives and benefits? (N00 – 5M)

Meaning: (N00 – 1M)

- » Intranet is a type of information system that facilitates communication within the organisation, among widely dispersed departments, divisions and regional locations.
- » It may consist of many inter-linked LANs and also use leased lines in the wide area networks.
- » Intranet includes connection through one or more gateway computers to the outside internet.
- » On Internet, the users can send e-mail, post documents, update material & chat with other users.
- » The main purpose of intranet is to share company information and computing resources among employees.
- » Intranet can also be used to facilitate working groups, video conferencing and continuous updating of company database.
- » The big difference is that an intranet is faster and more secure than internet.
- » Intranet uses TCP/IP, HTTP and other internet protocols and in general looks like a private version of internet.
- » However intranet uses passwords, restricting access to certain areas of the network.
- » Intranets is the main means of intra-office communication.

Advantages:

- » Reduced costs - printing, paper, software distribution, mailing, order processing, telephone
- » Reduced information searching time
- » Easier, faster access to information
- » Easier, faster access to remote locations
- » Sharing and reuse of tools and information – Reduced set – up and update time
- » Latest, up-to-date information,
- » Easier access to customers and partners
- » Collaborative, group working is possible.
- » Reduced support costs
- » Reduced redundant page creation and maintenance – Faster & cheaper creation

Features:

1. **Similar to Internet:** Intranet uses TCP / IP, Hypertext Transfer Protocol, and other Internet protocols and it looks like a private version of the Internet.
2. **Use of Public Network:** Companies can send private message through public networks, using special encryption / decryption and other security safeguards.
3. **User Access Control:** Intranet usually has a system of access privileges controlled by passwords, restricting access to certain areas of the network. For example, access to the files such as payroll, sales projections, product development notes and client memos can be restricted to a limited number of people.
4. **Access to Information:** With Intranet, access to all information, applications and data can be made available through the same browser.

Q.No.8. Define the term Intranet. State some areas where intranets are being used? (or) Applications of Intranet? (N07 – 5M)

Following are some of the areas where intranet is successfully used:

- Helps in Intra office communication:** A company's Intranet is the main means of intra-office communication. Updates to business policies and procedures, information on health insurance & other benefits, profiles of various employees, company's organisational structure can be published
- Electronic directory:** Intranets can provide electronic directory service, so that employees can easily find someone's telephone number and location.
- Electronic chatting:** Intranet can also provide the facility of white board, an electronic chat space, where employees can "talk" to each other by posting text messages.
- Employees can have own web pages:** Some employees can have their own home pages on their company's Intranet. Personal web pages allow employees to know each other.
- Helps in group decision making:** Intranet helps group decision making through Group Ware i.e. software used in group Decision Support System.
- Universities and Colleges:** Many universities and colleges have their own Intranets for students, faculty and other users.

Q.No.9. Write about Extranet? (M03, N05 – 5M, RTP)

Definition:

- Extranet is a private network that uses Internet protocol and public telecommunication systems to securely share part of a business's information or operations with suppliers, vendors, partners, customers or other businesses.
- It is part of company's intranet that is extended to users outside the company.
- Simply put, it is the Company's website for its customers and vendors.

Requirements: It requires security and privacy which can be provided through

- Firewall server management;
- Issuance and use of digital signature certificate or similar means of user authentication;
- Encryption of messages;
- Use of virtual private networks that pass through the public network.

Uses/Applications: Companies can use Extranet to:

- Exchange large volumes of data using EDI.
- Share product catalogues exclusively with wholesaler or those "in the trade".
- Collaborate with other companies on joint development efforts.
- Jointly develop and use training programs with other companies.
- One company can provide access to a group of other companies, such as an online banking application managed by one company on behalf of affiliated banks.
- Share news of common interest exclusively with partner companies.

Q.No.10. Write about Internet protocol suite.

- It is a set of communication protocols that implement the protocol stack on which the Internet and most commercial networks run.
- Sometimes it is called TCP/IP protocol suite.
- The two most important protocols in it are:
 - ▶ Transmission Control Protocol (TCP) and
 - ▶ Internet Protocol (IP)
- Like any other protocol suite internet protocol suite consists of a set of layers.
- Each layer solves a set of problems involving the transmission of data.
- It provides a well defined service to the upper layer protocols based on services from lower layers.
- Upper layers are logically closer to the user and deal with more abstract data.
- The OSI model describes a fixed, 7 layer stack for networking protocols. But TCP/IP consists of only 4 layers.

Q.No.11. Write a short notes on E-Commerce? (N02 – 5M, RTP)**Introduction:**

- » Electronic commerce and its related technologies are the current leading - edge business and finance delivery systems for the 21st century.
- » It is the process of doing business electronically. It involves automation of a variety of business-to-business and business-to-customer transactions through reliable and secure connections.
- » It strengthens relationships with buyers, makes it easier to attract new customers, improves customer responsiveness and opens new markets on a global scale.
- » EC is the application of various communication technologies to provide automatic exchange of business information with internal and external customers, suppliers and financial institutions.
- » It helps to cut costs while improving the quality of goods & services and increase the speed of service.
- » EC is associated with buying and selling of information, products & services via computer networks.

Definition: It is not possible to give all inclusive definition for E-Commerce. Following are some of the important definitions of E-Commerce:

- » Electronic Commerce is a composite of technologies, processes and business strategies that foster the instant exchange of information within and between organizations.
- » Electronic Commerce is the application of various communication technologies to provide the automatic exchange of business information with internal and external customers, suppliers and financial institutions. Examples of these technologies are Electronic Data Interchange (EDI), bar coding, scanning, E-mail, fax, etc.
- » Electronic Commerce, simply put, is the automation of the business process between buyers and sellers. - IBM Corporation.
- » Electronic business transactions, without paper documents, using computer and telecommunication networks.

Thus, it is clear that there is no single, globally accepted definition of EC. These technologies and services can include - Electronic Data Interchange (EDI), E-mail, Electronic Funds Transfer (EFT), Bulletin Boards (BBs), WWW, Electronic Banking (EB), Push technologies, Internet Telephony, Bar-coding, 2D - Imaging, Electronic Forms, Voice Recognition, security services such as firewalls, encryption, gateway managers and many more.

Q.No.12. State the impact of E-Commerce on business activities?

E- Commerce is the process of doing business electronically. It involves automation of a variety of business-to-business and business-to-consumer transactions through reliable and secure connections. E-Commerce shows impact on large number of business activities such as:

- » Marketing, sales and sales promotion,
- » Financing and insurance,
- » Commercial transactions: ordering, delivery, payment.
- » Product service and maintenance,
- » Distributed co-operative working,
- » Business administration, (permissions, tax, customs, etc)
- » Transport and logistics,
- » Public procurement,
- » Automatic trading of digital goods,
- » Accounting.

Q.No.13. What are the benefits of E-Commerce application implementation? (N02,N06,M08–5M, RTP)

E-Commerce is the process of doing business electronically. It involves automation of a variety of business-to-business and business-to-consumer transactions through reliable and secure connections. EC presents many benefits to individual organizations, consumers and society as a whole. They are:

- » Buyers can get the required goods at less cost because more suppliers will compete in an electronically open market.
- » It is not necessary to re-enter data. Thus information processing errors, time and overhead costs can be reduced.

- » Sellers can participate in on-line bidding. Thus selling costs can be reduced.
- » Reduced time to complete business transactions, from delivery to payment.
- » Creation of new markets as it is easy and cheap to reach potential customers.
- » Easy entry into new markets, especially geographically remote markets, for companies of all sizes and locations.
- » Better quality and improved variety of goods can be acquired by consumers because of increase in competition and expanded markets.
- » Reduced inventories and reduction of risk of obsolete inventories because the demand for goods and services is electronically linked through just-in-time inventory and integrated manufacturing techniques.
- » Reduced overhead costs through uniformity, automation and large scale integration of management processes.
- » Reduced delivery cost, especially for goods that can also be delivered electronically.
- » Equal access to markets (i.e. for small-to-medium enterprises and big corporations).
- » Reduced use of ecologically damaging materials.
- » Ability to undertake more global programs.
- » Reduced advertising costs.
- » Equal access to new markets.
- » Easy access to new markets.

Q.No.14. State some reasons for increasing impact of Internet on E- Commerce? (N08-5M)

E-Commerce is the process of doing business electronically. It involves automation of a variety of business-to-business and business-to-consumer transactions through reliable and secure connections. Internet has shown dramatic impact on E-Commerce. Following are some reasons for such dramatic impact of internet on E-Commerce:

- a. **Universality:** Using internet any business can easily interact with any other business. This was not possible in earlier networking technologies. In those technologies, businesses can interact with only those computers that are connected to the same network.
- b. **Reach:** Internet is every where - large cities, small towns and through out the modern and developing world.
- c. **Performance:** Unlike many other public networks, Internet can handle visual images, audio, and other large electronic objects. It provides different kinds of functions, in addition to handling everyday networking tasks such as electronic mail.
- d. **Reliability:** The design concepts for the Internet came out of U.S. Department of Defense. Hence, Internet technology is highly robust and reliable.
- e. **Cost:** Compared to alternative networking technologies, Internet costs are surprisingly low.
- f. **Readymade:** Tens of millions of individuals are already connected to the Internet and business can readily use it.

Because of the above reasons internet is showing dramatic impact on E-Commerce.

Q.No.15. Write about different types of E-Commerce (or) Different classes of E-Commerce?

E-Commerce can be used in the following 3 distinct areas.

- » Customer-to-Business
- » Intra-organisational (within a business)
- » Inter-organisational (business-to-business)

Q.No.16. Define the term B2B with reference to E-Commerce. (Or) State the Role of E-Commerce in Inter organisation applications?

Meaning:

- » B2B is a short form of business-to-business exchange of services, information and/or products from one business to another business.
- » B2B electronic commerce (B2B) typically takes the form of automated processes between trading partners and is performed in much higher volumes than B2C applications.

- » For example, a company that manufactures tyres can sell them to an automobile manufacturer rather than directly to the consumers. This is a B to B transaction.
- » EDI and Intranet are good examples of inter-organisation information systems.

B2B applications: Inter-organisation e-commerce applications include:

- a. **Supplier management:** EC applications help companies to negotiate and transact with suppliers at reduced costs. This helps to reduce purchase order processing costs and cycle times and increase the number of orders processed during a period of time.
- b. **Inventory management:** Electronic applications shorten the order-ship-bill cycle. If majority of business partners are electronically linked, information once sent by fax or mail can now be instantly transmitted. Business can also track their documents. This also helps to reduce inventory levels, improve inventory turnover and eliminate out-of-stock occurrences.
- c. **Distribution management:** Electronic applications facilitate the transmission of documents such as bill of lading, purchase orders and ensures that documents contain more accurate data.
- d. **Channel partners management:** EC applications quickly distribute information about changing operational conditions to trading partners.

B2B standards:

- » UN/EDIFACT is one of the most well-known and established B2B standards.
- » ANSI ASC X.12 is also a popular standard in the States.
- » Rosetta Net is an XML based, emerging B2B standard in the heavy technology industry.

Q.No.17. Define the term Wallet. (RTP)

Definition:

1. Wallet is an encryption software which holds user's payment information, a digital certificate to identify the user, and shipping information to speed transactions.
2. Wallet is a software program and data that is used for on-line purchase transactions.
3. It allows several methods of payments (like use of different credit cards) that are defined within the wallet.
4. It generally resides on the user's Personal Computer.

Benefits:

1. **Consumer:** The consumer benefits because his or her information is encrypted against piracy and because some wallets will automatically input shipping information at the merchant's site and will give the consumer the option of paying by digital cash or check.
2. **Seller / Merchants:** Merchants benefit by receiving protection against fraud.

Operation:

1. When the user (or the consumer) orders for purchase of something, the order is sent to the vendor's server.
2. The vendor's server sends back an invoice requesting the consumer to launch the wallet in his computer.
3. The user then selects "pay" option in the cyber cash software of vendor's server which sends a message back to the consumers PC that activates the "wallet" software.
4. The consumer selects one of the cards defined in the wallet and clicks.
5. The transaction includes real-time credit card authorization.

Q.No.18. What do you mean by B2C in E-Commerce? (Or) Write about E-Commerce applications in the area of B2C.

Meaning:

- » B2C is a short form of business-to-consumer and involves exchange of services, information and/or products from a business to a consumer, as opposed to between one business and another.
- » It is a form of electronic commerce in which products or services are sold from a firm directly to the consumer.

Classification of B2C E-Commerce:

1. **Direct Sellers:** Companies that provide products or services directly to customers are called direct sellers. Following are the 2 types of direct sellers.
 - a. **E-tailers:** On the basis of order received, the E-tailer ships products directly to the consumer or to a wholesaler or manufacturer for delivery.
 - b. **Manufacturers:** A manufacturer can sell directly to consumers via Internet. The target is to remove intermediaries, through a process called dis-intermediation and to establish a direct relationship with customers. This is not a new idea because several companies have been utilizing this method for years.
2. **Online Intermediaries:** Online intermediaries are companies that facilitate transactions between buyers and sellers and receive some percentage. Following are the 2 types of online intermediaries.
 - a. **Brokers:** A broker is a company that facilitates transactions between buyers and sellers. There are various types of Brokers:
 - i) **Buy/Sell Fulfillment:** A corporation that helps consumers place buy and sell orders.
 - ii) **Virtual Mall:** A company that helps consumers to buy from a variety of stores.
 - iii) **Metamediary:** A firm that offers customers access to a variety of stores and provides them with transaction services, such as financial services.
 - iv) **Bounty:** An intermediary that offers a fee to locate a person, place, or idea.
 - v) **Search Agent:** A company that helps consumers to compare different stores.
 - vi) **Shopping Facilitator:** A company that helps consumers in using online shops easier by providing facilities such as currency conversion, language translation, payment and delivery solutions, etc.
 - b. **Infomediaries:**
 - i) **Advertising based models:**
 - » In this system, businesses' sites have ad inventory, which they sell to interested parties.
 - » Advertisers take a high-traffic approach when attempting to reach a larger audience. These advertisers will be willing to pay a premium for a site that can deliver high numbers, for example advertisements on any web site.
 - » When advertisers are trying to reach a smaller group of buyers, they take a niche approach. These buyers are well-defined, clearly identified, and desirable. This approach focuses on quality, not quantity. For example, customised advertisements in some websites, targeting a particular class of people.
 - ii) **Community based models:** In a community based system, companies allow users worldwide to interact with each other on the basis of similar areas of interest. These firms make money by accumulating loyal users and targeting them with advertising.
 - iii) **Fee-Based Models:** In a fee-based system, a firm charges a subscription fee to view its content.

Advantages of B2C:

- » The B2C model can save time and money by doing business electronically.
- » This minimizes internal costs created by inefficient and ineffective supply chains and creates reduced end prices for customers.
- » Shopping can be faster and more convenient.
- » Offerings and prices can change instantaneously.
- » Call centers can be integrated with the website.
- » Broadband telecommunications will enhance buying experience.

Payment Options for B2C E-commerce businesses: Following are different types of online payment options that could be used in B2C E-commerce.

- a. **Financial cyber intermediary:** An internet based company that facilitates payment between two individuals, online, usually by credit card.
- b. **Electronic Cheque:** Transferring money from one's checking account to another over the internet.
- c. **Electronic Bill Presentment And Payment (EBPP):** A Computer system that generates electronic bills and sends them to customers over the internet.
- d. **Smart Card:** Debit cards that contain information about how much money you have and deduct purchases from that total. These are provided by all banks.

Merchandise that is best suited for B2C: B2C can be used for all products in online. Following are the types of merchandise that can be easily sold online by a B2C E-commerce business:

- a. **Convenience Goods:** Low priced products which are bought frequently.
- b. **Specialty Goods:** High priced merchandise that is ordered rarely and usually requires customization.
- c. **Commodity-like Goods:** Products that are same where ever they are bought and are highly substituted.
- d. **Digital Goods:** Products that can be created and sent electronically. For example, music, images, videos, etc.

Challenges Faced by B2C E-Commerce:

- a. The two main challenges faced by B2C e-commerce are:
 - ▶ building traffic and
 - ▶ sustaining customer loyalty.
- b. Due to 'winner-take-all' nature of B2C structure, many smaller firms find it difficult to enter a market and remain competitive.
- c. In addition, online shoppers are very price-sensitive and are easily lured away. So, it is very difficult to acquire and keep new customers.

Q.No.19. Define the term CRM? Write short notes on implementation of CRM?

Meaning:

- » Customer Relationship Management (CRM) includes the methodologies, technology and capabilities that help an enterprise to manage customer relationships.
- » The general purpose of CRM is to help organizations in managing their customers in a better way through the introduction of reliable systems, processes and procedures.

Implementation of CRM:

- a. CRM is a corporate level strategy which focuses on creating and maintaining long lasting relationships with its customers.
- b. CRM is not technology itself. It is a holistic change in the organization's philosophy which places emphasis on the customer.
- c. A successful CRM strategy can't be implemented by simply installing and integrating a software package and will not happen over night.
- d. Changes must occur at all levels including policies and procedures, front office customer service, employee training, marketing, systems and information management, etc.
- e. All the aspects of business must be reshaped to be customer driven.
- f. When setting up a CRM, the company has to first identify the key areas relevant to its business. They are:
 - » What information it needs to serve its consumers,
 - » Customer's past financial history,
 - » Effects of the CRM segment,
 - » What information is not useful,
- g. Eliminating unwanted information can be the large aspect of implementing CRM system.
- h. While designing a CRM structure, a company may keep more extensive information of their primary customers and less extensive details of their low-margin clients.

Requisites of a good CRM Program: To be effective, the CRM process needs to be integrated across marketing, sales and customer service. A good CRM program needs to:

- a. Identify customer success factors,
- b. Create a customer-based culture,
- c. Adopt customer-based measures,
- d. Develop an end-to-end process to serve customers,
- e. Recommend the questions to be asked to help a customer to solve a problem,
- f. Recommend what to tell a customer with some complaint,
- g. Track all aspects of selling to customers.

Architecture of CRM: There are 3 parts of application architecture of CRM

- a. **Operational:** automation is provided to the basic business processes like marketing, sales, service, etc.
- b. **Analytical:** helps to analyze customer behavior, implements business intelligence like technology, etc.
- c. **Collaborative:** ensures contact with customers like phone, email, fax, web, SMS, post, in person, etc.

Q.No.20. Write about Operational CRM.

Meaning:

- » Operational CRM means supporting the front office business processes, which include customer contact like sales, marketing and service,
- » Tasks resulting from these processes are forwarded to the employees responsible for them,
- » The necessary information for carrying out the tasks is also provided,
- » Information to back end applications is provided, and
- » activities with customers is documented for further reference.

Advantages: It provides the following benefits

- » Delivers personalized and efficient marketing, sales, and service,
- » Enables a reverse view of the customer while the organization is interacting with them.
- » Sales people and service engineers can access complete history of all customer interaction with the company.

Areas of business: The operational part of CRM typically involves 3 general areas of business

- a. **Sales Force Automation (SFA):** SFA automates some of the company's critical sales and sales force management functions. For example, lead/account management, contact management, quote management, forecasting, sales administration, keeping track of customer preferences, buying habits, and demographics, as well as performance management. SFA tools are designed to improve field sales productivity.
- b. **Customer Service and Support (CSS):** CSS automates some service requests, complaints, product returns and information requests. Traditional internal help desk and traditional inbound call-center support for customer enquiries are now developed as "Customer Interaction Center" (CIC) using multiple channels (Web, phone/fax, face-to-face, kiosk, etc).
- c. **Enterprise Marketing Automation (EMA):** EMA provides information about the business environment, including competitors, industry trends and macro environmental variables. It is the execution side of campaign lead management. The intention of EMA application is to improve marketing campaign efficiencies.

Many call centers use CRM software to store all of their customer's details. When a customer calls, the system can be used to retrieve and store information relevant to the customer. By serving the customer quickly and efficiently, and also keeping all information of a customer in one place, a company aims to make cost savings, and also encourage new customers.

Q.No.21. Write about Analytical CRM.

Meaning: In analytical CRM, data gathered within operational CRM and/or other sources are analyzed to segment customers or to identify potential customers to enhance client relationship. Examples of campaigns directed towards customers are:

- a. **Acquisition:** Cross-sell, up-sell
- b. **Retention:** Retaining customers who leave due to maturity or attrition.
- c. **Information:** Providing timely and regular information to customers.
- d. **Modification:** Altering details of transactional nature of the customers' relationship.

Coverage: Analysis is not limited to decision support. But it generally covers the following:

- a. Dashboards, reporting, metrics, performance etc.
- b. Predictive modeling of customer attributes.
- c. Strategy and research.

Analysis of customer data: Analysis of customer data may relate to one or more of the following areas:

- » Campaign management and analysis
- » Contact channel optimization
- » Contact Optimization
- » Customer Acquisition / Reactivation / Retention
- » Customer Segmentation
- » Customer Satisfaction Measurement / Increase
- » Sales Coverage Optimization
- » Fraud Detection and analysis
- » Financial Forecasts
- » Pricing Optimization
- » Product Development
- » Program Evaluation
- » Risk Assessment & Management

Data warehouse:

- » Data collection and analysis is viewed as a continuous process,
- » Generally business decisions are refined over a period of time, based on the feedback from earlier analysis and decisions,
- » Therefore, most successful analytical CRM projects take the advantage of a data warehouse to provide suitable data.

Q.No.22. Write about Collaborative CRM.

Meaning:

- » Collaborative CRM facilitates interactions with customers through all channels like personal, letter, fax, phone, web, E-mail and supports co-ordination of employee teams and channels.
- » It is a solution that brings people, processes and data together.
- » So, companies can better serve and retain their customers.
- » The data/activities can be structured, unstructured, conversational, and/or transactional in nature.

Objective: The objectives of collaborative CRM can be broad, including cost reduction and service improvements.

Benefits: Collaborative CRM provides the following benefits

- » Enables efficient productive customer interactions across all communication channels.
- » Enables web collaboration to reduce customer service costs.
- » Integrates call centers enabling multi-channel personal customer interaction.
- » Integrates view of the customer while interacting at the transaction level.

Q.No.23. In what way a CRM software can improve customer service?

A good CRM program will allow a business to acquire customers, service the customer, increase the value of the customer to the company, retain good customers, and determine which customers can be retained or given a higher level of service. A good CRM program can improve customer service by facilitating communication in several ways:

- a. **Product information:** It can provide product information, product use information and technical assistance on web sites that are accessible round the clock.
- b. **Quality:** Identify how each individual customer defines quality and then design a service strategy for each customer based on these individual requirements and expectations.

- c. **Sales follow up:** Provides a fast mechanism for managing and scheduling follow-up sales calls to assess post-purchase cognitive dissonance, repurchase probabilities, repurchase times and repurchase frequencies.
- d. **Tracking points of contact:** Provides a mechanism to track all points of contact between a customer and the company and do it in an integrated way.
- e. **Identify potential problems:** Helps to identify potential problems quickly, before they occur.
- f. **Registering complaints:** Provides a user-friendly mechanism for registering customer complaints. The complaints that are not registered with the company can't be resolved and are a major source of customer dissatisfaction.
- g. **Handling problems & complaints:** Provides a fast mechanism for handling problems and complaints (complaints that are resolved quickly can increase customer satisfaction)
- h. **Correcting service deficiencies:** Provides a fast mechanism for correcting service deficiencies. Helps to correct the problem before other customers experience the same dissatisfaction.
- i. **Track customer interests:** Uses internet cookies to track customer interests and personalize the product accordingly.
- j. **Scheduling maintenance:** Provide a fast mechanism for managing and scheduling maintenance, repair, and on-going support. This improves efficiency and effectiveness.
- k. **Integration:** The CRM can be integrated into other cross-functional systems and thereby provide accounting and production information to customers when they want it.

Technical functionality: A CRM solution is characterized by the following functionality:

- a. **Scalability:** the ability to be used on a large scale and can be reliably expanded to the necessary scale.
- b. **Multiple communication channels:** The ability to interface with users via several devices (phone, WAP, internet, etc.)
- c. **Workflow:** the ability to trigger a process in the back office system, e. g. Email Response, etc.
- d. **Assignment:** the ability to assign requests (Service Requests, Sales Opportunities) to a person or group.
- e. **Database:** the centralized storage (in a data warehouse) of all information relevant to customer interaction.
- f. **Customer privacy considerations:** the data encryption and the destruction of records to ensure that they are not stolen or abused.

Q.No.24. Define Supply Chain Management and Supply Chain Event Management?

Supply Chain Management:

- » Supply Chain Management (SCM) is the process of planning, implementing and controlling the operations of the supply chain with the purpose to satisfy customer requirements in an efficient way.
- » Supply chain management covers all movements and storage of raw materials, work-in-process, and finished goods from point-of-origin to point-of-consumption.
- » According to the Council of Supply Chain Management Professionals (CSCMP) Supply Chain Management encompasses the planning and management of all activities involved in sourcing procurement, conversion and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers.
- » In essence, Supply Chain Management integrates supply and demand management within and across companies.

Supply Chain Event Management (SCEM):

- » Supply Chain Event Management is a consideration of all possible occurring events and factors that can cause a disruption in a supply chain.
- » With SCEM, possible scenarios can be created and solutions can be planned.
- » Some experts distinguish supply chain management and logistics management, while others consider the terms to be interchangeable.

Q.No.25. Write down the opportunities that are enabled by Supply Chain Management?

Proper implementation of SCM helps to use the following strategic and competitive areas to their full advantage.

- a. **Fulfillment:** It ensures that right quantity of parts for production or products for sale arrive at the right time and it is achieved through efficient communication. It also allows a company to constantly monitor the inventory and ensure that the right quantities are ordered to replace stock.
- b. **Logistics:** Keeping the transportation cost of materials as low as possible along with safe and reliable delivery. Here the SCM enables a company to have constant contact with its distribution team, which could consist of trucks, trains, or any other mode of transportation.
- c. **Production:** SCM ensures smooth functioning of production lines because necessary spare parts and components will be available as and when necessary. As logistics are correctly implemented, production can run smoothly.
- d. **Revenue & profit:** When supply chain is properly managed companies can react to the unforeseen changes in demand and supply in a flexible way. Because of this, a company can produce goods at lower prices and distribute them in a quicker way, thus increasing the overall profit.
- e. **Costs:** Keeping the cost of purchased parts and products at acceptable levels. SCM reduces costs by increasing inventory turnover on the shop floor and in the warehouse, controlling the quality of goods and thus reducing internal and external failure costs.
- f. **Cooperation:** Co-operation among supply chain partners ensures 'mutual success'. Collaborative Planning, Forecasting and Replenishment (CPFR) is a longer-term commitment, joint work on quality and support by the suppliers. This relationship allows a company to have access to current, reliable information, obtain lower inventory levels, cut lead times, enhance product quality, improve forecasting accuracy and ultimately improve customer service and overall profits.

Q.No.26. What are the problems faced by Supply Chain Management? (N07 – 5M)

Supply chain management must address the following problems:

- a. **Distribution Network configuration:** Number and location of suppliers, production facilities, distribution centers, warehouses and customers.
- b. **Distribution Strategy:** Centralized versus decentralized, direct shipment, cross docking, pull or push strategies, third party logistics.
- c. **Information:** Integrated systems and processes through the supply chain to share valuable information, including demand signals, forecasts, inventory and transportation.
- d. **Inventory Management:** Quantity and location of inventory including raw materials, work-in-process and finished goods.

Q.No.27. State the activities or functions of SCM.

- a. SCM is a cross functional approach to manage the movement of raw materials into an organisation and movement of finished goods out of the organisation towards the end consumer.
- b. Due to outsourcing of several operations:
 - » the number of companies involved in satisfying consumer demand have increased,
 - » while reducing management control of daily logistics operations.
- c. Less control and more supply chain partners led to the creation of supply chain management concepts.
- d. Several models have been proposed for understanding the activities required to manage material movements across organizational and functional boundaries.
- e. SCOR is a supply chain management model proposed by the Supply-Chain Council.
- f. Another model is the SCM Model proposed by the Global Supply Chain Forum (GSCF).

Q.No.28. Write about different levels of activities involved in SCM (Or) What are the different ways in which supply chain activities can be grouped?

Supply chain activities can be grouped into strategic, tactical and operational levels of activities.

Strategic level:

- a. Strategic network optimization, including the number, location and size of warehouses, distribution centers and facilities.
- b. Strategic partnership with suppliers, distributors, and customers, creating communication channels for critical information & operational improvements such as cross docking, direct shipping and third-party logistics.
- c. Product design coordination, so that new and existing products can be optimally integrated into the supply chain.
- d. Information Technology infrastructure, to support supply chain operations.
- e. Where to make, what to make and make or buy decisions.

Tactical level:

- a. Sourcing contracts and other purchasing decisions.
- b. Production decisions, including contracting, locations, scheduling, and planning process definition.
- c. Inventory decisions, including quantity, location and quality of inventory.
- d. Transportation strategy including frequency, routes and contracting.
- e. Benchmarking of all operations against competitors and implementation of best practices throughout the enterprise.
- f. Milestone Payments.

Operational level:

- a. Daily production and distribution planning, including all nodes in the supply chain.
- b. Production scheduling for each manufacturing facility in the supply chain (minute by minute)
- c. Demand planning and forecasting, coordinating the demand forecast of all customers and sharing the forecast with all suppliers.
- d. Sourcing planning, including current inventory and forecast demand, in collaboration with all suppliers.
- e. Inbound operations, including transportation from suppliers and receiving inventory.
- f. Production operations, including the consumption of materials and flow of finished goods.
- g. Outbound operations, including all fulfillment activities and transportation to customers.
- h. Order promising, accounting for all constraints in the supply chain, including all suppliers, manufacturing facilities, distribution centers, and other customers.
- i. Performance tracking of all activities.

Q.No.29. Write about Bullwhip effect in SCM. (M08 – 5M)

Meaning: The Bullwhip Effect or Whiplash Effect is an observed phenomenon in forecast driven distribution channels.

Forecasting demand:

- a. Customer demand is very unstable. So, organisation must forecast demand in order to arrange for inventory and other resources.
- b. Forecasts are based on statistics, and they are rarely perfectly accurate. So, Companies generally maintain additional inventory called safety stock.

Safety stock:

- c. Moving up the supply chain from end consumer to raw materials supplier, each supply chain participant has greater observed variation in demand and thus greater is the need for safety stock.
- d. During the periods of rising demand, down-stream participants will increase their orders.
- e. During the periods of falling demand, orders will fall or stop in order to reduce inventory.
- f. Due to this the variations in demand are further amplified.

Forecast driven Vs. demand driven supply chain: Supply chain experts have recognized that the Bullwhip Effect is a problem in forecast driven supply chains.

- g. The alternative is to establish a demand driven supply chain which reacts to customer orders.
- h. The result is near-perfect visibility of customer demand and inventory movement throughout the supply chain.
- i. Better information leads to better inventory positioning and lower costs throughout the supply chain.
- j. Barriers to implement a demand driven supply chain include - investments in information technology and creating a corporate culture of flexibility and focus on customer demand.

Factors contributing to the Bullwhip Effect:

- » Forecast Errors
- » Lead Time Variability
- » Batch Ordering
- » Price Fluctuations
- » Product Promotions
- » Inflated Orders
- » Methods intended to reduce uncertainty, variability, and lead time:
- » Vendor Managed Inventory (VMI)
- » Just In Time replenishment (JIT)
- » Strategic partnership (SP)

Q.No.30. Define the term EDI? (N97–5M) What are the advantages of EDI (M95,M03,N03,M06,M07–5M)

Meaning:

- » In traditional paper-based flow of information, data is entered manually. In addition, manual reconciliation, comparison of purchase order, receiving notice and invoice is also required. Therefore cost of transaction processing will be high. These two manual processes are eliminated in EDI.
- » EDI is computer-to-computer communication using a standard data format to exchange business information electronically between independent organisations.
- » The data transfer can be direct, between two companies using an agreed upon protocol, or it can be performed by a third party service vendor.
- » Users can transmit business documents such as purchase orders, price quotes, shipping notices and even payment orders electronically to customers and suppliers.
- » Companies that handle large volume of repetitive transactions can get significant benefits by converting to EDI.
- » Companies that face strong competition, companies operating in a time sensitive environment can also get benefits from EDI.
- » EDI improves the operations by providing electronic information exchange between trading partners.

Definition: The term EDI has many definitions. American National Standards Institute (ANS) has defined it as: *“Electronic Data Interchange is the transmission, in a standard syntax, of unambiguous information of business or strategic significance between computers of independent organisations. The users of EDI do not have to change their internal database. However, users must translate this information to or from their own computer system formats, but this translation software has to be prepared only one”*

Advantages of EDI: (N08-5M)

- » Issue and receive orders faster,
- » Make sales more easily,
- » Get paid Sooner,
- » Minimise capital tied up in inventory,
- » Reduced letters and memos,
- » Easy to update catalogues and part listings,
- » Best suited for a selective group of trading partners.

Q.No.31. Define the term EDI? Briefly explain how EDI works? (M05, N07 – 5M)

EDI is the electronic exchange of business documents such as invoices, purchase orders and shipping notices in a standard, machine-processable data format. EDI automates the transfer of data between dissimilar computer systems. This is a 3-step process.

- » Data from sending computer's application is translated into standard format.
- » Then, it is transmitted over communication lines to your trading partner.
- » Finally, it is re-translated by your trading partner's application program.
- » If the trading partner wants to send data, the process is reversed

Requirements: To make EDI work, one needs communications software, translation software and access to standards.

- a. **Communications software:** It moves data from one point to another, flags the start and end of an EDI transmission and determines how acknowledgements are transmitted and reconciled.
- b. **Translation software:** It helps the user to build a map and shows him how the data fields from his application corresponds to the elements of an EDI standard.
- c. **Uses of map:** Later, it uses this map to convert data back and forth between the application format and the EDI format.

Q.No.32. Explain the problems that are addressed by EDI in relation to paper based information system?

1. **Labour costs:** In a paper based system, manual processing is required for data keying, document storage and retrieval, document matching, envelope stuffing, etc.
2. **Errors:** Since the same information is keyed in for number of times, paper based systems are error-prone.
3. **Inventory:** Delays and uncertainties are common in paper processing. So, inventory may be higher than they need to be.
4. **Uncertainty:** Uncertainty exists in the following three areas –

Areas	Reason
1. Timing	Transportation and keying delays.
2. Communication	Sender does not know whether the matter dispatched was received at all.
3. Payment	Difficult to tell when the bank will disburse the cheque.

Q.No.33. Define the Electronic Funds Transfer. State some examples of EFT systems in operation?**Electronic Funds Transfer (EFT): (RTP)**

- » EFT stands for "Electronic Funds Transfer".
- » It represents the ways the business can receive direct deposit of all payments from financial institutions to the company's bank account.
- » Once the user signs up, money comes to him directly and sooner than ever before.
- » EFT is fast and safe. It means the money will come to the user's bank account quicker than if he had to wait for the mail, deposit the cheque and wait for the funds to become available.
- » The payment mechanism moves money between accounts in a fast, paperless way.
- » Some common examples of EFT are Automatic Teller Machine, Point-of-Sale Transactions, Preauthorised Transfers and Telephone Transfers.

Automatic Teller Machines (ATMs):

- » ATMs are specialised form of Point of Sale Terminals that are designed for unattended use by a customer of a financial institution.
- » These ATMs are kept in a public place and are connected to the network of financial institution.
- » With the help of these machines consumers can do their banking without the assistance of a teller.

- » These machines are activated by inserting a card (ATM/Debit/Credit) which contains user's account number and PIN on a magnetic strip.
- » The card holder has to enter the PIN into the ATM which is transmitted to the server in an encrypted form.
- » The ATM calls up the server, verifies the customer's account balance, dispenses the cash and generates a transaction slip.
- » Even bank personnel will not be able to see the customer's PIN number as it is stored in encrypted form.
- » ATM cards can be used to get cash, or to make deposits, pay bills, or transfer funds from one account to another account electronically.

Point-of-Sale (POS) Transactions:

- » Some Debit or EFT cards (sometimes referred to as check cards) can be used for shopping that allow the transfer of funds from the consumer's account to the merchant's account.
- » To pay for a purchase, the consumer presents an EFT card instead of check or cash.
- » Money is taken out of the consumer's account and put into the merchant's account electronically.

Preauthorized Transfers:

- » This is a method of automatically depositing to or withdrawing funds from an individual's account, when the account holder authorizes the bank or a third party (such as employer) to do so.
- » For example, consumers can authorize direct electronic deposit of wages, social security, or dividend payments to their accounts.
- » They can also authorise financial institutions to make regular, ongoing payments of insurance, mortgage, utility or other bills.

Telephone Transfers:

- » Consumers can transfer funds from one account to another, for example from savings to current account, or
- » They can order payment of specific bills by phone.

Q.No.34. Write about credit card? What are the steps involved in credit card transaction?

Credit Card:

- » It is a system of payment in which a small plastic card is issued to the users of the system.
- » Those persons who are interested to obtain a credit card must apply to some bank or financial institution.
- » A credit card will be issued after verifying the credit worthiness of the applicant.
- » A credit limit is sanctioned to each applicant and the applicant can make purchases or draw funds within such credit limit.
- » For this service the bank or financial institution collects some service charge.

Manual Credit Card transaction:

- » In a credit card transaction, the consumer presents preliminary proof of his ability to pay by presenting his credit card number to the merchant.
- » The merchant verifies this with the bank and creates a purchase slip which is endorsed by the consumer.
- » The merchant then uses this purchase slip to collect funds from the bank, and
- » On the next billing cycle, the consumer receives a statement from the bank with a record of the transaction.

Credit card transaction through internet:

- a. The same procedure is followed to make purchases over the internet.
- b. But on the Internet, additional steps must be taken to provide more security to the transactions and for authentication of both buyer and seller.
- c. Variety of systems are developed for using credit cards over the Internet.
- d. 2 main distinguishing features of these systems are:
 - » the level of security they provide for transactions, and
 - » the software required on both the customer and business sides of the transaction.
- e. Credit cards can be handled on line in two different ways:
 - » Sending unencrypted credit card numbers over the Internet,
 - » Encrypting credit card details before any transaction is transmitted.

Unencrypted credit card information:

- » A customer browsing the web might enter a credit card number in an order form and click a submit button to transmit the information to the merchant's web server.
- » Since the data is raw, anyone can intercept the transmission. So, there is no security for this type of transaction.
- » On the other hand an unscrupulous merchant (or someone posing as a merchant) can use such unencrypted numbers for illegal charges.

Encrypting credit card details:

- » Encrypting credit card transactions can also be subdivided according to what is encrypted.
- » If the entire transmission between buyer and merchant is encrypted, the merchant has to decrypt at least the order details to complete the purchase.
- » But sensitive information like credit card numbers will be visible to merchant and he/his employees may misuse such information.
- » To protect against this, a trusted third party can be used to separately handle credit card and order data with a wallet as helper application.
- » Such third party decrypts the credit card information for authorisation of the purchase.

Q.No.35. Explain the emerging trends for simpler interoperability of electronic wallet and credit card transactions?

Transaction Using Third Party Verification:

- » The market for handling credit card purchases on the Internet is yet to develop as a single way of doing things, or a single standard that allows the software from different vendors to work together.
- » Due to lack of interoperability it is likely to slow down both consumer and business acceptance of using credit cards for making purchases on the Internet.
- » However, there are 2 significant standards that will make the interoperability of electronic wallet and credit card transactions simpler, both for consumers and businesses.

Secured Electronic Transaction (SET):

- » Secured Electronic Transaction Protocol (SET) was first developed by a consortium led by MasterCard & Visa.
- » It is a combination of protocols designed for use by other applications (such as Web browsers) and a standard for handling credit card transactions over the Internet.
- » It is designed for cardholders, merchants, banks and other card processors.
- » SET uses digital certificates to identify all parties involved in a purchase.
- » SET also encrypts credit card and purchase information before transmission on the Internet.

Joint Electronic Transaction:

- » The second standard is Joint Electronic Payments, led by World Wide Web Consortium and Commerce Net.
- » JEPI is an attempt to standardize payment negotiations.
- » On the buyer's side, it serves as an interface that enables a Web browser and wallets to use a variety of payment protocols.
- » On the merchant's side, it acts between the network and transport layers to pass off the incoming transactions to the proper transport protocol (for e.g. e-mail vs. HTTP) and proper payment protocol (such as SET)
- » Multiple protocols will be around for payment, transport and wallets.
- » JEPI makes it easier for the buyer to use a single application and a single interface, in a variety of commercial situations.

Q.No.36. Write about electronic cheques (or) Explain the systems developed to pay web merchants directly?

Electronic Cheques:

- » An electronic cheque has all the features as a paper cheque.
- » It acts as a message to the sender's bank to transfer funds.
- » Like a paper cheque, the message is first given to the receiver who, in turn, endorses the cheque and presents it to the bank to obtain funds.
- » The electronic cheque can prove to be superior to the paper cheque in one significant aspect. The sender can protect himself against fraud by encoding the account number with the bank's public key. Thus it is not necessary to reveal the account number to the merchant.
- » Similar to SET protocol, digital certificates can be used to authenticate the payer, the payer's bank, and the bank account.

Credit card payments will undoubtedly be popular for commerce on the Internet. However, following 2 systems have been developed to use electronic cheques to pay Web merchants directly.

1. FSTC:

- » The FSTC is a consortium of banks and clearing houses that has designed an electronic cheque.
- » Designed in the lines of traditional paper cheque, this new cheque is initiated electronically.
- » It uses digital signature for signing and endorsing.

2. Cyber Cash:

- » This is an extension of wallet for credit cards, and it can be used in the same way to make payments with participating vendors.
- » CyberCash will not serve as an intermediate party for processing the cheque. That function will be handled directly by banks.

Extending electronic checks to existing payment systems:

- » Electronic cheque can be delivered either by direct transmission over a network or by e-mail.
- » In either case, existing banking channels can clear payments over their networks.
- » This has led to a convenient integration of the existing banking infrastructure and the Internet.

Q.No.37. Define smart cards. Write about different types of smart cards available?

Smart Cards:

- » Smart cards have an embedded microchip instead of magnetic strip.
- » The chip contains all the information a magnetic strip contains but offers the possibility of manipulating the data and executing applications on the card.

Types of smart cards: Three types of smart cards have established themselves.

- a. **Contact Cards:** Smart cards that need to insert into a reader in order to work, such as a smart card reader or automatic teller machines.
- b. **Contactless Cards** – Contactless smart cards don't need to be inserted into a reader. Just waving them near a reader is just sufficient for the card to exchange data. This type of cards is used for opening doors.
- c. **Combi Cards** – Combi cards contain both technologies and allow a wider range of applications.

Q.No.38. Write about Electronic purses?

- » Electronic purse is yet another way to make payments over the internet.
- » It is very similar to a pre paid card.
- » For E.g. Bank issues a stored value cards to its customers. Customer can then transfer value from their accounts to the cards at an ATM, a personal computer, or a specially equipped telephone. The electronic purse card can be used as an ATM card as well as a credit card.

- » While making purchases, customers pass their cards through a vendor's point of sale terminal.
- » No credit check or signature is needed.
- » Validation is done through a Personal Identification Number (PIN Number)
- » Once the transaction is complete, funds are deducted directly from the card and transferred to the vendor's terminal.
- » Merchants can transfer the value of accumulated transactions to their bank accounts by telephone, as frequently as they choose.
- » When the value on a card is spent, consumers can load additional funds from their accounts to the card.

Q.No.39. What are the risks and security considerations of internet's use by business houses for electronic commerce? What would be the general management concern?

Introduction: From years together computer security is not a big problem. Many companies did not concentrate much on such security aspects. But now computers are accessible even from distant locations. On the other hand there is an increasing trend in the number of hackers. In this scenario, the concept of computer security has become an important consideration.

Challenges in E-Commerce: Before all businesses accept this technology, several challenges should be accepted.

- a. **Reliability:** For conducting e-commerce the company has to depend upon services of several other organisations. So the company should consider the reliability of such organisations.
- b. **Scalability:** How can the Internet and individual services be scaled to meet the needs and expectations of all businesses?
- c. **Ease of use:** The methods developed should be easy to access for all trading partners and customers. We should also consider, whether small businesses are at a disadvantage due to lack of technical sophistication and resources?
- d. **Payment methods:** What will be an appropriate, safe and reliable payment method for electronic commerce?

Other considerations include the threat of computer viruses and the existence of unprofessional employees. Companies or consumers pass information through e-mail. If it is captured by a third party, great loss occurs to both the parties. Some businesses connect to the internet and they also store important information in the same location. Such businesses are subjected to tampering and their information may be accessed by third parties and may be damaged. For e.g. financial information such as credit card numbers may be stolen and used by unauthorized parties to make illegal purchases, resulting in damage to customers and business.

General Management Concerns: (M07 – 5M)

- a. **Loss of paper audit trail:** Paper is the prime source of audit trail that can be certified. The electronic certification may not be as reliable as ordinary certification.
- b. **Business continuity:** As the dependence on electronic means of doing business increases, business continuity becomes an important consideration. If EC system fails to work properly, even ordinary business activities can't be continued effectively.
- c. **Exposure of data to third parties:** As data is shared and organizations are connected to outside world, the possibility of data exposure to vendors, service providers and trading partners is significantly increased.
- d. **Potential legal liability:** The inability to complete transactions or meet deadlines or the risk of exposing information of trading partners creates significant legal risks.
- e. **Record safeguarding:** Electronic information has the same legal and statutory requirements as paper information. Organizations are responsible for safe storage, retention & retrieval of such information.
- f. **Segregation of duties:** In an electronic environment, the potential for occurrence of fraudulent transactions increases. Therefore, duties of people involved in EC must be appropriately segregated and reviewed.

Q.No.40. What tools are available to protect the information in network against intrusion or misuse? (N02 – 5M, RTP)

In spite of several risks, internet is the most advanced infrastructure for "anywhere, anytime" electronic communication between businesses, customers, suppliers. Several tools are now available to protect information and systems unauthorised intrusion or misuse:

- a. **Firewalls: (N03, M05, M07, M08–1M)** They control the flow of traffic between the Internet and the firm's internal LANs and systems. They are setup to implement the security policies desired by the organisation. A firewall is a proved, effective means of protecting the firm's internal resources from unwanted intrusion.
- b. **Encryption:** This allows information to transit the Internet while being protected from interception. There are two basic approaches to encryption:
 - ▶ Hardware encryption devices are available at a reasonable cost and can support high-speed traffic. If Internet is used to exchange information among branch offices or development collaborators, use of such devices can ensure that all traffic between these offices is secured.
 - ▶ Software encryption is typically employed in specific applications. For example, certain electronic mail packages provide encryption and decryption for message security.
- c. **Message authentication:** It makes sure that a message is really from whom it is supposed to be and that it has not been tampered. Regardless of a company's individual needs, Internet security policies and procedures should always be clearly defined.
- d. **Site blocking:** It is a software-based approach that prohibits access to certain web sites that are deemed to be inappropriate by management. For example, sites that contain objectionable material can be blocked to prevent employees from accessing these sites. Companies can also log activities and determine the amount of time spent on the Internet and identify the sites visited.

Q.No.41. Write about the possible legal issues in E-Commerce?

Introduction:

- a. Electronic transactions are used by businesses to issue instructions and to make commitments with external organizations, and many of these transactions are used to form legally binding contracts.
- b. For example, a contract is entered into when a buyer electronically issues a purchase order for goods at some fixed price and a seller electronically acknowledges the order.
- c. In legal terms, 'electronic order' means "offer," and the electronic acknowledgment means "acceptance," forming a contract.

Legal issues:

1. **Jurisdictional disputes:**

- » E-commerce throws up several new challenges. The most important issue is that of taxation.
- » For taxation purposes, the first question to be asked is where did the sale take place?
- » In case of E-Commerce there is no physical place of business. So, it is very difficult to determine the country/state/city from where the sale was concluded.
- » Similarly jurisdictional disputes arise in case of indirect taxes.

2. **Tax evasion:** Since there is no paper work and all the interaction between the buyer and the seller is done electronically, there is a possibility that the entire transaction is kept out of books of accounts. So, the transaction may all together escape from the tax net.

3. **Fraud detection:** E-commerce comes to us along with the in-built dangers of cyber crimes and frauds. Detection and Prevention of such frauds is very difficult.

4. **Potential legal liability:** As electronic commerce grows, number of new legal issues may arise. Organisations must be prepared to protect themselves from potential legal liabilities and ensure that their legal rights are protected.

5. **Internet security:**

- » Internet usage can be as secure as a company requires.
- » It is important to use some appropriate tools and procedures to protect information assets.
- » But we should not overreact and incur unnecessary costs and difficulties.
- » Organizations should take proactive role in monitoring electronic transactions and protecting assets.

Q.No.42. Write about Mobile Commerce. (RTP)**Meaning:**

- » Mobile Commerce or M-Commerce is about applications and services that are accessible from Internet-enabled mobile devices.
- » M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as cellular phones, Personal Digital Assistants (PDAs), etc. It is also known as next generation e-commerce.

Features:

- » It involves new technologies, services and business models.
- » It is quite different from traditional E-Commerce.
- » This technology is based on Wireless Application Protocol (WAP).

Facilities:

- » M-commerce enables users to access the Internet without any wired connection.
- » Using Bluetooth technology, smart phones are able to offer fax, e-mail, and phone capabilities all in one. Due to this, M-Commerce is being accepted by large number of mobile workforce.
- » The content delivery over wireless devices is faster, more secure, and scalable. So, there is a speculation that m-commerce will surpass wire line e-commerce.

Industries affected by M-Commerce: Following are the industries that are affected by M-Commerce.

- a. **Financial services:** Financial services, which include mobile banking (when customers use their handheld devices to access their accounts and pay their bills) as well as brokerage services, in which stock quotes can be displayed and trading can be done from the same handheld device.
- b. **Telecommunications:** Service charges, bill payment and account reviews in telecommunications, can all be conducted from a handheld device.
- c. **Service/retail:** Consumers can place orders and pay for them on the move.
- d. **Information services:** They include the delivery of financial news, sports updates and traffic updates to individual mobile devices.

Future expectation:

- » In order to exploit the potential market in m-commerce, handset manufacturers such as Nokia, Ericsson, Motorola, and Qualcomm are working with carriers such as 'AT&T Wireless' and 'Sprint' to develop WAP-enabled smart phones.
- » Mobile phones or PDAs have some constraints when compared to desktop computers. But they also open the door to a wide range of new applications and services.
- » Companies like IBM are experimenting with speech recognition software as a way to ensure security for M-Commerce transactions.

Q.No.43. Write about Bluetooth. (M07 – 5M, RTP)

Introduction: Bluetooth is a telecommunications industry specification that describes how mobile phones, computers and Personal Digital Assistants (PDAs) can be easily interconnected using a short range wireless connection.

Usage:

- » Using this technology, users can easily exchange files between computers, cellular phones, pagers, and Personal Digital Assistants over short distances.
- » Users can easily synchronize the information in their portable devices with a desktop or notebook computer.
- » User can also send or receive a fax, initiate a print-out and in general, have all mobile and fixed computer devices be totally coordinated.

Technical details:

- » To get Bluetooth facility, it is required to include a low cost transceiver chip in each device. Actually this transceiver transmits and receives data.
- » The transceiver uses a frequency band of 2.45 GHz that is available globally.

- » Each device has a unique 48-bit address from the IEEE 802 standard.
- » In addition to data, up to 3 voice channels are available.
- » Connections can be point-to-point or multipoint.
- » The maximum range is 10 meters.
- » Data can be exchanged at the rate of 1 Mbps (up to 2 Mbps in the second generation of the technology)
- » With frequency hop ^(=jump) scheme, devices can communicate even in the areas of electromagnetic interference.
- » Built-in encryption and verification is provided.

This technology got its name in honour of Harald Bluetooth, king of Denmark in the mid-tenth century.

Q.No.44. Write about Wi-Fi.

Introduction:

- » Wi-Fi stands for Wireless Fidelity.
- » Wifi (also WiFi, Wi-fi or wifi) is a brand originally licensed by the Wi-Fi Alliance and it is used to describe the underlying technology of Wireless Local Area Networks (WLAN) and it is based on IEEE 802.11 specifications.
- » This technology is designed for mobile computing devices such as laptops in LANs.
- » But now it is used for variety of other applications, including Internet and VoIP phone access, gaming, and basic connectivity of consumer electronics such as televisions and DVD players.
- » Several other standards are in development that allow Wi-Fi to be used by cars in highways in support of an Intelligent Transportation System. It can be used to increase safety, gather statistics and enable mobile commerce.

How it works?

- » A person with a Wi-Fi device, such as a computer, telephone, or Personal Digital Assistant (PDA) can connect to the Internet when it is near to access point.
- » The region covered by one or several access points is called a hotspot.
- » Hotspots can range from a single room to many square miles of overlapping hotspots.

Wi-Fi Certification: WI-FI certification means that it is compatible with other WI-FI CERTIFIED products. In other words the WI-FI CERTIFIED logo means it's a "safe" buy.

Areas where it is used?

- » Wireless technology gives complete freedom to a user to be connected anywhere if the computer is configured with a Wi-Fi CERTIFIED device.
- » Wi-Fi also allows connectivity in peer-to-peer mode which enables devices to connect directly with each other. This is very much useful in consumer electronics and gaming applications.
- » Wi-Fi can be used to create a Wireless mesh network.
- » Many corporations also provide wireless networks to their off-site and telecommuting workers to use at home or in remote locations.
- » Large companies and campuses often use Wi-Fi to connect buildings.
- » Wi-Fi networks are also found in busy public places like coffee shops, hotels, airport lounges and other locations where large crowds gather. This may be the fastest-growing segment of Wi-Fi service.
- » Soon, WI-FI networks will be found in urban areas providing coverage throughout the central city or even highways.

Limitation: When the technology was first commercialized users faced many compatibility problems. The Wi-Fi Alliance began as a community to solve this issue. The Alliance created another brand "Wi-Fi CERTIFIED" to indicate that the products are interoperable with other products displaying the "Wi-Fi CERTIFIED" logo.

The End