BBA-17

# Vardhaman Mahaveer Open University, Kota

# E – Commerce

# Vardhaman Mahaveer Open University, Kota

CONTENTS

## E – Commerce

# Unit - 1 : Introduction to E-Commerce

**Structure of Unit:**



## 1.0 Objectives

After completing this unit, students would be able to:

- Understand the complexity of e-commerce and its many facets.
- Explore how e-business and e-commerce ût together.
- Identify the impact of e-commerce.
- Recognise the benefits and limitations of e-commerce.
- Identify e-commerce framework and components which constitute e-commerce;
- Where the e-commerce is applicable and how useful to customer as well as the organization;
- Learn differentiated technological terms and their usage in the era;
- Get skeletal picture of e-Commerce
- Understand some of the issues associated with e- Commerce

## 1.1 Meaning and Concept of E-Commerce

For a common man e-Commerce is known as buying and selling of products (business transactions) and service over Internet. But it is more than just handling purchase transactions and transfer of funds over Internet. Despite electronic commerce fast roots in transactions between large companies, use of Internet in bank's and other financial institutions given way to bring electronic commerce to the individual consumer, thereby increase in the online commercial transactions. Fast developing electronic media opens door for business of all sizes. Smaller companies too can conduct business online, with lower cost. This is achieved either by replacing other networks or by using Internet as another communication medium and converting business data into digital and incorporating it with business parties.

- Electronic trading of physical goods and of intangibles such as information.
- All the steps involved in trade, such as on-line marketing, ordering payment and support for delivery.
- The electronic provision of services such as after sales support or on-line legal advice.
- Electronic support for collaboration between companies such as collaborative on-line design and

engineering or virtual business consultancy teams.

Some of the definitions of e-commerce often heard and found in publications and the media are:

*"Electronic Commerce (EC) is where business transactions take place via telecommunications networks, especially the Internet."* - ***E. Turban***

*"Electronic commerce describes the buying and selling of products, services, and information via computer networks including the Internet."* ***Whatis.com***

*"Electronic commerce is about doing business electronically."* ***P. Timmers***

*"E-commerce, ecommerce, or electronic commerce is defined as the conduct of a financial transaction by electronic means."* ***IACSIT***

The effect of e-commerce are already appearing in all areas of business, from customer service to new product design. It facilitates new types of information-based business process for reaching and interacting with customers – on-line advertising and marketing, on-line order taking, and on-line customer service, to name a few. It also reduces cost of overall business activities.

A key element of e-commerce is information processing. All steps of commerce, except for production, distribution, and delivery of physical goods, are forms of information gathering, processing, manipulation and distribution, which computers and networks are perfectly suited to handle. This information processing activity is usually in form of business transactions, for which several broad categories can be observed:

- Transactions between a company and the consumer over public networks for the purpose of home shopping or home banking using encryption for security and electronic cash, credit, or debit tokens for payment.
- Transactions with trading partners using EDI.
- Transactions for information gathering such as market research using barcode scanners, information processing for managerial decision making or organizational problem solving, and information manipulation for operations and supply chain management.
- Transactions for information distribution with prospective customers, including interaction advertising, sales and marketing.

From a managerial prospective, all of these transaction requires tight coordination and control among many participating organizations in order to minimize the exposure to risk.

**Activity A:**

1. Select an e-commerce company. Visit its Web site and describe its business model based on the information you find there. Identify its customer value proposition, its revenue model, the marketplace it operates in, who its main competitors are, any comparative advantages you believe the company possesses, and what its market strategy appears to be. Also try to locate information about the company's management team and organizational structure (check for a page labeled 'the Company', 'About Us' or something similar).

## 1.2 Electronic Vs Traditional Commerce

Electronic commerce is much broader and encompasses many more business activities than just Web shopping. For example, businesses conduct transactions with other businesses, with their employees, and

with governmental agencies. Here we distinguish electronic and traditional commerce for more specified knowledge of both:

### 1.2.1 Traditional Commerce

***Figure 1: Some examples which differentiate traditional and electronic commerce for better understanding***

In addition to buying or selling, firms engage in many other activities that keep them in business. For example, the seller of a product must identify demand, promote its products to potential buyers, accept orders, deliver its product, bill and accept payment for its product, and support its customers' use of its product after the sale. In many cases, sellers will customize or create a product to a customer's specification. These include the buyer and seller.

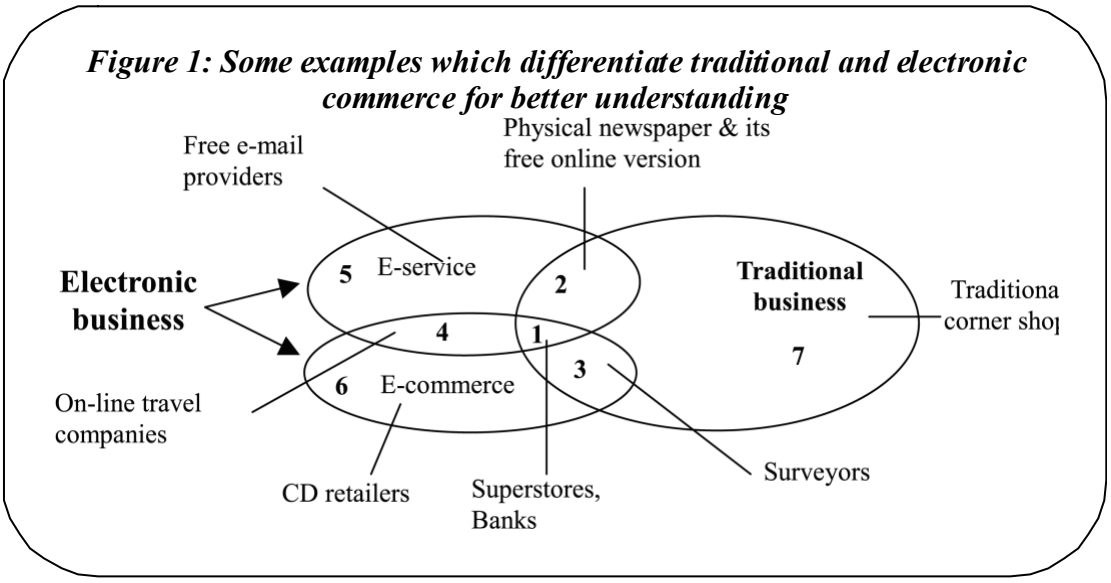


**Figure - 1.1**

***The Buyer:*** Buyers of a product also engage in additional activities similarly to the firms. Buyer begins by identifying their specific need. After they identify their need, they then search for products or services that will satisfy the specific need. In traditional commerce, buyers use a variety of search techniques. They may consult catalogs, ask friends, read advertisements, or examine directories. Buyers may consult salespersons to gather information about specific features and capabilities of products they are considering.

After buyers have selected a product or service that will meet the identified need, they must select a vendor who can supply the product or service. Buyers in traditional commerce contact vendors in a variety of ways, including by telephone, by mail, or contact at trade shows. After choosing the vendor, the buyer negotiates a purchase transaction. This transaction may have many elements, including delivery date, method of shipment, price, warranty, and payment terms, and will often include detailed specifications to be confirmed by inspection when the product is delivered or service is performed. If the buyer is a business, the negotiation process is very different and can be very complicated to deal.

When the buyer is satisfied that the purchased product or service has met the terms and conditions agreed to by both buyer and seller, the buyer will pay for the purchase. After the sale is complete, the buyer may have further contact with the seller regarding warranty claims, upgrades, and regular maintenance.

***The Seller:*** The seller conduct market research to identify customer needs. Even though businesses sell the

same product or services for many years, they still searching for a better way to improve and expand their offering to their customers. Firms conduct surveys, have salespersons talk with customers, run focus groups, and hire outside consultants to help them to improve and expand their offering. Once customer needs have been identified, sellers create the products and services that they believe will meet those needs.

The seller next step is to make potential customers aware that the new product or service exists. Sellers often engage in many types of activities such as advertising and promotion of their product or service to communicate information with their customers. Once a customer responds to the seller's promotional activities, the two parties must negotiate the details of a purchase transaction. The negotiation process might be very simple such as a buyer enter a store and purchase the item, or it could be very complicated and required prolonged negotiations if the buyer is at one place and the product is in another place.

After the seller and buyer resolve delivery logistics, the seller ships the goods or provides the services and sends an invoice to the buyer. Sometimes, the seller will require the buyer to pay in advance before delivering the product. In conclusion of the sale, the seller will often provide continuing after-sale support for the product or services that was sold. The seller will also provide support, maintenance, and warranty work to help ensure that the customer is satisfied and will return to buy again.

### 1.2.2 Electronic Commerce

Firms have used various electronic communications tools to conduct different kinds of business transactions. Banks have use used EFTs (Electronic Fund Transfer) to move customers' money around the world, all kinds of businesses use EDI to place orders and send invoices, and retailers have used television advertising to generate telephone orders from the general public for various types of merchandise for many decades.

***Business Processes in Commerce:*** In traditional commerce, the products are hard to sell with electronic commerce because the buyers would prefer to touch, smell, or examine closely before they would buy them. These products can be identify as: high-fashion clothing and meat or produce. Without feeling or examine the products closely, buyers would likely not purchase the products.

Some products such as books or CDs, are good candidates for electronic commerce because customers do not need to experience the physical characteristics of the particular item before they buy it. For example, since the copy of the new book is identical to other copies, and since the customer is not concerned about fit, freshness, or qualities, customers are usually willing to order the title without examining the specific copy they will receive.

***Business Process Suitability to Type of Commerce:*** Well Suited to Electronic Commerce

- **Selling of Commodity Ttems:** Commodity item is a product or service that is hard to distinguish from the same products or services provided by other sellers:

  *Examples:* gasoline, soap, computer, office supplies, books and CDs sold by Amazon.com, and airline transportation.

- **Product's Shipping Profile:** Shipping Profile is the collection of attributes that affect how easily a product can be packaged and delivered. A high value-to-weight ratio can help by making the overall shipping cost a small fraction of the selling price.

  *Example:* an airline ticket

- A product that has a strong brand identity-such as a Sony CD player- is easier to sell over the Web than an unbranded item, because the brand's reputation reduce the buyer's concern about quality

when buying that item sight unseen.

- Other items are items that appeal to small, but geographically dispersed, groups of customers.

  *Example:* collectible comic books.

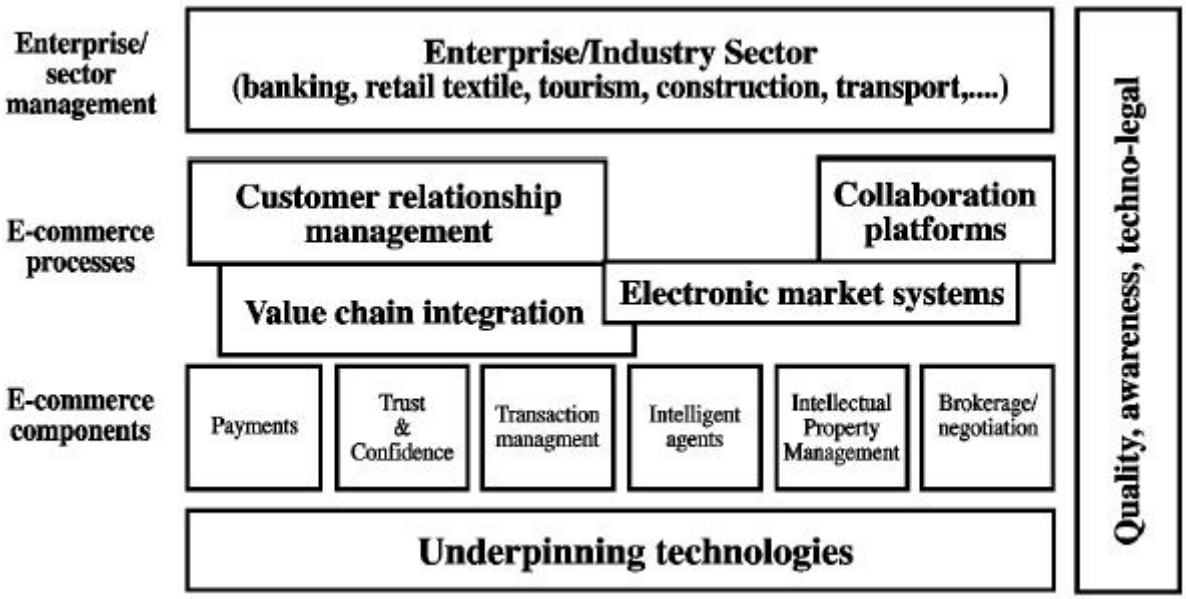


***Figure - 1.2 : Framework of Eelectronic Business Components***

In the following table you can see in table form the differences in media used for traditional and e-commerce. Please notice that as far as e-commerce is concerned everything can be done through a server:

| Action | Traditional commerce | E-commerce |
|---|---|---|
| Acquire product information | Magazines, flyers, online catalogs | Web pages |
| Request item | Printed forms, letters | E-mail |
| Check catalogs, prices | Catalogs | On-line catalogs |
| Check product availability and confirm price | Phone, fax | E-mail |
| Generate order | Printed form | E-mail, web pages |
| Send /Receive Order | Fax, mail | E-mail, EDI |
| Prioritize order | | On-line database |
| Check inventory at warehouse | phone,fax | On-line database, web pages |
| Schedule delivery | Printed form | E-mail, On-line database |
| Generate invoice | Printed form | On-line database |
| Receive product | Shipper | Shipper (unless it is electronic) |
| Confirm receipt | Printed form | E-mail |
| Send/Receive Invoice | Mail | E-mail, EDI |
| Schedule payment | Printed form | EDI, On-line database |
| Send /Receive Payment | Mail/courier | EDI |

***Table 1: Media used in electronic commerce***

***Combination of Electronic and Traditional Commerce:*** strategies works best when the business process includes both commodity and personal inspection elements.

- Sale or purchase of automobiles
- Online banking
- Roommate-matching services
- Sale purchase of investment and insurance products

***Advantages of Electronic Commerce:***

- Can increase sales and decrease sale costs
- A small firm's promotional message out to potential customers in every country in the world with good ad
- Reach narrow market segments that are geographically scattered
- The Web is particularly useful in creating virtual communities for specific types of products or services
- A business can reduce the costs of handling sales inquiries, providing price quotes, and determining product availability by using electronic commerce in its sales support and order-taking processes
- Increases sales opportunities for seller, it also increases purchasing opportunities for the buyers
- Businesses can identify new suppliers and business partners
- Increases the speed and accuracy with which businesses can exchange information, which reduces costs on both sides of transactions
- Provides buyers with a wide range of choices than traditional commerce
- Provides buyers with an easy way to customize the level of detail in the information they obtain about a prospective purchase and they can instantly access to detail information on the Web without waiting for days

***Benefits for General Welfare of Society:***

- Electronic payments of tax refund, public retirement, and welfare support cost less to issue and arrive securely and quickly when transmitted over the Internet
- Electronic payments can be easier to audit and monitor than payments made by check, providing protection against fraud and theft losses
- Electronic commerce enables people to work from home

***Disadvantages of Electronic Commerce:***

- Many products and services require that a critical mass of potential buyers be equipped and willing to buy through the Internet.
- Costs and benefits have been hard to quantify
- Many firms have had trouble recruiting and retaining employees with the technological, design, and business process skills needed to create an effective electronic commerce
- Firms also have difficulty of integrating existing database and transaction-processing software designed for traditional commerce into the software that enables electronic commerce
- Firms also face cultural and legal obstacles to conducting electronic commerce

**Activity B:**

1. Examine the experience of shopping on the Web versus shopping in a traditional environment. Imagine that you have decided to purchase a digital camera (or any other item of your choosing). First, shop for the camera in a traditional manner. Describe how you would do so (for example, how you would gather the necessary information you would need to choose a particular item, what

stores you would visit, how long it would take, prices, etc.). Next, shop for the item on the Web. Compare and contrast your experiences. What were the advantages and disadvantages of each? Which did you prefer and why?

## 1.3 Difference between E-Commerce and E-Business

Mostly these two words are mis-stated on a regular basis. It seems that people don't quite understand the difference. They are very similar, but e-commerce is a function of e-Business and that's where the clarification is needed. The term "e-business" was coined by IBM's marketing and Internet teams in 1996. E-business is defined as "A business that operates partially or primarily over the Internet, frequently providing services to another businesses." E-commerce is explained as "commercial activity conducted over the internet". E-business includes business procedures across the entire value chain: electronic purchasing and supply chain management, processing orders electronically, handling customer service, and cooperating with business partners.

Any business conducted via the web or over the web would then become e-Business. E-Commerce is a function or an attribute of e-Business. E commerce is the process of buying, transferring, or transacting any products, services, and/or information via computer networks, including the internet, e-commerce can also be favorable from many perspectives including business procedures, service, learning process, collaborative, group of people. E-commerce involves the application of knowledge management systems. All e-Business is not e-Commerce.

*For example, Mr. X owns a plumbing store/company and has a static/brochure website built to maintain a web presence, adds himself to local search, and makes his services searchable and findable for online users. He does not sell anything over the internet. His static/brochure website is performing e-Business by acting as an advertising platform and virtual storefront for his business.*

*Ms. Y owns a custom Teddy Bear Store on the internet. You just go to her site, pick and order your bear; it is ready, shipped and sends to you. She has no block and mortar storefront. Jenny is conducting e-Commerce over the internet through her commercial action. Her e-Commerce site is an e-Business as it executes and operates a business or business activities on the web.*

## 1.4 E-Commerce Framework

From the business activities already taking place, it is very clear that e-commerce activities will be built on existing technologies. There would be make use of computers, communication networks communication software's, and there would be nascent flow of information. There are varieties of possible e-commerce applications, including both inter-organizational and consumer oriented examples. None of these would be possible without each of the building blocks in the infrastructure:

- Common business services, for assisting buying and selling procedures.
- Messaging and information sharing, as a way to send and retrieve information.
- Multimedia content and network publishing, for creating a product and means to communicate about it.
- The information superhighway - the very foundation for providing the highway system along which all e-commerce must travel.

There are two pillars in support of e-commerce-application and infrastructure which are just indispensible:

- Public Policy: for governing issues like universal access, privacy and information pricing.

- Technical Standards: to state nature of information distribution. And to check compatibility across whole network.

For better understanding of integrations of various infrastructure components in our framework, let's use analogy of a traditional transportation business. Any flourishing e-commerce application will be requiring an I-way infrastructure as it also needed in usual commercial activity which would carry goods from point to point to provide with goods and services when demanded by the consumer at any point of time and at desired location. I-way should be network of interconnected data highways through, telephone, cable TV wires, DSL connections, wireless networks etc.

I-ways are rapidly attain new on-ramps and also involves small highway system, completely away. There are so many constructors whether they are in opposition or in alliance with each other and every one are in an effort to convince traffic to use their on-ramps or sections of the highway because, like toll-ways, revenues in e-commerce are based on vehicular traffic, vehicle transporting information or multimedia content. In business there are countless transaction and the final winner always choosing the best alternative of technology which matches future business needs by it.

Highways construction is not sufficient. There must be require of transport vehicles, instruction for routes must be there and certainly the transportation costs should be paid. On the I-way, the nature of vehicular traffic is enormously mandatory.

$$Movies = video + audio$$

$$Digital\ games = music + video + software$$

After making multimedia contents some question rise like:

- Where these vehicles stored?
- How manage multimedia cargo and what type of distribution made for store houses?

There are awareness regarding multimedia content in electronic highway system in the form of electronic documents, and these documents are often digitized, compressed and stored in computerized libraries or multimedia storage warehouse called servers that are linked by transport networks to each other and to the software and hardware clients that allow customers to access them.

If, there is talk about the mode by which vehicles are move from one distribution house to another is through traditional way, where commercial transaction, diesel engines or gasoline powered motors move the vehicle with the roadways but on another hand I-way, where all the transaction run in any number of forms i.e. e-mail, EDI or exact point file transfer.

In emerging world it's very tough task to manage all highly complex transaction with full reliability. The logistical matters are involved while managing complex transaction. The basic aim behind that all the work is to provide better solution and making significant work with all other relevant variables while entering in electronic market place. Always keep in mind that while tackling vehicle traffic our consumer always protected from frauds, taxation policy, environment impact and many more.

In final point of e commerce framework explains technical standards which play a vital role in this revolution. Standard which play a vital role in this revolution? Standards which are very important in the whole system of e commerce, by the help of these standards works would be continue and peaceful integration with all transportation network as well as access of information on any type of device the consumer choose- laser disc, PCs, portable hand-held devices or television + set up boxes and all types of operating systems.

## 1.5 Components of E-Commerce

Beyond building the basic web site there are the five key components of an e-commerce site. Figured for those that might have bought things online they know what a shopping cart is and what it does. What many have never seen is what is under the hood and what you have to do at the basic level from the full out-of-the box e-commerce storefront to the customized built from scratch version.

1. **Products Catalog:** This is obviously the core of the storefront because it is the catalog of what you sell. You need to have good images and many storefronts allow for lots of options which you could go crazy with so be careful. Options are good with things like T-Shirts where you have a product and need specifications to fulfill the order.

2. **Categories:** These go with the products catalog and help you organize the products. It can get very cumbersome and if you will remember the earlier days of Amazon.com they had tabs for categories which worked well when they had just books, music and DVD's. As they expanded their tab structure got out of control which you can see below:

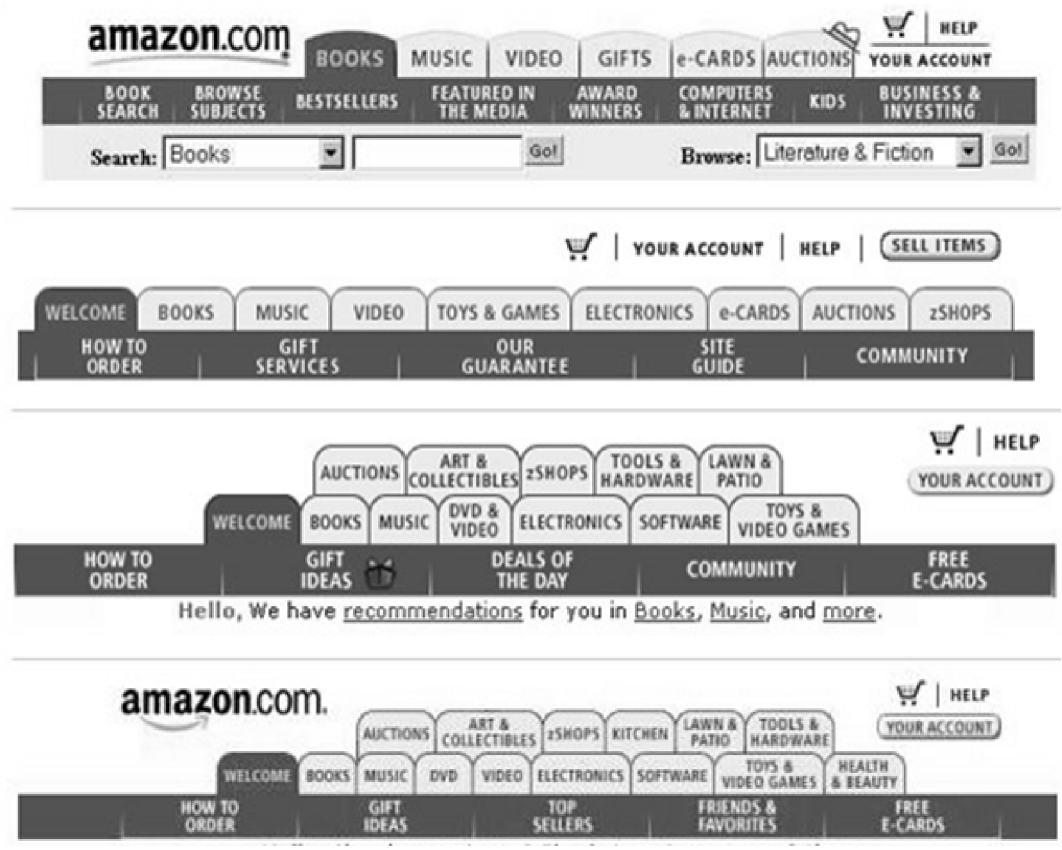


**Figure - 1.3**

It is a lesson in carefully structuring your catalog in a way that people can find things easily and quickly so they add it to their cart because you still to get them to put in their credit card.

3. **Promotions:** The whole purpose of promotions is to draw customers back to your store and get them to buy. The concept of things going on sale is old as people have been selling things. We all love a sale and some of us even live for them which is why promotions are key in customer retention and acquisition. Many times customers will find your site and buy something but the big challenge is bringing them back and learning their behavior (personalization is for another post)

4. **Shipping and Taxes:** This is probably the most boring and mundane but if you don't do this right a few things will happen – you will get stuck with the shipping bill and lose money, you will estimate taxes wrong or not add them in and lose money. Are you getting the picture? You will need to get the right shipping partners that fit your products and deliver to where your customers are. You will also need to check if you have to pay taxes locally and also if you ship to certain states. It is a complicated subject and I would recommend this great article from Startup Nation on e-Commerce Sales Tax.

5. **Payments/Checkout:** This is last step for buyers and for integrators and web site developers the most challenging. You are simultaneously dealing three separate parties – merchant account provider, secure certificate provider and shopping cart solution and if one thing does not work correctly the whole site is useless. You can also have fingers pointing at other providers when are trying to resolve an issue. You need to make sure you have the accounts tested and working and when testing turn on the logs and error tracking. The last thing you want if for errors in the checkout process for paying customer. If they get an error once they might re-try and check their stuff. If it happens the second time you will definitely lose them.

   When you get down to the actual elements of commerce and commercial transactions, things get slightly more complicated because you have to deal with the details. However, these details boil down to a finite number of steps. The following list highlights all of the elements of a typical commerce activity. In this case, the activity is the sale of some product by a retailer to a customer:

   • If you would like to sell something to a customer, at the very core of the matter is the something itself. You must have a **product or service** to offer. The product can be anything from ball bearings to back rubs. You may get your products directly from a producer, or you might go through a distributor to get them, or you may produce the products yourself.

   • You must also have a **place** from which to sell your products. Place can sometimes be very ephemeral — for example a phone number might be the place. If you are a customer in need of a massage, if you call "Judy's Massages, Inc." on the telephone to order a massage, and if Judy shows up at your office to give you a massage, then the phone number is the place where you purchased this service. For most physical products we tend to think of the place as a store or shop of some sort. But if you think about it a bit more you realize that the place for any traditional mail order company is the combination of an ad or a catalogue and a phone number or a mail box.

   • You need to figure out a way to get people to come to your place. This process is known as **marketing.** If no one knows that your place exists, you will never sell anything. Locating your place in a busy shopping centre is one way to get traffic. Sending out a mail order catalogue is another. There is also advertising, word of mouth and even the guy in a chicken suit that stands by the road waving at passing cars.

   • You need a way to accept **orders.** At Wal-Mart this is handled by the checkout line. In a mail order company the orders come in by mail or phone and are processed by employees of the company.

   • You need a way to accept **orders.** At Wal-Mart this is handled by the checkout line. In a mail order company the orders come in by mail or phone and are processed by employees of the company.

   • You also need a way to accept **money.** If you are at Wal-Mart you know that you can use cash, check or credit cards to pay for products. Business-to-business transactions often use purchase

orders. Many businesses do not require you to pay for the product or service at the time of delivery, and some products and services are delivered continuously (water, power, phone and pagers are like this). That gets into the whole area of **billing** and **collections.**

• You need a way to deliver the product or service, often known as **fulfilment.** At a store like Wall-mart fulfilment is automatic. The customer picks up the item of desire, pays for it and walks out the door. In mail-order businesses the item is packaged and mailed. Large items must be loaded onto trucks or trains and shipped.

• Sometimes customers do not like what they buy, so you need a way to accept **returns.** You may or may not charge certain fees for returns, and you may or may not require the customer to get authorization before returning anything.

• Sometimes a product breaks, so you need a way to honour warranty claims. For retailers this part of the transaction is often handled by the producer.

• Many products today are so complicated that they require **customer service** and **technical support** departments to help customers use them. Computers are a good example of this sort of product. On-going products like cell phone service may also require on-going customer service because customers want to change the service they receive over time. Traditional items (for example, a head of lettuce), generally require less support that modern electronic items.

You find all of these elements in any traditional mail order company. Whether the company is selling books, consumer products, information in the form of reports and papers, or services, all of these elements come into play.

In an e-commerce sales channel you find all of these elements as well, but they change slightly. You must have the following elements to conduct e-commerce:

- A product
- A place to sell the product - in e-commerce, a Web site displays the products in some way and acts as the place
- A way to get people to come to your Web site
- A way to accept orders - normally an on-line form of some sort
- A way to accept money - normally a merchant account handling credit card payments. This piece requires a secure ordering page and a connection to a bank. Or you may use more traditional billing techniques either online or through the mail.
- A fulfilment facility to ship products to customers (often outsource-able). In the case of software and information, however, fulfilment can occur over the Web through a file download mechanism.
- A way to accept returns
- A way to handle warranty claims if necessary
- A way to provide customer service (often through email, on-line forms, on-line knowledge bases and FAQs)

## 1.6 E-Commerce and Media Convergence

The effect of convergence has already being felt. Most of the companies are pooling their talents and resources through different market expansion strategies like alliances, joint ventures etc to make electronic market place a reality. They are motivated by the form that e- commerce applications will take, about which they don't know might reduce their risk in light of uncertainty in global market place.

E-commerce has been permanently linked with the idea of convergence of industries giving importance to information. Convergence has been broadly defined as bonding various forms of communication for the purpose of new form of information based commerce. There are two types of convergences being constantly used:

a. *Multimedia,*
b. *Cross Media.*

*Multimedia convergence* applies to conversion of, digital content, text, voice over, data and image. Whereas C*ross Media convergence* refers to integration of different industries like- communications, publications and entertainment media based on multimedia content.

Both these type of convergence mostly related. We can keenly take example of smart Televisions which are connected to internet. Let us say while watching a documentary on migratory birds in India, viewer becomes interested to have knowledge on migratory birds can instantly use internet via interactive television and can have knowledge about them. The convergence is driven by very simple technological advancement:-

- ***Convergence of Content*:** it is used to translate all types of informational contents, business documents, videos, movies and music etc into digital form, so that it can be easily processed, searched, sorted, converted so that they are matched up with present information systems.
- ***Convergence of Transmissions*:** in this the information is compressed and stored in a digital form enabling it to be transmitted through radio, internet and wirelessly. The breakthrough in technologies has created such equipments creating an ease of transmission of digital content.
- ***Convergence of Information Access Devices:*** nowadays digital information can be easily accessed through various devices like mobile phones, laptops palmtops.

Convergence is mainly driven by the following conditions prevailing in the market:

- The large number of availability of increasingly low cost technologies enhancing communication systems and operating systems performances.
- Ever increase in entrepreneurs who are dependent upon anticipating end user demand of the new applications.
- Induction of competition from regulatory authorities in to monopoly markets to facilitate rapid development and deployment of new applications.

## 1.7 Anatomy of A-Commerce Application

Here we've explained structure of an e- commerce application. No one knows whether the applications used in e-commerce will be successful in long run or not. The structure of e-commerce applications are depicted here below:

E-Commerce applications are:

1. Multimedia Content for E-Commerce Applications

2. Multimedia Storage Servers and E-Commerce Applications

    i. Client-Server Architecture in Electronic Commerce

    ii. Internal Processes of Multimedia Servers

    iii. Video Servers and E-Commerce

3. Information Delivery/Transport and E-Commerce Applications

4. Consumer Access Devices.

**Multimedia Content for E-Commerce Applications:** Multimedia contents can stimulate and create traffic for electronic commerce applications. The term multimedia technical defines as, "the use of digital data in more than one format, such as the combination of text, audio, video, images, graphics, numerical data, holograms, and animations in a computer file/document." Multimedia is linked with Hardware machinery in different networks. The Accessing of multimedia content depends upon hardware capability of the customer.

**Multimedia Storage Servers and E-Commerce Applications:** E-Commerce requires tough servers to store and allocate large quantity of digital content to consumers. These Multimedia storage servers are large information warehouses capable of handling various contents, ranging from books, newspapers, movies, games, and X-ray images in digital format. These servers derive their name because they serve information upon request. They must be able to handle large-scale distribution, guarantee security, and complete reliability.

**Client-Server Architecture in Electronic Commerce:** All e-commerce applications are following client-server model. Clients are devices plus software which request information from servers or interact known as message passing Mainframe computing, which meant for "dump". The client server model is allowing clients to interact with server through request-reply sequence which is governed by a pattern known as message passing. The server is managing application tasks, storage and security and provides scalability-ability to add more clients and client devices (like Personal digital assistants to Pc's.)

**Internal Processes of Multimedia Servers:** The internal processes which are involved in the storage, retrieval and management of multimedia objects that are integral to e-commerce applications. A multimedia server is a hardware & software combination that converts raw data into usable digital information and then delivers it out. It captures, processes, manages, & transfers text, images, audio & video. It must be done to tackle thousands of simultaneous customer.

**Video Servers & E-Commerce**

The e-commerce applications related to digital video include

1. Telecommunications and video conferences
2. Geographical information systems that require storage & navigation over maps
3. Corporate multimedia servers.
4. Postproduction studios
5. Shopping kiosks.
6. Consumer applications will include video-on-demand.

**Information Delivery/Transport & E-Commerce Applications:** In this transporters generally are telecommunication companies, wireless industries etc. and those who provide internet connections. These transporters use networks to distribute information through routes. It has been observed that transport routes are boundless for e-commerce application. Every transporter must face following set of challenges while completing his task in his respective industry:-

- Telecom based: Awareness of all competitors which are long-distance or telephone service providers. Telecom sector improve itself and provide the numerous channels of live video with a single telephone wire.
- Cable based: These service providers depend upon the coaxial cable like transport roads and decide the accurate broadband application

- Computer network based: Rarely use of telecom and cable highways and many of service providers are regularly dial-up linkage with lower bandwidth like prodigy, CompuServe and America online are the examples of on-line transport architecture.

**Consumer Access Devices**

These are the devices through which a consumer can access to the data transfer highways. Following are the few devices through which a consumer can enter into a network:

- Computers with audio & video
- Mobile computing
- Telephonic devices
- Videophone
- Consumer electronics
- Television + set-top box Game systems.
- Personal digital assistants (PDAs)
- Pen-based computing, voice-driven computing.

**Activity C:**

1. Visit the eBay.com Web site and look at the many types of auctions available. What are the top three market opportunities you would pursue based on the goods and auction community in evidence at eBay?

## 1.8 E-Commerce Consumer – Consumer Applications

People needs entertainment on demand including videos, games, news on-demand, electronic retailing via catalogues etc. Presently we are taking the video on-demand. Why most companies betting heavily on this? The needs and preferences of the consumer are changing with a rapid pace. We can take example of changes that are being made by the Direct to Home (DTH) services. Tata sky now offers variety of applications online like cookery shows, recording of daily soaps and various other services. This shows that ever diversifying needs of consumers are also giving direction to changes to the applications being used. The reasons behind that are:

1. Two billion televisions all around the world.
2. People spending nearly half their free time watching television.
3. Every evening, more than one-third of the population is in front of a television.
4. Sight, sound, and motion combine to make television a powerful means of marketing.

**Consumer Applications and Social Interaction**: It has been observed historically that successful technologies are those technologies which make their presence felt socially. Telephone has been a success as it has connected people together socially. In 1970, in India no one had TV. By 1985 about 75 percent of households did. Now contrast with Telephone. Telephone came into India in year 1881 and had just 93 subscribers, in year 2012 it rose to 31.53 million subscribers. Penetration was slower for Telephone than for TV because of the effort needed to set up the wiring infrastructure. The impact of both was good on commercial activities, social and consumer behavior and entertainment habits. What do Consumers actually want? They want quality and cost of service being provided. Change in systems according to their needs.

## 1.9 E-Commerce Consumer – Organization Applications

The business environment is changing rapidly. Most of the companies are looking forward outside and

within to shape business strategies. These activities include private electronics connections to customers, suppliers, industry groups and distributers etc. the super high ways are expanding at a rapid pace, thus allowing business to exchange information. E-commerce uses are consistently broadening. It is nowadays used in various industries. For an instance e-commerce is used in retailing industry and production outfits.

In retailing industry we can see the revolutionary changes are being observed. Whole stores now are operating in online format. The most prominent names in this online shopping are flipkart.com, myntra.com and jabong.com. Through using e-commerce retailers are filling their orders and slashing their back office cost. Overall they've invested in a technology but now are reaping the fruits of it. Whereas manufacturers are using concepts like Just in Time (JIT), inventory management to reduce their operational costs to gain competitive advantage over their competitors and leading to higher profits.

Thus we can conclude that e-commerce in present era has became a tool for revolutionizing an organizations marketing and production techniques by creating competitive advantage.

**Activity D:**

1. Prepare a 3- to 5 page research report on the current and potential future impacts of e-commerce technology on the publishing industry.

## 1.10 Summary

- Electronic commerce explains the buying and selling of products, services, and information via computer networks including the Internet.
- E-business is defined as "A business that operates partially or primarily over the Internet, generally providing services to other businesses." E-commerce is described as "commercial activity conducted over the internet".

## 1.11 Self Assessment Questions

1. What is e-commerce? Illustrate with live examples.
2. Why e-commerce is needed? Explain its need based analysis.
3. Explain concept of e-commerce with model specific examples. Write some definitions also.
4. Make differentiation between traditional and electronic commerce.
5. How e-commerce and e-businesses are different? Write a specific and short essay.
6. Elaborate the framework e-commerce and its process.
7. What are components of e-commerce? Write all the compulsory components for its existence.
8. What is media convergence? Clarify whether media convergence supports to e-commerce or e-commerce provides basic infrastructure to media convergence. Write in your own words and arguments.
9. Describe the anatomy of e-commerce.
10. Write applications of e-commerce towards consumer and organizations.
11. What are consumers to organization applications of e-commerce?

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# Unit - 2 : Importance of E-Commerce

**Structure of Unit:**



## 2.0 Objectives

After completing this unit, students would be able to:

- Understand the e-environment and its forces;
- How e-commerce is commerce is important for development of whole;
- Why and where we need e-commerce;
- Features and functionalities of e-commerce and e-businesses;
- Learn differentiated business models of e-commerce;
- Disadvantages of using e-commerce.

## 2.1 E-environment

All of the organizations operate within an environment that influences the way in which they conduct their businesses. Development of the strategy of business is deeply influenced by the macro-environment it works in. To review all these macro-environmental factors SLEPT frame work is adopted widely. Here we've used SLEPT since it is useful to stress importance of law in influencing internet marketing practices. The SLEPT factors are as under:-

- Social Factors: these include influence of customers view in determining uses of internet for different activities.
- Legal, Ethical and taxation: it is to determine the methods which can be used to promote and sell products online. Basically these are determined by law on behalf of customers.
- Economic factors: difference in the economic conditions of various countries and between the different regions of the nation.
- Political: impact of governments and the rules that are used to govern marketing organizations.
- Technological: the technology which is being offered at present to the consumer by the marketer.

Here we've observed that for each factors a new issue has been raised for the managers who are looking after e-commerce trading.

For e-commerce, most significant influences are those of the market place in which it operates. It is shaped by the need of customers, competitors, intermediaries and suppliers. There are influences by government, national and international economic conditions and legislation together. In the end, technology and innovations influence the environment of the e-commerce. The main question arises is that are the environmental influences important? The answer is yes. These influences have major impact on success of a company. It is important for a company that current environment needs to be monitored and future environmental trends to be anticipated. A company should give charge to monitor all these changes to an employee.

### 2.1.1 Social and Legal factors

E-commerce is generally governed by the factor that how internet is adopted by the consumer. If a consumer is internet savvy or we can say frequent user of internet. It is also affecting the business externally thus becoming a part of the e-commerce environment. Following are the factors governing internet adaptation:

**a.** ***Accessing Cost*****: i**f the accessing cost of internet is high customers will be reluctant to use internet and it will also affect the e-commerce activity. Accessing cost implies to the cost of connecting to the internet through DSL cables, broadband and wireless networks.

***b. Value Proposition:*** there is need to perceive by the consumers, what is being offered online that is not available in normal market. E.g. At flipkart.com latest mobile set of Samsung is available at lower price than the market and it being delivered free of cost at doorsteps of customer. This creates value preposition.

***c. Easy to Use:*** is it easy connecting to the internet at the first time using ISP.

***d. Security:*** whether the web site with which the transactions would be made is secure or not. I.e. are there any chances of phishing, account hacking, use of credit card details by hacker etc.

### 2.1.2 Economical and Competitive Factors

The economy and competition is different in different countries. Most developed countries are initially targeted by the managers who develop e-commerce strategies. A framework was developed by Booz Allen Hamilton (2002), for assessment of an e-economy[1]. The knowledge of different economies is important for manager of e-commerce website. We can take example of African economy; most of the African countries are under developed economies where it would become difficult for e-commerce website manager to promote their goods and services due to disparities in income. Roussel (2000), stated that economic, regulatory, and cultural issues among factors that affect use of internet for commercial transactions.

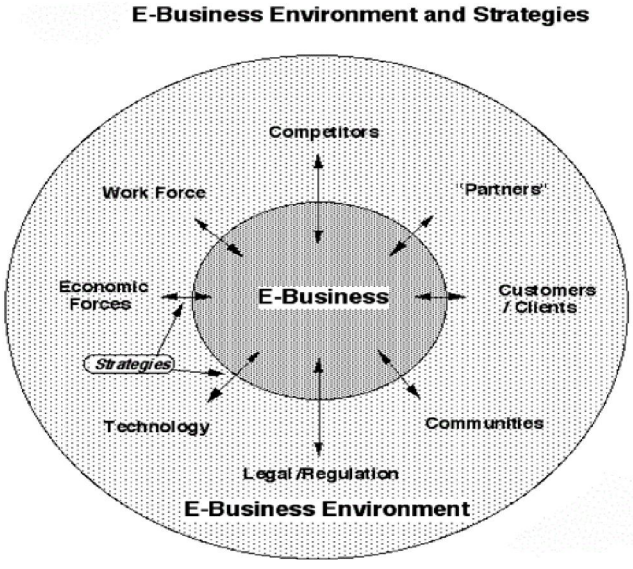


**Figure 2.1**

**Activity A:**

1. Make a list of all the social, legal, economical, political and technological issues what a manager of a sell-side e-commerce website needs to consider avoiding any kind of damage to relationship with its users and facing prosecution.

## 2.2 Importance of e-commerce

For business purpose, e-commerce is more cost effective method than other traditional commerce method. Another aspect of this method is the cost for the middleperson to trade their products can be save and divert to another through e-commerce. For instance, a giant computer enterprise HP which practice such a process by running most of their business by internet without connecting third parties. Following are some points which shows the significance of e-commerce:-

1. ***Exploiting of New Business:*** Mostly speaking that e-commerce put emphasis on generating and exploiting new business opportunities and work on the phrases like "do more with less" and "generate business value".

2. ***Facilitate the Customers:*** e-commerce is to facilitate the customer to have an escalating say that in what type of products should be made, how products should be made and how services should be delivered, all the points shows that the movement from a slow order accomplishment process with small understanding of what is taking place within the firm, to a faster and right one open process with customers having better control.

3. ***Business Transaction Improved***: Over the various networks for business transaction of buying and selling of goods and services e-commerce actions to improve the execution of all business transaction.

4. ***Enhancing Performance:*** E-commerce enhances the performance effectively. Its provide greater customer satisfaction, better quality and also provide better corporate decision making.

5. ***Mounting Returns***: Most of the business houses use such technology which reduces the cost and increases the returns in term of profit. E-commerce has the ability to reduce the cost and increase the returns by building new markets for old products.

6. ***Enhancing the Organizational Model***: E-commerce facilitates an organizational model which is basically different from the earlier period. This is a control organization which is based on information. The rising forms of technically organizational structure engage changes in executive responsibilities, communication, flow of information flows and work group structures.

7. ***Integrate Operation***: In e-commerce involves all integrated operation i.e. systematize, method, procedure and tracks transactions. It also includes consumers making electronic payments and funds transfers system.

## 2.3 Significance of E-commerce and E-business

As the managers are required to access the deep impact of e-commerce and e-business on to their market places and organization they need to respond and access the need of investment. These should be essential parts to be considered while formulating e-business and e-marketing strategies. For this a marketing research should be conducted to determine the current level of adaptation of internet for different activities among competitor and consumers in the market place. Next explained is the adaptation of internet technology by consumer and business concerns.

Consumer adaptation of digital technology: Over the last ten years there has been rapid adaptation of three key digital platforms which enables access to e-commerce services there has been substantial increase in adaptation of digital technology by consumers over the last fifteen years (MORI Technology tracker).

Though e-commerce opens a world of businesses to customers and a world of customers to business, the model clearly shows that e-Business incorporates both this function and the provision of more significant opportunities for interaction, transaction and profitability in back office and supply chain systems. Many supply chain systems are, in fact, e-commerce tools, eg procurement, inventory management, CRM and some ERP systems. Full integration of electronic technologies throughout front and back end business processes will provide significant benefits.

## 2.4 Need of E-commerce

**Business Models of e-commerce**

E-commerce is the process of buying and selling of various products and services by businesses through the Internet. It deals various kind of business concern, from retail site of the consumer, which includes auction. The main focus is to concentrate on business substitutes involving goods and services between various corporations.

E-commerce is the purpose of Internet and the web to Conduct business but when we concentrate on commercial deals among organizations and individuals demanding selective information systems under the guarantee of the firm it accepts the form of e-business. Nowadays, the word „e is hitting momentum. If you re looking to get into this business, one of the fore most thing you have to have is a Virtual Private Cloud Hosting keeping the traffic in mind and respecting customers valuable time.

There are primarily five types of e-commerce models:

### 2.4.1 Business to Consumer (B2C)

B2C stands for Business to Consumer as the name suggests, it is the model taking businesses and consumers interaction. Online business sells to individuals. The basic concept of this model is to sell the product online to the consumers.

**B2C Business Model**

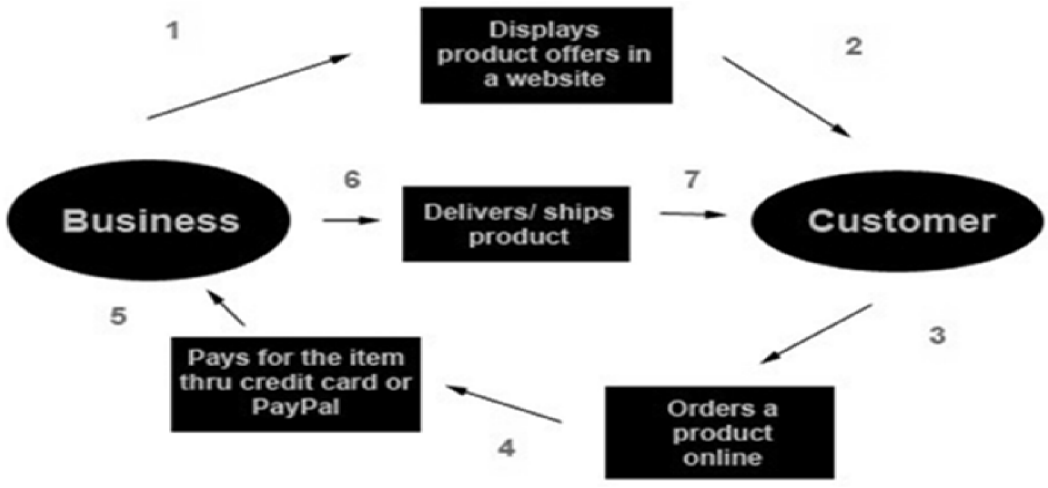


**Figure - 2.2**

B2C is the indirect trade between the company and consumers. It provides direct selling through online. For example: if you want to sell goods and services to customer so that anybody can purchase any products directly from supplier's website.

It is the second largest and the earliest form of e-commerce. Its origins can be traced to online retailing (or e-tailing).13 Thus, the more common B2C business models are the online retailing companies such as Amazon.com, flipkart.com, jabong.com,. Other B2C examples involving information goods are E-Trade and Travelocity. The more common applications of this type of e-commerce are in the areas of purchasing products and information, and personal finance management, which are pertaining to the management of personal investments and finances with the use of online banking tools like HDFC net banking Dmat accounts etc.

B2C e-commerce reduces transactions costs (particularly search costs) by increasing consumer access to information and allowing consumers to find the most competitive price for a product or service. B2C e-commerce also reduces market entry barriers since the cost of putting up and maintaining a Web site is much cheaper than installing a "brick-and-mortar" structure for a firm. In the case of information goods, B2C e-commerce is even more attractive because it saves firms from factoring in the additional cost of a physical distribution network. Moreover, for countries with a growing and robust Internet population, delivering information goods becomes increasingly feasible.

Directly interact with the customers is the main difference with other business model. As B2B it manages directly relationship with consumers, B2C supply chains normally deal with business that are related to the customer.

**Share of B2B and B2C E-Commerce in Total Global E-Commerce**

**(2000 and 2004)**

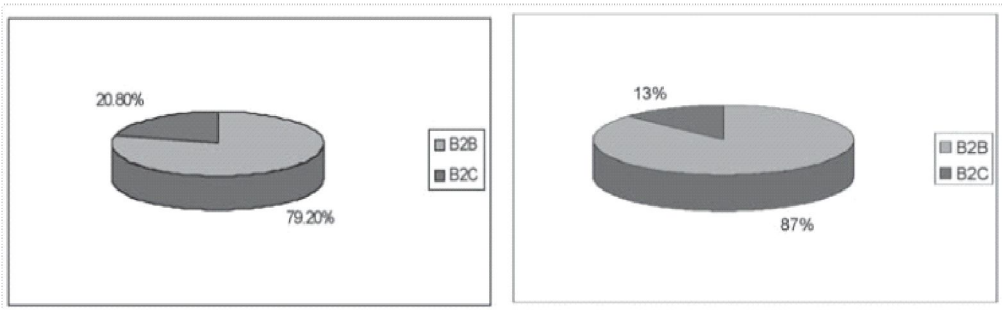


**Figure - 2.3**

### 2.4.2 Business to Business (B2B)

**Figure - 2.4**

B2B stands for Business to Business. It consists of largest form of Ecommerce. This model defines that Buyer and seller are two different entities. It is similar to manufacturer issuing goods to the retailer or wholesaler. Dell deals computers and other associated accessories online but it is does not make up all those products. So, in govern to deal those products, first step is to purchases them from unlike businesses i.e. the producers of those products.

"It is one of the cost effective way to sell out product throughout the world"

Benefits of B2B E-Commerce in Developing Markets:

- ***Transaction Costs***. There are three cost areas that are significantly reduced through the conduct of B2B e-commerce. First is the reduction of search costs, as buyers need not go through multiple intermediaries to search for information about suppliers, products and prices as in a traditional supply chain. In terms of effort, time and money spent, the Internet is a more efficient information channel than its traditional counterpart. In B2B markets, buyers and sellers are gathered together into a single online trading community, reducing search costs even further. Second is the reduction in the costs of processing transactions (e.g. invoices, purchase orders and payment schemes), as B2B allows for the automation of transaction processes and therefore, the quick implementation of the same compared to other channels (such as the telephone and fax). Efficiency in trading processes and transactions is also enhanced through the B2B e-market's ability to process sales through online auctions. Third, online processing improves inventory management and logistics.
- ***Disintermediation***. Through B2B e-markets, suppliers are able to interact and transact directly with buyers, thereby eliminating intermediaries and distributors. However, new forms of intermediaries are emerging. For instance, e-markets themselves can be considered as intermediaries because they come between suppliers and customers in the supply chain.
- ***Transparency in Pricing.*** Among the more evident benefits of e-markets is the increase in price transparency. The gathering of a large number of buyers and sellers in a single e-market reveals market price information and transaction processing to participants. The Internet allows for the publication of information on a single purchase or transaction, making the information readily accessible and available to all members of the e-market. Increased price transparency has the effect of pulling down price differentials in the market. In this context, buyers are provided much more time to compare prices and make better buying decisions. Moreover, B2B e-markets expand borders for dynamic and negotiated pricing wherein multiple buyers and sellers collectively participate in price-setting and two-way auctions. In such environments, prices can be set through automatic matching of bids and offers. In the e-marketplace, the requirements of both buyers and sellers are thus aggregated to reach competitive prices, which are lower than those resulting from individual actions.
- ***Economies of Scale and Network Effects***. The rapid growth of B2B e-markets creates traditional supply-side cost-based economies of scale. Furthermore, the bringing together of a significant number of buyers and sellers provides the demand-side economies of scale or network effects. Each additional incremental participant in the e-market creates value for all participants in the demand side. More participants form a critical mass, which is key in attracting more users to an e-market

### 2.4.3 Consumer to Consumer (C2C)

C2C stands for Consumer to Consumer. It helps the online dealing of goods or services among people. Though there is no major parties needed but the parties will not fulfill the transactions without the program which is supplied by the online market dealer such as eBay, olx.com where existing consumers put their

products up for sale to other consumers.

This type of e-commerce comes in at least three forms:

Ï% Auctions facilitated at a portal, such as eBay, which allows online real-time bidding on items being sold in the Web;

Ï% Classified ads at portal sites such as olx.com, 99acres.com (an interactive, online marketplace where buyers and sellers can negotiate and which features "Buyer Leads & Want Ads").

Ï% Peer-to-peer systems, such as the Torrentz.eu model (a protocol for sharing files between users used by chat forums similar to IRC) and other file exchange and later money exchange models.

www.ebay.in is prominent example of C2C e-commerce model.


**Figure - 2.5**

### 2.4.4 Peer to Peer (P2P)

It is a discipline that deal itself which assists people to instantly shares related computer files and computer sources without having to interact with central web server. If you are going to implement this model, both sides demand to install the expected software so that they could able to convey on the mutual platform. This kind of e-commerce has very low revenue propagation as from the starting it has been tended to the release of use due to which it sometimes caught involved in cyber laws.

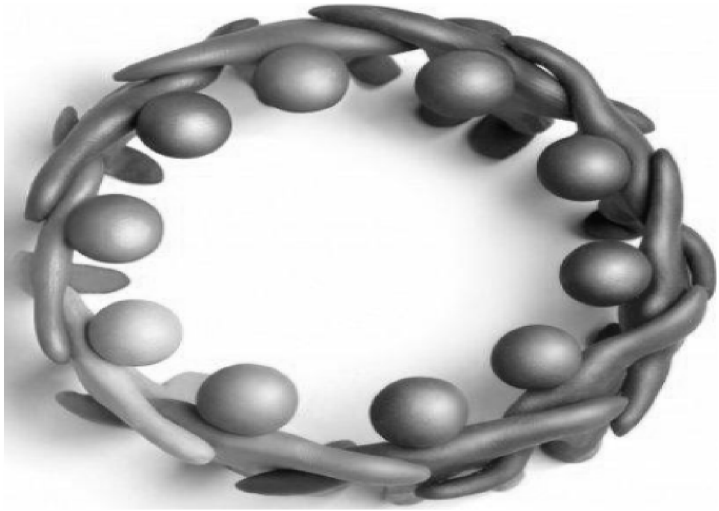

**Figure - 2.6**

### 2.4.5 M-Commerce


**Figure - 2.7**

It deals with conducting the transactions with the help of mobile. The mobile device consumers can interact with each other and can lead the business. Mobile Commerce involves the change of ownership or rights to utilize goods and related services. Following are the examples of m-commerce:-

- Money Mobile transfer.
- Money ATM.
- Mobile ticketing.
- Location based services.
- Information Services

As content delivery over wireless devices becomes faster, more secure, and scalable, some believe that m-commerce will surpass wire line e-commerce as the method of choice for digital commerce transactions. This may well be true for the Asian region where there are more mobile phone users than there are Internet users.

Industries affected by m-commerce include:

- ***Financial services***, including 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 conducted from the same handheld device);
- ***Telecommunications***, in which service changes, bill payment and account reviews can all be conducted from the same handheld device;
- ***Service/retail***, as consumers are given the ability to place and pay for orders on-the-fly; and
- ***Information services***, which include the delivery of entertainment, financial news, sports figures and traffic updates to a single mobile device.

**Activity B:**

1. Prepare a list of various organizations involved in B2B, B2C, P2P, C2C models of e- commerce. And find the prominent sectors to which they belong.

## 2.5 Special Features of E-commerce

The unique features of e-commerce technology include:

- **Ubiquity:** It is available just about everywhere and at all times.
- **Global Reach:** the potential market size is roughly equal to the size of the online population of the world.
- **Universal standards:** The technical standards of the Internet, and therefore of conducting e-commerce, are shared by all of the nations in the world.
- **Richness:** Information that is complex and content rich can be delivered without sacrificing reach.
- **Interactivity:** E-commerce technologies allow two-way communication between the merchant and the consumer.
- **Information Density:** The total amount and quality of information available to all market participants is vastly increased and is cheaper to deliver.
- **Personalization/Customization:** E-commerce technologies enable merchants to target their marketing messages to a person's name, interests, and past purchases. They allow a merchant to change the product or service to suit the purchasing behavior and preferences of a consumer.
- **Social Technology:** User content generation and social networking technologies are used to enhance the reach of e-commerce. Social websites like facebook, google+, twitter are consistently used by the marketer to promote their products online.

**Activity C:**

1. Prepare the list of social networking websites and also the marketers that are promoting their products on them.

## 2.6 Channels of E-commerce

Since e-commerce has grown in importance as companies have adopted *Pure-Click* and *Brick and Click* channel systems. We can differentiate between pure-click and brick and click channel system adopted by companies.

- ***Pure-Click Companies*** are those companies that have launched a website without any earlier existence as a firm. It is very important that such companies must set up and run their e-commerce websites very cautiously. Customer service is of supreme importance. There are quite a few examples of pure-click companies. Search engines, Internet Service Providers (ISPs), commerce sites, transaction sites, content sites, and enabler sites. Search engines and portals such as Yahoo! And Alta Vista started their business as search engines and later added services such as news, weather, stock reports, entertainments, and store fronts hoping to become the user's point of entry on the Internet. ISPs such as AOL and CompuServe provide Internet and e-mail connections for a fee. Commerce sites sell books, music, toys, insurance, stocks, clothes, financial services, and so on. Pure click companies are companies, which have their business segments only in online markets. The most prominent companies are ebay and Amazon. These companies have ONLY an online model and no offline model. Ebay does not sell products offline and neither does Amazon. Following picture shows few pure click companies. The major advantages of the pure click companies are

that they have low barriers to entry into the Web e-tail market and that they do not bear the costs associated with building and maintaining physical stores. The disadvantages are that they must build a brand name from scratch, quickly, and become profitable with no prior brand name or experience, which can be very difficult.


**Figure - 2.8**

- ***Brick and Click Companies*** are those existing companies that have added an online site for e-commerce. A company with a physical presence in the real world as well as online. Example of brick and click companies are retail book sellers with a physical store and a website from which one may order books. A brick and click company attempts to combine the flexibility of a purely online company with the personal service available from a brick and mortar company. Initially, Brick and Click companies were skeptical whether or not to add an online e-commerce channel for fear that selling their products might produce channel conflict with their off-line retailers, agents, or their own stores. However, they eventually added internet to their distribution channel portfolio after seeing how much business their online competitors were generating. A popular example of the bricks and clicks model is when a chain of stores allows the customer to order products either online or physically in one of their stores, also allowing them to either pick-up their order directly at a local branch of the store or get it delivered to their home. There are many alternative combinations of this model. The major advantages of the bricks-and-clicks operations are that they have an already established brand name, an established customer base, an established sales force, and the resources to operate on the very thin margins associated with the retail industry.


**Figure - 2.9**

**Activity D:**

1. Select a pure e-commerce company and analyze its product/service, process and delivery agent, explaining the implications of having digitized each aspect. Can this company continue to exist in the long term?

## 2.7 Business models of e-commerce

**Need of E-commerce**

The need for e-commerce curtailed from the demand within businesses and government to make enhanced use of computing and applying computer technology to improve customer communication, business processes, and information exchange both inside an enterprise. Thus, e-commerce provides the infrastructure and environment that enables and facilitates e-business. Within this, the implementation of e-business is solely dependent on whether there is a demand by the organization. And whether it can be supplied within the organization. Demand is created largely by the need to cut costs, improve efficiency, maintain

## 2.8 Disadvantages of E-commerce

To make a fair evaluation of e-commerce, we cannot stop at discussing the advantages that have been offered by e-commerce. Let us also look at the other side of the coin too there are some major issues that have been faced by the e-commerce organizations. Following are some disadvantages that have been observed:-

- ***Security Issues:-*** All business organization wants high security level for their commercial transaction so incase of online business its became a continue difficulty, which faces by customers as well.
- ***Overall System and Data Integration:-*** To protect our data and maintain integrity of our overall system is very crucial portion. Computer virus create many problems like unnecessary delays, storage problems, file backups and much other such type of problems which creates stress and increase complexity to handle the data.
- ***E-commerce is Paid*: -** E-commerce have forced large business with high charges and deep funding. Small retailers that are facing a problem to afford it.
- ***Play as a Perfect Market*:-** Electronic market place play like a perfect market where worldwide large numbers of buyers and sellers without mediators…….
- ***Commercial Susceptibility*:-** In competitive era it's easy to access all the information like products range, its detail, catalogs and other information about a business through its website makes it susceptible.
- ***Internet Hold High Level of Risk of Start Up*:-**There are lots of stories spread-out in 1999 about flourishing executives in established commercial houses leaving for Internet start–ups, only to find out that their get–prosperous dream with the help of dot.com was just that – a dream.
- ***Ecommerce Lacks That Personal Touch*:** Not that all physical retailers have a personal approach, but we do know of several retailers who value human relationships. As a result, shopping at those retail outlets is reassuring and refreshing. Clicking on "Buy now," and piling up products in virtual shopping carts, is just not the same for us. Different people sing to different tunes. The demise of the personal touch in online transactions is the biggest disadvantage of ecommerce.

- ***Ecommerce Delays Goods:*** e-commerce websites cannot provide physical products readily available. There is exceptions in case of digital products they can be readily delivered/downloaded at access point. For example downloading itunes, watching movies on DTH.
- ***Ecommerce Does Not Allow You to Experience the Product Before Purchase*:** In many cases, customers want to experience the product before purchase. Ecommerce does not allow that. If you buy a music system, you cannot play it online to check if it sounds right? If you are purchasing a home-theatre system, you would much rather sit in the "experience center" that several retail stores set up. You cannot touch the fabric of the garment you want to buy. You cannot check how the shoe feels on your feet. You cannot "test" the perfume that you want to buy.

**Activity E:**

1. find out the frauds that are prevalent in the field of e-commerce and also find out methods through which a consumer can safeguard himself from being a victim of such frauds.

## 2.9 Summary

· E- Environment consists of all the external environmental forces which affect e-commerce from outside.

· There are two channels of e-commerce (i) Pure Click Companies, (ii), Click and Brick Companies.

· The e-commerce is significant as it reduced the cost of back office processing in organization.

· In e-commerce one cannot taste or try product before purchasing.

## 2.10 Self Assessment Questions

1. What is the difference between e-commerce and e-business?
2. Briefly elaborate the needs of e-commerce.
3. Which industry stands to benefit most from e-commerce?
4. Which activities are least likely to be affected by e-commerce?
5. What are the major disadvantages of e-commerce?
6. Explain in brief the models adopted by e-commerce organizations?
7. How e-environment can help to business organizations for a tremendous growth in their regular business performances?
8. Elaborate the e-commerce importance.
9. How e-commerce and e-businesses are inter-related?
10. What are salient features or supportive factors of e-commerce?
11. Write different models of e-commerce. Which is most important one? Give supportive reasons for your answers.
12. Explains some shortcoming of adopting e-commerce.

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# Unit - 3 : Client Server Architecture of E-Commerce

**Structure of Unit:**



## 3.0 Objective

By using this tutorial, you will learn about Client Server Architecture and you will be able to understand the client-server characteristics, the difference between Client Server Computer and Peer to Peer Computing or architecture, their merits and demerits. You will also begin to understand ORB and different dynamics of Client Server Models.

## 3.1 Introduction

The client/server model is a computing model that acts as a distributed application which partitions tasks or workloads between the providers of a resource or service, called servers, and service requesters, called clients.

Often clients and servers communicate over a computer network on separate hardware, but both client and server may reside in the same system. A server machine is a host that is running one or more server programs which share their resources with clients. A client does not share any of its resources, but requests a server's content or service function. Clients therefore initiate communication sessions with servers which await incoming requests.

Client/server computing is the most effective source for the tools that empower employees with authority and responsibility. Workstation power, workgroup empowerment, preservation of existing investments, remote network management, and market-driven business are the forces creating the need for client/server computing.

Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request. Although the client/server idea can be used by programs within a single computer, it is a more important idea in a network.

In a network, the client/server model provides a convenient way to interconnect programs that are distributed efficiently across different locations. Computer transactions using the client/server model are very common.

For example, to check your bank account from your computer, a client program in your computer forwards your request to a server program at the bank. That program may in turn forward the request to its own client program that sends a request to a database server at another bank computer to retrieve your account balance. The balance is returned back to the bank data client, which in turn serves it back to the client in your personal computer, which displays the information for you.

The client/server model has become one of the central ideas of network computing. Most business applications being written today use the client/server model. So does the Internet's main program, TCP/IP. In marketing, the term has been used to distinguish distributed computing by smaller dispersed computers from the "monolithic" centralized computing of mainframe computers. But this distinction has largely disappeared as mainframes and their applications have also turned to the client/server model and become part of network computing.

A client computer and a server computer are usually two separate devices, each customized for their designed purpose. For example, a Web client works best with a large screen display, while a Web server does not need any display at all and can be located anywhere in the world. However, in some cases a given device can function both as a client and a server for the same application. Likewise, a device that is a server for one application can simultaneously act as a client to other servers, for different applications.

## 3.2 Key Definitions

These words are used often in client server architecture so you will want to become familiar with them before using the program and this tutorial.

**Client :** A client is a single-user workstation that provides presentation services and the appropriate computing, connectivity and the database services and the interfaces relevant to the business need. Typically, a client is an application that runs on a personal computer or workstation and relies on a server to perform some operations. For example, an e-mail client is an application that enables you to send and receive e-mail.

**Server:** A server is one or more multi-user processors with share memory providing computing, connectivity and the database services and the interfaces relevant to the business need. A client computer provides the user interaction-facility (interface) and some or all application processing, while a server computer might provide high-volume storage capacity, heavy data crunching, and/or high resolution graphics.

Typically, several client computers are connected through a network (or networks) to a server which could be a large PC, minicomputer, or a mainframe computer. Every computer connected to a website acts as a client while the website's computer acts as a server which is also called client-server environment.

**Client-Server Architecture: -** A network architecture in which each computer or process on the network is either a client or a server. Servers are powerful computers or processes dedicated to managing disk drives (file servers), printers (print servers), or network traffic (network servers). Clients are PCs or workstations on which users run applications. Clients rely on servers for resources, such as files, devices, and even processing power.

Another type of network architecture is known as a peer-to-peer architecture because each node has equivalent responsibilities. Both client/server and peer-to-peer architectures are widely used, and each has unique advantages and disadvantages.

## 3.3 What are Clients and Servers?

Client/server networking grew in popularity many years ago as personal computers (PCs) became the common alternative to older mainframe computers. Client devices are typically PCs with network software applications installed that request and receive information over the network. Mobile devices as well as desktop computers can both function as clients.

A client is a computer that allows a user or users to log on to the network and take advantage of the resources available on the network. A client computer will make a client operating system. The purpose of the client is to get user onto the network; therefore, client computers don't usually have the processing power, the storage space, or the memory found on a server because the client does not have to serve up resources to other computers on the network.

A server, on the other hand, is typically a much more powerful computer that runs a network operating system. The server provides centralized administration of the network and serves up the resources that are available on the network, such as printers and files. The administrator of the server decides who can and cannot log on the network and which resources the various can access. A server device typically stores files and databases including more complex applications like Web sites. Server devices often feature higher-powered central processors, more memory, and larger disk drives than clients. The next figure describes a typical client server methodology in current practice.

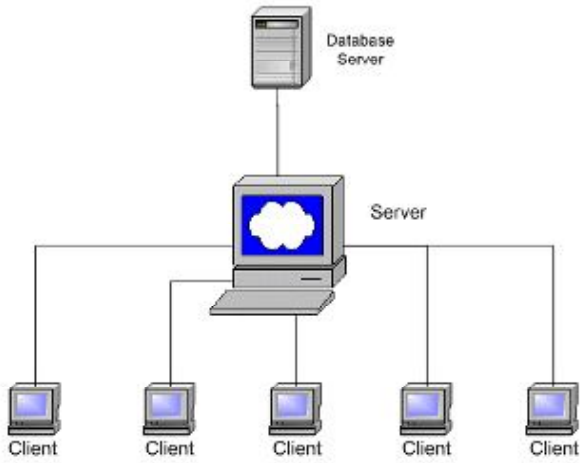


**Figure – 3.1 : Illustrative Client-Server Scenario**

## 3.4 What is Client Server Architecture?

In Computer science client-server is a software architecture model consisting of two parts, client systems and server systems, both communicate over a computer network or on the same computer. A client-server application is a distributed system consisting of both client and server software. The client process always initiates a connection to the server, while the server process always waits for requests from any client. When both the client process and server process are running on the same computer, this is called a single seat setup.

Another type of related software architecture is known as peer-to-peer, because each host or application instance can simultaneously act as both a client and a server (unlike centralized servers of the client-server model) and because each has equivalent responsibilities and status. Peer-to-peer architectures are often abbreviated using the acronym P2P.

The client-server relationship describes the relation between the clients and how it makes a service request from the server, and how the server can accept these requests, process them, and return the requested information to the client. The interaction between client and server is often described using sequence diagrams. Sequence diagrams are standardized in the Unified Modeling Language. Both client-server and P2P architectures are in wide usage today.

The basic type of client-server architecture employs only two types of hosts: clients and servers. This type of architecture is sometimes referred to as two-tier. The two-tier architecture means that the client acts as one tier and server process acts as the other tier.

The client-server architecture has become one of the basic models of network computing. Many types of applications have being written using the client-server model. Standard networked functions such as E-mail exchange, web access and database access, are based on the client-server model. For example, a web browser is a client program at the user computer that may access information at any web server in the world.

This computing model is especially effective when clients and the server each have distinct tasks that they routinely perform. In hospital data processing, for example, a client computer can be running an application program for entering patient information while the server computer is running another program that manages the database in which the information is permanently stored. Many clients can access the server's information simultaneously, and, at the same time, a client computer can perform other tasks, such as sending e-mail. Because both client and server computers are considered intelligent devices, the client-server model is completely different from the old "mainframe" model, which utilized a centralized mainframe computer that performed all the tasks for its associated "dumb" terminals.

## 3.5 Characteristics of Client Server Architecture

The clients and the servers are the logical entities that work together over a network to accomplish a task. The distinguishing characteristics of the Client/Server systems are:

1. **Service:** The client/server is primarily a relationship between processes running on separate machines. The server process is a provider of services. The client is a consumer of services. In essence, client/server provides a clean separation of function based on the idea of service.

2. **Shared Resources:** A server can service many clients at the same time and regulate their access to shared resources.

3. **Asymmetrical Protocols:** There is a many-to-one relationship between the clients and the server. Clients always initiate the dialog by requesting a service. Servers are passively awaiting request from the clients. In some cases a client may pass a reference to a callback object when it invokes a service. This lets the server call back the client. So the client becomes a server.

4. **Transparency of Location:** The server is a process that can reside on the same machine as the client or on a different machine across a network. Client/Server software usually masks the location of the server from the clients by the redirecting the service calls when needed. A program can be a client, a server, or both.

5. **Mix-and-match:** The ideal client/server software is independent of hardware or operating system software platforms. You should be able to mix-and-match client and server platforms.

6. **Message-based Exchanges:** Clients and servers are loosely coupled systems that interact through a message-passing mechanism. The message is the delivery mechanism for the service request and replies.

7. **Encapsulation of Services:** The server is a specialist. A message tells a server is requested; it is then up to the server to determine how to get the job done. Servers can be upgraded without affecting the clients as long as the published message interface is not changed.

8. **Scalability:** Client/Server systems can be scaled horizontally or vertically. Horizontal scaling means adding or removing client workstations with only a slight performance impact. Vertical scaling means either migrating to a larger and faster server machine or distributing the processing load across multiple servers.

9. **Integrity:** The server code and server data is centrally managed, which results in cheaper maintenance and the guarding of shared data integrity. At the same time, the clients remain personal and independent.

## 3.6 Evaluating Client Server Architecture

Client-server architecture can be considered as a network environment that exchanges information between a server machine and a client machine where server has some resources that can be shared by different clients. In a Client/server architecture individual computers (known as clients) are connected to a central computer which is known as servers.

Let's take an example of a file server to understand the core process of a client/server network, the file server acts as a storage space on the network for the files, spreadsheets, databases, etc. Instead of storing these records on every individual computer, the file server allows the clients to store their files on one central computer and make them sharable. The client-server architecture is beneficial in reducing the multiple iterations of a single file and allowing the organization to have one centralized point for every computer to access the same file.

A client/server network involves multiple clients connecting to a single, central server. The file server on a client/server network must have robust hardware configurations to handle large volumes of client service requests. Hence servers usually are high speed computers with large hard disk capacity.

By contrast, peer-to-peer networks involve two or more computers pooling individual resources such as disk drives, CD-ROMs and printers. These shared resources are available to every computer in the network, while each of them communicates in a session. Each computer acts as both the client and the server which means all the computers on the network are equals, that is where the term peer-to-peer comes from.

The advantage of peer-to-peer networking is the easier control concept not requiring any additional coordination entity and not delaying transfers by routing via server entities. However, the collision of session may be larger than with routing via server nodes.

But peer-to-peer networks are typically less secure than client/server networks because security is handled by the individual computers, not controlled and supervised on the network as a whole. The resources of the computers in the network can become congested as they have to support not only the workstation user, but also the requests from network users.

It may be difficult to provide system wide services when the client operating system typically used in this type of network is incapable of hosting the service.

Though the Client/server networks with their additional capacities have a higher initial setup cost for networking than peer to peer networks but the long-term aspect of administering a client/server network with applications largely server-hosted surely saves administering effort compared to administering the application settings per each client.

### 3.6.1 Advantages of Client Server Model

Client/server computing provides the capability to use the most cost-effective user interface, data storage, connectivity, and application services. Frequently, client/server products are deployed within the present organization but are not used effectively.

The client/server model provides the technological means to use previous investments in concert with current technology options. Organizations see opportunities to use technology to provide business solutions. Service and quality competition in the marketplace further increases the need to take advantage of the benefits available from applications built on the client/server model.

Client/server computing in its best implementations moves the data-capture and information-processing functions directly to the knowledgeable worker—that is, the worker with the ability to respond to errors in the data, and the worker with the ability to use the information made available.

1. **Superior Data Sharing:** Data that is collected as part of the normal business process and maintained on a server is immediately available to all authorized users. The use of Structured Query Language (SQL) to define and manipulate the data provides support for open access from all client processors and software.

   SQL grants all authorized users access to the information through a view that is consistent with their business need. Transparent network services ensure that the same data is available with the same currency to all designated users.

2. **Integrated Services:** In the client/server model, all information that the client is entitled to use is available at the desktop. There is no need to change into terminal mode or log into another processor to access information. All authorized information and processes are directly available from the desktop interface. The desktop tools—e-mail, spreadsheet, presentation graphics, and word processing are available and can be used to deal with information provided by application and database server's resident on the network.

   Desktop users can use their desktop tools in conjunction with information made available from the corporate systems to produce new and useful information.

3. **Sharing Resources among Diverse Platforms:** The client/server computing model provides opportunities to achieve true open system computing. Applications may be created and implemented without regard to the hardware platforms or the technical characteristics of the software.

   Thus, users may obtain client services and transparent access to the services provided by database, communications, and applications servers. Operating systems software and platform hardware are independent of the application and masked by the development tools used to build the application. In this approach, business applications are developed to deal with business processes invoked by the existence of a user-created "event."

4. **Data Interchangeability and Interoperability:** SQL is an industry-standard data definition and access language. This standard definition has enabled many vendors to develop production-class database engines to manage data as SQL tables. Almost all the development tools used for client/server development expect to reference a back-end database server accessed through SQL.

Network services provide transparent connectivity between the client and local or remote servers. With some database products, such as Ingres Star, a user or application can define a consolidated view of data that is actually distributed between heterogeneous, multiple platforms.

Systems developers are finally reaching the point at which this heterogeneity will be a feature of all production-class database engine products. Most systems that have been implemented to date use a single target platform for data maintenance. The ability to do high-volume updates at multiple locations and maintain database integrity across all types of errors is just becoming available with production-level quality performance and recovery.

Systems developed today that use SQL are inherently transparent to data storage location and the technology of the data storage platform. The SQL syntax does not specify a location or platform.

This transparency enables tables to be moved to other platforms and locations without affecting the application code. This feature is especially valuable when adopting proven, new technology or if it makes business sense to move data closer to its owner.

5. **Location Independence of Data and Processing:** We are moving from the machine-centered computing era of the 1970s and 1980s to a new era in which PC-familiar users demand systems that are user centered. Previously, a user logged into a mainframe, mini or micro application. The syntax of access was unique in each platform. Function keys, error messages, navigation methods, security, performance, and editing were all very visible. Today's users expect a standard "look and feel." Users log into an application from the desktop with no concern for the location or technology of the processors involved. Besides these, in most cases, client-server architecture enables the roles and responsibilities of a computing system to be distributed among several independent computers that are known to each other only through a network. This creates an additional advantage to this architecture: greater ease of maintenance. For example, it is possible to replace, repair, upgrade, or even relocate a server while its clients remain both unaware and unaffected by that change. This independence from change is also referred to as encapsulation.

   Also all the data is stored on the servers, which generally have far greater security controls than most clients. Servers can better control access and resources, to guarantee that only those clients with the appropriate permissions may access and change data. Since data storage is centralized, updates to that data are far easier to administer than what would be possible 8. Many mature client-server technologies are already available which were designed to ensure security, 'friendliness' of the user interface, and ease of use. It functions with multiple different clients of different capabilities.

### 3.6.2 Disadvantages of Client Server Model

1. **Expensive:** Typically, the central server computer must be powerful enough to maintain and share resources with the other computers on the network. This entails a substantial cost.

2. **Dependence:** The client-server network model relies on a functioning and available centralized server. If the centralized server is removed from the system or goes down due to problems, the entire network cannot function. However, many client server networks now have backup servers to provide support when a server is lost.

3. **Congestion:** Centralized servers must handle the majority of the network traffic, as all queries for resources are directed toward the server. This can cause network congestion on the network and slow down response times for each computer available. Traffic congestion on the network has been an issue. As the number of simultaneous client requests to a given server increases, the server can

become severely overloaded. Contrast that to a P2P network, where its bandwidth actually increases as more nodes are added, since the P2P network's overall bandwidth can be roughly computed as the sum of the bandwidths of every node in that network.

4. **Maintenance:** Client-server networks often require a staff with at least a single network administrator to manage and maintain the equipment and the network. Other network operating systems, such as peer-to-peer network systems, do not require a network administrator to maintain machines, as this work is distributed among individual clients and their related machines.

5. **Lack of Robustness:** The client-server paradigm lacks the robustness of a good P2P network. Under client-server, should a critical server fail, clients' requests cannot be fulfilled. In P2P networks, resources are usually distributed among many nodes. Even if one or more nodes depart and abandon a downloading file, for example, the remaining nodes should still have the data needed to complete the download. The server is the only weak link in the client/server network, given that the entire network is built around it and any failure in hardware severely impacts all clients with one go and this is one of the hurdle of client server architecture.

## 3.7 Types of Servers

The term server is used quite broadly in information technology. Despite the many server-branded products available (such as server versions of hardware, software or operating systems), in theory any computerized process that shares a resource to one or more client processes is a server.

In the client–server configuration one or more machines, either a computer or a computer appliance, share information with each other with one acting as a host for the other. A dedicated server will contain features making it more suitable for production environments. These features may include a faster CPU, increased high-performance RAM, and increased storage capacity in the form of a larger or multiple hard drives. Servers also typically have reliability, availability and serviceability (RAS) and fault tolerance features, such as redundancy in power supplies, storage (as in RAID), and network connections.

Hardware requirements for servers vary, depending on the server application. Absolute CPU speed is not usually as critical to a server as it is to a desktop machine. Servers' duties to provide service to many users over a network lead to different requirements such as fast network connections and high I/O throughput.

Since servers are usually accessed over a network, they may run in headless mode without a monitor or input device. Processes that are not needed for the server's function are not used. Many servers do not have a graphical user interface (GUI) as it is unnecessary and consumes resources that could be allocated elsewhere.

Similarly, audio and USB interfaces may be omitted. Servers often run for long periods without interruption and availability must often be very high, making hardware reliability and durability extremely important. Although servers can be built from commodity computer parts, mission-critical enterprise servers are ideally very fault tolerant and use specialized hardware with low failure rates in order to maximize uptime, for even a short-term failure can cost more than purchasing and installing the system.

Servers can be classified on the basis of their usages. The typical classification is as follows:

1. **File Server:** - File Servers are useful for sharing information across the network .The client passes a request for file records over a network to the file server. This is the most primitive type of data service used for exchanging messages over the network to find the requested data. The file servers

provide access to the remote server processors. In the typical implementation the software, shared data, databases and backups are stored on disk, tape and optical storage devices that are managed by the file server.

2. **Data base Servers**:- in Database Server The client passes the SQL requests as messages to the database server; the result of each SQL command is returned over the network. The code, which processes the SQL request and the data, reside in the same machine, the server uses its own processing power to find the requested data back to the client, instead of passing all the records back to the client. This results in a much more efficient use of the distributed processing power. Note that the application code resides on the client; thus you must either write code for the client or you can buy a shrink-wrap query tool. The database servers provide the foundation for decision-support systems and also provide key role in data warehousing.

3. **Transaction Servers**:- in this the client can invoke remote procedure or services that reside on the server with an SQL database engine using the transaction server. The network exchange consists of a single request/ reply. The SQL statements either all succeeded or fail as a unit. These grouped SQL statements are called transactions. With a transaction server you create the client/server application by writing the code for both the client and the server components. The client component usually includes a Graphical User Interface (GUI). The server component consists of SQL transaction against a database. These applications are called Online Transaction Processing or OLTP. The OLTP are mission-critical applications that require a very less response time (1-3 sec). The OLTP applications also require tight controls over the security and integrity of the database.

4. **Groupware Servers**: - It involves the management of semi-structured information such as text, image, mail, bulletin boards and the flow of work. These client/server system places people in direct contact with other people. Best examples are Lotus Notes and Microsoft Exchange. Specialized groupware software can be built on top of a vendor's canned set of client/server API's. In many cases, applications are created using a scripting language and form-based interfaces provided by the vendor. Now many groupware products use e-mail as their standard messaging middleware. Also, Internet is quickly becoming the middleware platform of choice for groupware.

5. **Object Application Servers**: - The client/server application is written as a set of communicating objects with an object server. The client object uses the Object Request Broker (ORB) to communicate with the server objects. The ORB locates an instance of that object server class, invokes the requested method and returns the results to the client object. The server objects must support the concurrency and sharing aspects. The ORB and a new generation of CORBA *i.e. Common Object Request Broker Architecture* application servers bring it all together.

## 3.8 ORB

In distributed computing, an object request broker (ORB) is a piece of middleware software that allows programmers to make program calls from one computer to another via a network (so-called remote procedure calls). ORBs promote interoperability of distributed object systems because they enable users to build systems by piecing together objects from different vendors, so that they communicate with each other via the ORB.

ORBs handle the transformation of in-process data structures to and from the byte sequence, which is transmitted over the network. This is called marshaling or serialization. Some ORBs, such as CORBA (Common Object Request Broker Architecture) compliant systems, use an Interface Description Language

(IDL) to describe the data that is to be transmitted on remote calls. In addition to marshaling data, ORBs often expose many more features, such as distributed transactions, directory services or real-time scheduling.

In object-oriented languages, the ORB takes the form of an object with methods enabling connection to the objects being served. After an object connects to the ORB, the methods of that object become accessible for remote invocations. The ORB requires some means of obtaining the network address of the object that has now become remote. The typical ORB also has many other methods.

An ORB is much more sophisticated than alternative forms of client/server middleware including the traditional Remote Procedure Calls (RPC's), Message-Oriented Middleware (MOM), database stored procedures, and peer-to-peer services. ORBs promote interoperability of distributed object systems because they enable users to build systems by piecing together objects- from different vendors- that communicate with each other via the ORB

In other words an ORB is a middleware technology that manages communication and data exchange between objects. ORB is the object bus. It lets the objects transparently make request to and receive responses from other objects located locally or remotely. The client is not aware of the mechanisms used to communicate with, activate or store the server objects so neither the objects, the programmers who create them, nor the end users who use them need to know anything about the other objects in the network because the ORB is designed to handle the interactions.

Specifically, ORBs:

- Abstractly define an application's interfaces so that other applications can use them.
- Discover applications and the associated interfaces elsewhere in a network.
- Allow applications to message and respond to one another.

An illustrative diagram of the CORBA-ORB is as follows

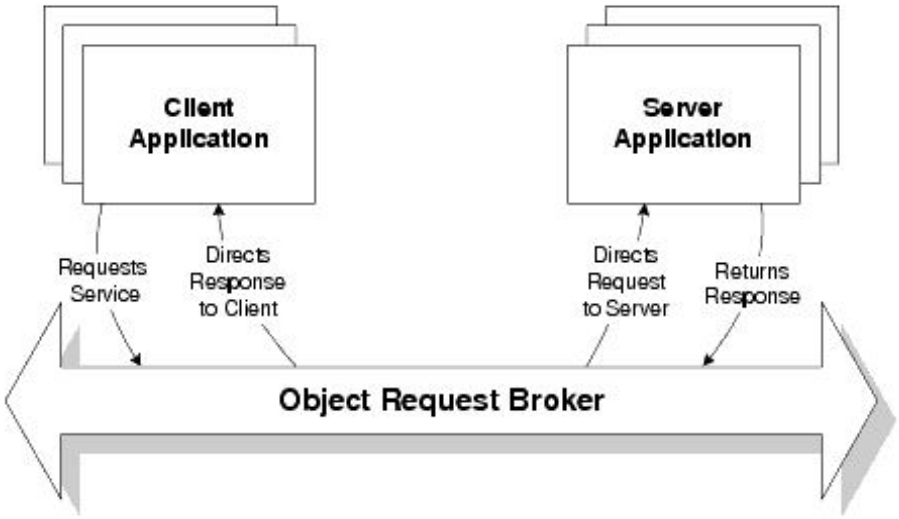


**Figure - 3.2 : Illustrative Diagram of ORB**

The ORB must support many functions in order to operate consistently and effectively, but many of these functions are hidden from the user of the ORB. Some of the functions of ORB are as follows

1. **Providing Illusion of Locality:** It is the responsibility of the ORB to provide the illusion of locality, in other words, to make it appear as if the object is local to the client, while in reality it may reside in a different process or Machine. Thus the ORB provides a framework for cross-system

communication between objects. This is the first technical step toward interoperability of object systems.

2. **Hide the Implementation Details:** The next technical step toward object system interoperability is the communication of objects across platforms. An ORB allows objects to hide their implementation details from clients. This can include programming language, operating system, host hardware, and object location. Each of these can be thought of as a "transparency," and different ORB technologies may choose to support different transparencies, thus extending the benefits of object orientation across platforms and communication channels.

There are many ways of implementing the basic ORB concept; for example, ORB functions can be compiled into clients, can be separate processes, or can be part of an operating system kernel. These basic design decisions might be fixed in a single product; or there might be a range of choices left to the ORB implementer.

There are two major ORB technologies:

- The Object Management Group's (OMG) Common Object Request Broker Architecture (CORBA) specification
- Microsoft's Component Object Model (COM).

## 3.9 Client Server Architecture

We know that the client/server models can be distinguished by the service they provide and how the distributed application is split between the client and the server.

In these lines we have

1. **Fat Server Model**: This Model places more functions on the server and thus it usually used for the mission-critical applications. The applications are easier to manage on the network as most of the work is done on the server. In this model the fat servers create abstract level of services by which the network interchange is minimized.

   The Transaction Servers and the Object Server embed the concept of encapsulation of database by exporting the procedure/ methods, which act on the data instead of the raw data. And thus the client interacts with such fat servers using the remote procedure call. Some of the examples of this model are the Groupware, Transaction Servers, and Web Servers.

2. **Fat Client Model: -**This model places more function on the client. In this client/server architecture, a client performs the bulk of the data processing operations. The data itself is stored on the server. These are the traditional form of the client/server systems and generally used for decision support and personal software and often lead to the creation of the front-end tools and applications.

The best places to find this model are the file server and the database server models where the client knows how the data is organized and stored on the server. We must understand that in the actual working environment both fat server and the fat client may coexist in one application.

A network architecture in which each computer or process on the network is either a client or a server. Servers are powerful computers or processes dedicated to managing disk drives (file servers), printers (print servers), or network traffic (network servers). Clients are PCs or workstations on which users run applications. Clients rely on servers for resources, such as files, devices, and even processing power.

Another type of network architecture is known as a peer-to-peer architecture because each node has equivalent responsibilities. Both client/server and peer-to-peer architectures are widely used, and each has unique advantages and disadvantages. Client-server architectures are sometimes called two-tier architectures.

The experts do not use the terms fat client and the fat servers on the contrary they refer to them are 2-tier, 3-tier and N-tier client/server architecture. This is the means by which they are functionally split. The functional units comprise of user interface, business logic and the shared data.

### 3.9.1. The 2-Tier Client/Server Architecture

Two tier software architectures were developed in the 1980s from the file server software architecture design. The two-tier architecture is intended to improve usability by supporting a forms-based, user-friendly interface.

The two-tier architecture improves scalability by accommodating up to 100 users (file server architectures only accommodate a dozen users). It also proves flexibility by allowing data to be shared, usually within a homogeneous environment. The two-tier architecture requires minimal operator intervention, and is frequently used in non-complex, non-time critical information processing systems.

Two tier architectures consist of three components distributed in two layers:

a) client (requester of services)

b) And server (provider of services).

The three components are

1. User System Interface (such as session, text input, dialog, and display management services)
2. Processing Management (such as process development, process enactment, process monitoring, and process resource services)
3. Database Management (such as data and file services)

The two-tier design allocates the user system interface exclusively to the client. It places database management on the server and splits the processing management between client and server, creating two layers. The application logic may be present at the client side within a user interface or it may be present within the database on the server or on the both. It is most popular because of its simplicity. These applications can be quickly built by using and visual builder tools; which can be used for developing applications for decision support system of small-scale groupware or you may build a simple web publishing applications.

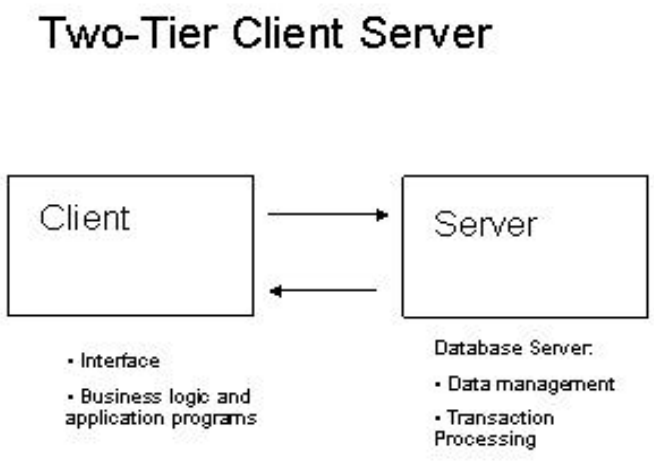


**Figure- 3.3 : Illustrative Diagram of the Two Tier Client Server Architecture**

The main disadvantage arises only when we deploy them beyond the departmental LAN. Typically the applications that worked perfectly well in prototypes and small installations failed for large-scale productions. It actually went through a transition phase, where it grew beyond the departmental LAN's. Thus slowly but steadily the industry adopted the 3-tier and the N-tier applications.

### 3.9.2. The 3-Tier Client/Server Architecture

The three-tier software architecture emerged in the 1990s to overcome the limitations of the two-tier architecture. The third tier (middle tier server) is between the user interface (client) and the data management (server) components.

This middle tier provides process management where business logic and rules are executed and can accommodate hundreds of users (as compared to only 100 users with the two tier architecture) by providing functions such as queuing, application execution, and database staging.

The three tier architecture is used when an effective distributed client/server design is needed that provides (when compared to the two tier) increased performance, flexibility, maintainability, reusability, and scalability, while hiding the complexity of distributed processing from the user. Moreover they are also easy to manage and deploy the network and most of the code runs on the server.

The 3-tier substitutes a few server calls for many SQL queries and updates so it performs much better than 2-tier. A three tier distributed client/server architecture includes a user system where user services (such as session, text input, dialog, and display management) reside. The third tier provides database management functionality and is dedicated to data and file services that can be optimized without using any proprietary database management system languages.

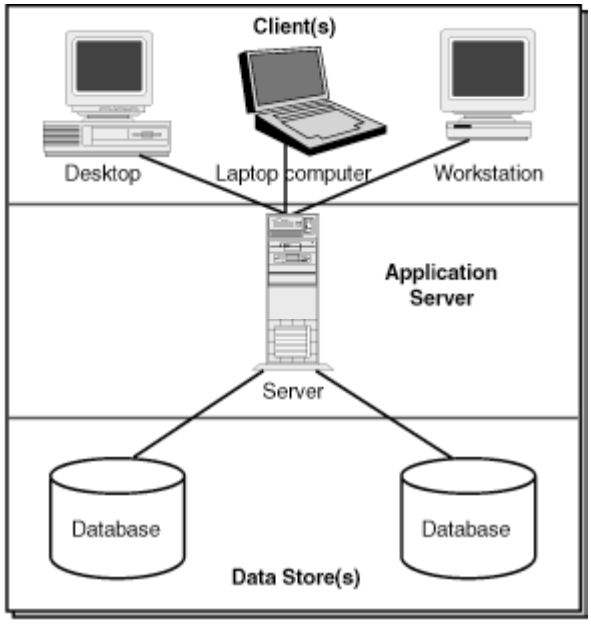


**Figure - 3.4 : Illustrative Diagram of the Three Tier Client Server Architecture**

### 3.9.3. The 3-Tier to N-Tier Client/Server Architecture

In the 3-tier applications, the middle tier is generally not a monolithic program but is implemented as a collection of components that are initiated by several client- initiated business transaction.

One component can call other components to help it implement a request; also some components may act as gateways which may encapsulate legacy applications running on mainframe. The component-based application provides the following advantages over the monolithic applications.

In n-tier architecture, there are 3 basic layers to any system design:

**Presentation Layer:** This layer should contain only your web servers that contain static content and basic page information, but defer to the middle tier for any actual Servlet or business logic activities to be performed. Users should only connect to servers that reside in this layer

**Business Logic Layer:** This is the middle tier that contains all of the business logic of an application. All Servlets and scripts that fetch, manipulate or store data should run in this layer. Only servers from the other two tiers should communicate with the servers in this layer.

**Data Layer:** All of your database applications and data storage repositories exist in this layer. Some business logic may exist in this layer as well, if it is dedicated to the operations of the database infrastructure. Only servers from the middle tier should communicate with servers in this layer. So you can technically run all three of these layers on a single server; however you lose many of the security advantages of running n-tier. Development of systems should be able to build a single server edition of their application that can be easily split to multiple servers when moving toward test and production environments.

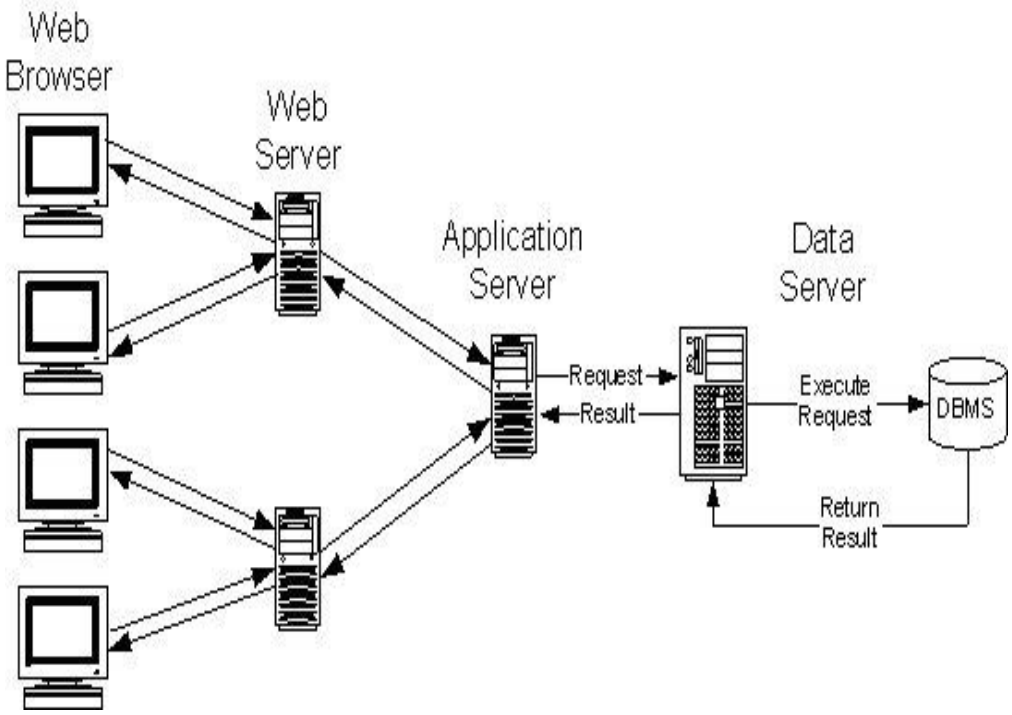


**Figure – 3.5 : Illustrative Diagram of the N Tier Client Server Architecture**

## 3.10 Client Side Services

The client in the client/server model is the desktop workstation. Any workstation that is used by a single user is a client, if multiple users share the same workstation simultaneously, then it is a server.

In client/server applications, functions are provided by a combination of resources using both the client workstation processor and the server processor. In the client/server model, the client is primarily a consumer of services provided by one or more server processors. Whereas the server acting a service provider responding to the client's request.

The client provides presentation services. The user input and final output are presentation at the client workstation. The current technology provides full support for GUI's. The functions like field edits, context sensitive help, navigation, training, personal data storage and manipulation frequently execute on the client workstation. All of them use the GUI and Windowing functionality.

A client workstation requests services form the attached server; whatever may be the type of processor the format of request is the same. It is the job if the NOS (Network Operating System) software to translate or add the necessary details as required by the targeted requester to the application request. NOS also provide the redirection service. This service intercepts client workstation operating system calls and redirects them to the server operating system.

Thus in this way the request for disk directories or disk files, printers, printer queues, serial devices, application programs and named pipes are trapped by the redirection software and redirected to the correct server location.

Some of the examples of the client side services are

- Print Services
- Remote Services
- Utility Services
- Message Services
- Network Services
- Application services

## 3.11 Server Side Services

Servers provide application, file, database, print, fax, image, communications, security, systems, and network management services. It is important to understand that a server is an architectural concept, not a physical implementation description. The same physical device can provide client and server functions.

Application servers provide business functionality to support the operation of the client workstation. In the client/server model these services can be provided for an entire or partial business function invoked through an Inter Process Communication (IPC) request for service. Either message based requests i.e. OLTP or RPCs can be used.

A collection of application servers may work in concert to provide an entire business function. For example, in a payroll system the employee information may be managed by one application server, earnings calculated by another application server, and deductions calculated by a third application server.

These servers may run different operating systems on various hardware platforms and may use different database servers. The client application invokes these services without consideration of the technology or geographic location of the various servers.

Some different Types of Servers are:

- The Database servers.
- The file server
- The Print servers
- The Fax servers provide
- The Communications servers.
- The UNIX Servers
- The VMS servers

A client issues requests to the NOS services software resident on the client machine. And after that these services format the request into an appropriate RPC and issue the request to the application layer of the client protocol stack and finally the application layer of the protocol stack on the server receives this request and perform the request task.

Some of the server side services are

**Data Base Services**: Client/server database engines such as Sybase, IBM's Database Manager, Ingres, Oracle, and Informix provide support at the server to execute SQL (Structured Query Language) requests issued from the client workstation. Relational database management systems are the current technology for data management.

Relational database technology provides the current data management solution to many of the problems inherent in the flat-file and hierarchical technologies. The primary design objective behind the query language was to provide a data access language that could make the task much easier for a new or inexpert user.

**Security Services**: Client/server applications require similar security services to those provided by host environments. Every user should be required to log in with a user ID and password. If passwords might become visible to unauthorized users, the security server should insist that passwords be changed regularly.

The enterprise on the desk implies that a single logon ID and logon sequence is used to gain the authority once to access all information and process for the user has a need and right of access. Because data may be stored in a less physically secure area, the option should exist to store data in an encrypted form. A combination of the user ID and password should be required to decrypt the data.

**File Services**: - File services handle access to the virtual directories and files located on the client workstation and to the server's permanent storage. These services are provided through the redirection software implemented as part of the client workstation operating environment.

The file services provide this support at the remote server processor. In the typical implementation, software, shared data, databases, and backups are stored on disk, tape, and optical storage devices that are managed by the file server. To minimize the effort and effect of installation and maintenance of software, software should be loaded from the server for execution on the client. New versions can be updated on the server and made immediately available to all users. In addition, installation in a central location reduces the effort required for each workstation user to handle the installation process. Because each client workstation user uses the same installation of the software, optional parameters are consistent, and remote help desk operators are aware of them. In addition the above, communication services are also provided by the server side.

## 3.12 Summary

Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request. Although the client/server idea can be used by programs within a single computer, it is a more important idea in a network.

Client-server is a software architecture model consisting of two parts, client systems and server systems, both communicate over a computer network or on the same computer. There are basically three types of architecture available to the user, viz. the Two Tier, Three Tier and N Tier.

Object request broker (ORB) is a piece of middleware software that allows programmers to make program calls from one computer to another via a network (so-called remote procedure calls) thus establishing Client Server relationship. ORB is also instrumental in establishing the client and server side services

## 3.13 Self Assessment Questions

1 What do you mean by Client-Server Architecture? Explain Client and Server Concept

2 What are the different tier schemes available to the programmer in Client Server Architecture?

3 What is an ORB? Explain different functions of ORB.

## 3.14 Reference Books

**Online Reference Material:**


- www.utdallas.edu/~chung/SA/2client.pdf
- en.wikipedia.org/wiki/Client–server model


**Reference Books:**


- berson, A. (1996). *Client Server Architecture.* NewYork: McGraw-Hill.
- Goel, R. (2007). *E-Commerce.* New Delhi: New Age International.
- Jawadekar, W. S. (n.d.). *Management Information System.* New Delhi: Himalaya.

# Unit - 4 : Electronic Data Interchange

**Structure of Unit:**



## 4.0 Objectives

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

- Define the concept of EDI
- Describe why EDI is required
- Discuss the various important features and advantages of EDI
- List the components of EDI and explain the working of each one of these components in Detail
- Describe how to maintain the security of EDI messages
- Discuss the various EDI standards.

## 4.1 Introduction

Electronic data interchange (EDI) is the structured transmission of data between organizations by electronic means, which is used to transfer electronic documents or business data from one computer system to another computer system, i.e. from one trading partner to another trading partner without human intervention.

EDI implies a sequence of messages between two parties, either of whom may serve as originator or recipient. The formatted data representing the documents may be transmitted from originator to recipient via telecommunications or physically transported on electronic storage media." It distinguishes mere electronic communication or data exchange, specifying that "in EDI, the usual processing of received messages is by computer only. Human intervention in the processing of a received message is typically intended only for error conditions, for quality review, and for special situations. For example, the transmission of binary or textual data is not EDI as defined here unless the data are treated as one or more data elements of an EDI message and are not normally intended for human interpretation as part of online data processing".

The key difference between EDI and other forms of electronic mail and fax is that information transferred in EDI is meant for direct use by the recipient computer. The other forms of communication are aimed at humans who read, interpret and act on accordingly.

## 4.2 What is Electronic Data Interchange?

Electronic Data Interchange is the computer-to-computer exchange of routine business data between trading partners in standard data formats. This definition contains 3 key concepts about EDI:

Computer-to-computer: EDI in its most efficient form flows directly out of a sender's computer system directly into a receiver's computer system without any human intervention; however, it is not always possible for EDI to flow in this most efficient manner.

Routing business data: EDI is used for routine business documents like Purchase Orders and Invoices. It is not used for non-routine business documents like complicated contracts or information meant for humans to read and analyze.

Standard data formats: A standard definition of the location and structure of the data is provided. Unstructured text is not EDI.

In 1996, the National Institute of Standards and Technology defined electronic data interchange as "the computer-to-computer interchange of strictly formatted messages that represent documents other than monetary instruments". Thus EDI can be formally defined as the transfer of structured data, by agreed message standards, from one computer system to another without human intervention.

Thus in a layman term Electronic Data Interchange (EDI) is simply a set of data definitions that permit business forms, that would have been exchanged using paper in the past, to be exchanged electronically. This simple set of definitions has spurred a number of organizations to put in place an operational environment in which the exchange of electronic business forms substitutes for the exchange of paper forms.

This has resulted, in some cases, in the establishment of an EDI environment, which arguably represents the most advanced state of electronic commerce today, causing some to view EDI and electronic commerce as one and the same. We view EDI only as a subset of electronic commerce, albeit a very important one. As such, EDI provides an excellent example of a working electronic commerce environment and is a good starting point for examining electronic commerce.

## 4.3 Need of Networking Infrastructure

EDI assumes availability of a wide area network to which organisation can subscribe. All organisations willing to join EDI services must subscribe to the common network. In addition, all organisations participating in a particular EDI services group should agree to a message format that they will use, and load appropriate EDI software on their computer systems.

This software is responsible for providing translation services, EDI services and network access services. When a sender's computer system produces a message and passes it to the translation service software, this translates the message into the common agreed structure and passes it to EDI service software. EDI service software executes necessary functions and procedures to send the message, track it in the network, and ensure that it reaches its destination.

EDI services, in addition, may include procedures to ensure security functions, billing and accounting functions and generate necessary logs for auditing purposes. Network access services are responsible for actually controlling the interaction with the network that transports messages from one site to another.

Electronic data interchange (EDI) offers exchange of business data directly between the computers of one or more trading companies. EDI is a paperless method of transferring such data as orders, forecasts,

invoices and order responses. Some advantages are the elimination of data reentry with the consequent risks of copying errors; process speed also is improved. So, cost reductions can be realized.

EDIs success relies on the use of standardized formats that are recognized by the trading partners in an EDI relationship. Until mid-1996 the data was sent to and received by mainly third-party or value-added networks (VANs) for handling communications and mailboxes (Figure 1). The VANs use a traditional-store-and-forward concept of handling data. Rental fees are charged for use of an electronic mailbox to hold the data. Additional costs are levied for every message sent and retrieved from that mailbox, measured on a volume basis (i.e., the more data you deal with the more you pay). As the Internet matures as an alternative communications method, things are beginning to change. The figure 2 demonstrates the changed pattern.

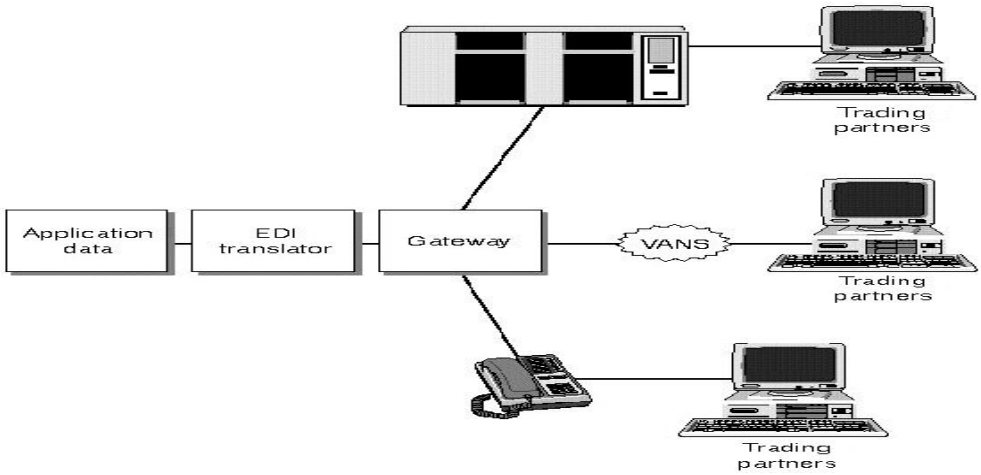


**Figure - 4.1 : Traditional Concept of Electronic Data Interchange**

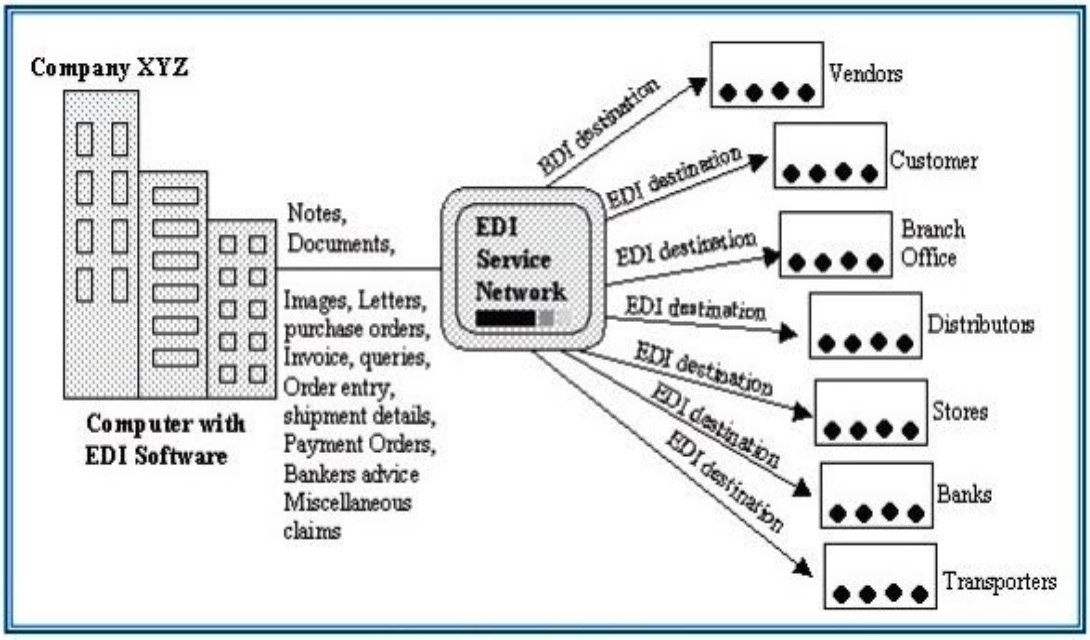


**Figure - 4.2 : Electronic Data Interchange Business Cycle**

The transport network provides a powerful electronic messaging service to support EDI services. Transport network uses a "store and forward mechanism" and messages are sent to 'mail boxes' that are managed by the network service provider. The originator can send his messages at any time independent of the recipient's system status, i.e. whether or not it is ready for receiving. The recipient systems periodic check their mail boxes and transfer messages from network mail boxes to their own memory.

Thus a transfer cycle is completed. The receiving computer applies necessary translator and converts the received message into a format understandable by its application software. The application software is programmed to recognise various messages and take necessary actions such as generating responses to receive messages and updating other databases.

## 4.4 Features of EDI

The EDI process provides many benefits. Computer-to-computer exchange of information is much less expensive than handling paper documents. Studies have shown that manually processing a paper-based order can cost more than Rs. 4000/- or more while processing an EDI order costs less than Rs 100/- . This also means that much less labor time is required and fewer errors occur because computer systems process the documents rather than processing by hand. This results into faster flow of business transactions. More over if we compare with traditional system based on papers than paper purchase orders can take up to 10 days from the time the buyer prepares the order to when the supplier ships it while EDI orders can take as little as one day. Some other benefits are

## 4.5 Working of EDI

Companies using EDI communicate with their Trading partners, in one of the two ways:

1. Exchange of data with several trading partners directly.
2. Interaction with multiple companies through a central information clearing-house.

In the latter case, all transactions take place through a third party's computer system, which then sends them to the appropriate receiver's computer. This enables the sender to communicate with an unlimited number of trading partners without worrying about proprietary system audit trails, variable transmission speeds, and general computer compatibility.

EDI works in the following manner:

1. Prior to any computer work, representatives of two companies interested in exchanging data electronically meet to specify the application in the EDI standard which they will implement
2. The two companies exchange data electronically in the standard formats.
3. Each company adds EDI programs to its computer to translate the company data into standard formats for transmission, and for the reverse translation in the data it receives.

The sender transmits the database formatted in the EDI standards to the receiver who then translates the formatted message to a computer record to be processed and used internally. All transmission are checked both electronically and functionally and the protocol includes procedures for error detection and correction.

Once a company has established standardized communications with another company, it is now in a position to communicate with any other company that is also using the EDI standards.

The Flow of Information in EDI is as follows

- Collection of data for its own operational or statistical requirements which is edited be added to its own database.
- Extraction of Pertinent information by the company from its database, summarized if necessary and constructed into EDI transaction sets, and finally it is transmitted to the company or organization requiring it for valid reasons.

- The frequency of preparing this information is determined by the operational requirements of each recipient.
- A communications link for transmission is established according to the standard communications protocol.
- The Receiver receives the information transmission, checks for its physical characteristics (parity check, character, and transmission mode), and requests for transmission if an error is detected in the physical characteristics of the transmission.
- Checking the functional characteristics of the data receiver and an acknowledgement sent to the original sender for receiving the transmission and to identify any errors detected.
- To process the information received by the receiver according to its own internal procedures and timing requirement.

## 4.6 Advantages of EDI

- Faster transactions support
- Reduction in inventory levels,
- Better use of warehouse space,
- Fewer out-of-stock occurrences and
- Lower freight costs through fewer emergencies expedite.

One drawback to EDI is that companies must ensure that they have the resources in place to make an EDI program work; however, the need for buying and hiring these is very high.

## 4.7 EDI components

The term EDI is a concept; it does not define any technique and does not point to any specified product or service. An EDI transmission can basically be divided into two logical parts: the message itself and the communication.

### 4.7.1 The Message Component

Since the goal of EDI is to have a standardized message, a number of different standards have been developed and established over the years. The most commonly used message standards are:

ANSI ASC X12 - US standard

EDIFACT - standard recommended by the United Nations, used mainly in Europe

UNTDI - UK retail standard

ODETTE - European automotive industry

Others such as HIPAA, VICS, VDA, UCS, etc.

The standardized messages are built by components such as elements, segments, and transactions/messages. Between all objects, there is a separator. The elements are the individually defined fields such as Amount, Name or Quantity. Two or more elements can be grouped together, forming a composite element.

A segment is a set of elements or composite elements built to a logical entity, such as Name and Address or Pricing Information. An envelope contains overall information about the transaction or message, such as sender and receiver, type, and control values. A set of segments put together in a specified order all wrapped in an envelope make up a transaction or message, such as an Invoice or a Purchase Order. The envelope contains information about the sender and receiver, transaction/message type, and so on.

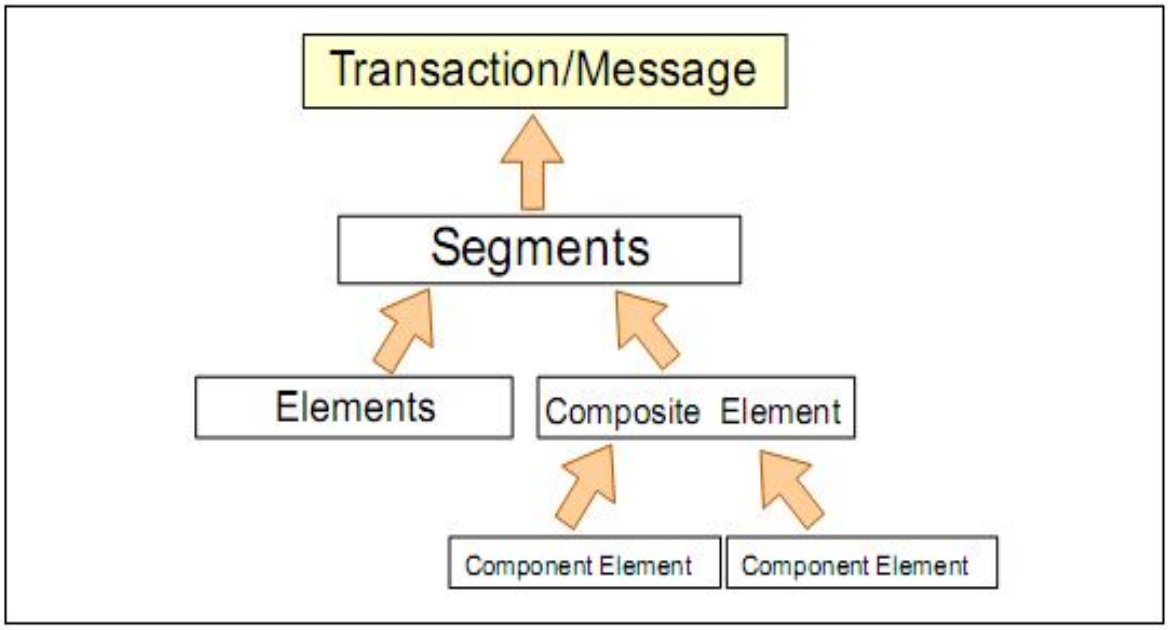


**Figure - 4.3 : Components of EDI Message**

### 4.7.2 The Communication

Transportation of the EDI file over a network can be done in many ways. Any network and any protocol can be used as long as it fits the needs. Three types of communication are discussed here:

VAN communication

Internet (AS1, AS2, FTP, etc.)

Message Queuing

Note that we are focusing more on the communication aspect between two trading partners. There is also a communication aspect within the IT setup of a trading partner. The data has to be sent from the internal applications to the EDI translator software and after translation, the data has to be handed over to some communication software.

**VAN Communication:** For connectivity and exchange of EDI data between enterprises, one option is a direct connection between the trading partners using the X.24 network or leased or dial-up lines. The direct communication method assumes that two partners communicate with a single data communication protocol out of over ten available options.

This works well when only a few partners are involved or if one party can dictate to all their trading partners the single protocol to use. As the number of partners increases, so does the number of protocol options one must support, and therefore the management of the trading partner communications becomes more complex.

This has been the primary driver for the advent of value-added networks (VANs). Unlike the Internet, which is public and free of charge except for connectivity to it, VANs are privately run; companies pay to be registered users and for services. VANs offer services such as EDI packet transportation, conversion

between different EDI versions and standards, audit trails, security, trading partner identification, education, and consulting.

Multiple VAN providers are in existence and bridges are in place between these in order to enable the subscribers of one to do business with the subscribers of another. Connectivity options to the VAN itself from any enterprise vary depending on the VAN provider and connectivity software vendor. Secure messaging-based connectivity using a messaging middleware solution such as WebSphere MQ is the usual choice.

Using a value-added network (VAN) for the transmission of files is traditionally seen as the most secure way of communication. Apart from pure communication, a VAN also provides value-ads such as:

- Built-in security features that help protect against unauthorized access to customer data
- Restart and recovery facilities that help to reduce or eliminate the impact of communications interruptions
- Archive capability for the online retention of data copies
- 24x7 availability
- Notification of message arrivals that meet predefined criteria, such as a message from a specific trading partner

**Internet:** Although the VAN has been a viable proposition for many of the big corporations, its high cost has been a deterrent for its wider adoption by medium-sized and small businesses. Adoption by the latter has been driven largely by the dictates of the big corporations with which they do business. There has been a growing desire among businesses to explore means for driving down the cost of electronic data exchange.

In 1996, a working group called EDI-INT was created by the IETF (Internet Engineering Task Force) to create a set of secure protocols for conducting highly structured inter-enterprise exchanges over the Internet. The requirement was to create a method for packaging EDI/X12, UN/EDIFACT and mutually agreeable transaction sets in a MIME envelope.

Several additional requirements were included for obtaining multi-vendor, interoperable service beyond how the EDI transactions are packed. These revolved around security issues, such as EDI transaction integrity, privacy, and confirmation of source and destination. Currently, there are two main EDI-INT initiatives, known as applicability statements AS1 and AS2, which describe how current Internet standards can be used to achieve VAN functionality.

I. AS1 uses MIME (Multipurpose Internet Mail Extensions) and SMTP (Simple Mail Transfer Protocol).

II. AS2 uses MIME and HTTP (Hypertext Transfer Protocol) for process-to-process real-time EDI.

Although created originally for transporting EDI formatted data, AS1 and AS2 can be used to transport a variety of data types, including XML documents.

**Message Queuing**

Message queuing (MQ) connects commercial systems in today's business. It provides assured, once-only delivery of data in any format.

There is another categorization of EDI components which categorize the components in 4 parts viz.

- Standards
- Software
- Hardware
- Communication

## 4.8 File Types

EDI creates the following files as a document passes through the system

a. Internal Format File (IFF)
b. External Format File (EFF)
c. Transmission File

Each of these files is described in the following sections:

**Internal Format File:** An internal file (IFF) contains a single document for a single trading partner. Internal format file is principally for EDI's own use.

**External Format File:** the external format file (EFF) contains the same date as the internal format file translated into the appropriate standard document format.

**Transmission File:** A transmission file contains one or more documents for the same trading partner. Documents of the same type are packaged together in functional groups. The functional groups going to one trading partner are packaged into an interchange set. An interchange set contains one or more functional groups of documents with the same sender and receiver.

## 4.9 EDI Services

The three EDI services all perform different tasks. The following sections give an overview of what happens in each of three services.

### 4.9.1 Application Services

The Application Service provides the link between a business application and EDI. It allows you to send document to, and receive documents from an EDI system.

A set of callable routines is used to transfer documents from the business application into EDI Documents destinations can be either intra-company or to external companies i.e., trading partners. The EDI Application Service holds each incoming and outgoing document as a single internal format EDI converts the document to a standard format and sends it to the trading partner using the relevant communication protocol. A number of different standards and communication protocols are available.

The following list describes what happens in the application Service:

For outgoing documents:

The business application uses the callable routines to send a document from the business application to the Application Service. The document is now in the EDI system and is called internal format file.

The Application Service sends the document in the internal format file to the Translation Service.

For incoming documents

The Application Service receives an internal format file from the Translation Service.

The Application Service makes the data in the internal format file available in the database so that the business can fetch the document from EDI. A callable interface is used to do this.

### 4.9.2 Translation Services

These services convert outgoing documents from an internal format file to an agreed external format and Translate incoming documents from an external format to the EDI internal format file. The external document standards that an EDI system supports are EDIFACT, X12, TDCC and ODETTE.

For outgoing documents:

The Translation Service receives a document in the internal format file from the Application Service. It converts the internal format file to the appropriate external standard (either EDITFACT, X12, TDCC, or ODETTE). The file is now an external format file.

The Translation Service combines one or more external format file into a transmission file.

The Translation Service now sends the transmission file to the Communication Service.

For Incoming documents

The Translation Service receives a document in the transmission file from Communication Service.

It then separates the transmission file to produce external format files.

It translates each external from file, which may be in an external standard (either EDIFACT, X12, TDCC or ODETTE) to the internal format file. The file is now an internal format file.

The Translation Service now sends the internal format file to the Application Service.

### 4.9.3 Communication Services

The Communication Service sends and receives transmission files to and from the trading partners either directly or by using party service called a value Added Networks (VAN).

The following list describes what happens in the Communication Service:

For outgoing documents:

The Communication Service receives a transmission file from the Translation Service. It checks the file to see which trading partner it has to be sent to. When it has identified the type of connection to be used for this trading partner it determines which gateway to use.

The Communication Service sends the Transmission file to the trading partner.

For incoming documents:

The Communications Service receives a transmission file from the trading partner. The file arrives through one of the gateways that EDI support.

The Communication Service sends the transmission file to the Translation Service.

## 4.10 Electronic Fund Transfer

An Electronic Fund Transfer (EFT) system involves the electronic movement of funds and fund information between financial institutions. The transfers are based on EDI technology transfer of funds and involves minimum amount of data interchange between two parties. There are two major worldwide EFT networks: the Clearing House Interbank Payments System (CHIPs) and FedWire (the oldest EFT in the US).

In 1993, these networks moved an estimated US $ 1.4 billion each banking day. A third major network, the Society for World-wide Interbank Financial Telecommunication (SWIFT) is capable of handling nearly 1 million messages per day.

EDI has been widely adopted by financial institutions and service sectors in the western world. Insurance brokers can send EDI messages to the computers of various insurance companies and get details on specific policies. Even though EDI can be useful for almost any sector, banks have been the primary user for EDI services till now.

The next figure illustrates the concept in simpler terms

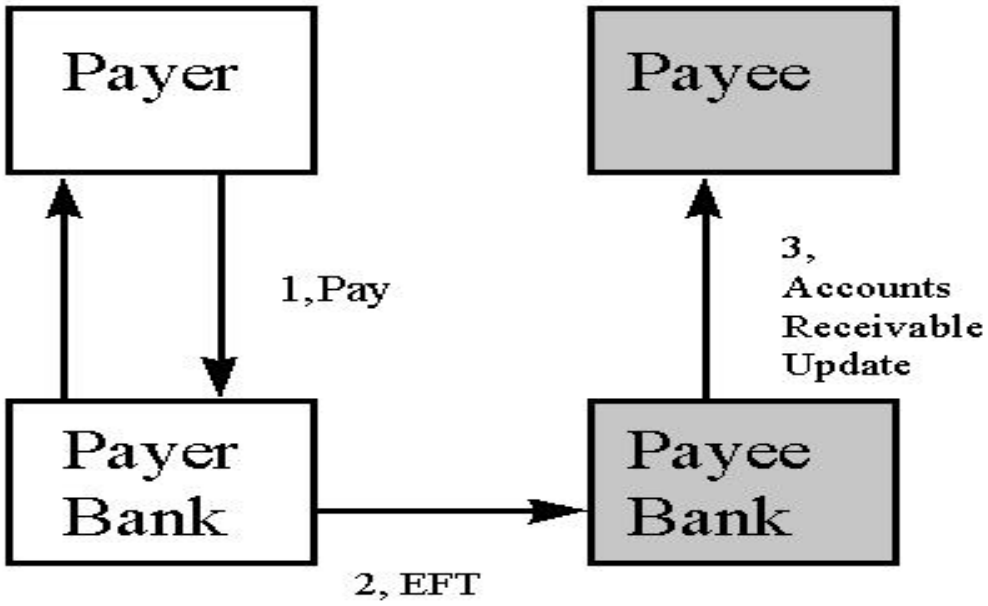


**Figure - 4.4 : Illustration of Electronic Fund Transfer**

## 4.11 Security of EDI Messages

There have been many attempts over the years to understand the security requirements for EDI. One of the most important efforts is described in the European report "Security in Open Networks" [SOGI89].

This report, commonly referred to as the SOGITS Report, confirmed the business need for EDI security. It identified EDI as the most important and demanding use of open networks, and, through an extensive survey covering 49 organizations in 12 countries in Europe, it reinforced the need for a range of solutions addressing several key areas of technical work. Since the publication of this report, several other European and international initiatives have contributed to the progression of work in a number of areas.

One must assume that EDI may be used across a wide-ranging messaging continuum covering different types of network services and various value-added application platforms. This range of communications provision will reflect a need for different levels and types of security to protect these EDI messages. The EDI components chain and the emerging EDI enabling technologies to support this chain are migrating the proprietary/direct-link type of offering to the Open-EDI approach based on international standards.

EDI security appears at several interrelated stages of system technology:

- The user/application interface,
- EDI applications and value-added services,
- The processing (both batch and interactive) and storage of EDI messages, and
- The communication of these messages in an open systems environment.

The basic security objectives that may need to be met at each stage are those of authentication and integrity, nonrepudiation, access control, availability, audit, and accountability. These objectives will need

to be satisfied by both logical and legal controls and procedures, which are supported by a range of technologies, tools, and standards. ISO basic reference model 7898/2 specifies an internationally adopted security architecture for end-to- end security in network inter-connection. The five services defined in the model and their short definitions are:

- Authentication: verifying the identity of communication entities in a network
- Access control: restricting access to the information and processing capabilities of a network to authorized entities.
- Confidentiality: preventing the unauthorized modification of information
- Integrity: detecting the unauthorized modification of information
- Non-repudiation: preventing denial by one of the entities involved in a communication of having participated in all or part of the communication

The industry has tackled many aspects of EDI security. In particular, the most important work in this area concerns EDI messaging based on the use of International Message Handling Standards [CCIT88a], [CCIT90].

CCITT, in its 1988 version of the X.400 recommendations for message handling (and the corresponding ISO 10021 equivalent standard), has made major extensions to the Message Transfer System (MTS) to provide for secure messaging [CCIT88a].

The 1988 X.400 standard allows the provision of different types and levels of security service independent of the type of message being transferred. Applying security mechanisms to the MTS ensures that the benefits of secure messaging are obtained independent of the content type of the message.

For some content types, additional security mechanisms may be defined in the content-type protocol. The security specified in this standard thus provides for secure message transfer services and distributed interworking in support of applications such as electronic mail and EDI,

The security model used to specify the security features of the 1988 standard is based on a threat assessment of an assumed messaging environment. This assessment considers the main threats to be associated with the unauthorized access to the messaging system, threats to the message itself, and intra-message threats.

## 4.12 EDI Standards

The development of new ways of doing business is often paralleled by the development of industry standards. EDI standards fall under the auspices of the American National Standards Institute (ANSI) which chartered the Accredited Standard Committee X12 (ASCX12) in 1979.

The ASCX12 Committee's objective is to develop uniform standards for inter-industry electronic interchange of business transactions. In 1987 UN published its standards and named it as UN/ EDIFACT (EDI for Administration, Commerce and Transport). Most of the UN/EDIFACT standard transaction sets are similar to ASC X12 Standard.

Transaction Set Standards: These define the procedural format and data content requirements for specified business transactions, e.g., Purchase orders.

Data Dictionary and Segment Dictionary: These define the precise content for data elements and data segments used in building transaction sets.

Transaction Control Standards: These define the formats for the information required to control the data interchange.

- Data movement from one system to another may be initiated in several ways:
- Inquiry transaction set received from another system.
- Previously established schedule.
- Exceptions (management by Exception)
- Detection of errors in data received from another system
- Inquiry transaction set generated in response to management needs.

The interface computer program and the structure of each type of transaction set are part of the EDI standards. EDI does not address a standard, which extends into a company's internal system.

EDI standards and documentation for transportation include:

- Information structure
- System rules and procedures
- Programming guide

## 4.13 Summary

Electronic data interchange (EDI) is the structured transmission of data between organizations by electronic means, which is used to transfer electronic documents or business data from one computer system to another computer system, i.e. from one trading partner to another trading partner without human intervention.

Thus in a layman term Electronic Data Interchange (EDI) is simply a set of data definitions that permit business forms, that would have been exchanged using paper in the past, to be exchanged electronically.

Some of the advantages of EDI are faster transactions support, Reduction in inventory levels, Better use of warehouse space, fewer out-of-stock occurrences and lower freight costs through fewer emergencies expedite.

There are 2 components of EDI - The Message Component and The Communication Component.

The Three EDI services are

- Application Services
- Translation Services and
- Communication Services

The EDI standards have been adopted to remove any bottlenecking if present from the system .

## 4.14 Self Assessment Questions

1 What do you mean by Electronic Data Interchange?

2 What are the Components of EDI? Explain

3 Briefly explain various Electronic Data Interchange services

4 What is EFT? Elucidate with an example.

## 4.15 Reference Books

**Online Reference Material**

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# Unit - 5 : Electronic Markets

**Structure of Unit:**



## 5.0 Objectives

After completing this unit, you will be able to:

- Understand the concept of e-marketing;
- Learn how to plan e-marketing;
- Understand situation analysis in e-marketing;
- Know how to do objective setting in e-marketing;
- Understand the new age of information-based marketing;
- Understand the advantage of advertising on the internet;
- Chart the online marketing process;
- Learn the concept and importance of market research;
- Understand the various paradigms of consumer search and resource discovery.

## 5.1 Introduction

Electronic Marketing (E-Marketing) can be viewed as a new philosophy and a modern business practice involved with the marketing of goods, services, information and ideas via the Internet and other electronic means. By reviewing the relevant literature it is noticed that definitions of electronic marketing (E-Marketing) vary according to each author's point of view, background and specialization. For that, while Smith and Chaffey defines it as: "Achieving marketing objectives through applying digital technologies" (Smith and Chaffey, 2005: 11), Strauss and Frost define it as: "The use of electronic data and applications for planning and executing the conception, distribution and pricing of ideas, goods and services to create exchanges that satisfy individual and organizational goals." (Strauss and Frost, 2001: 454)

The value propositions of products and services offered in the physical world are essentially limited 'point solutions' that meet only part of a consumer's need or want. In the online world, even a simple banner advertisement can be both an advertisement and a direct marketing service. The banner raises the passive consumer's awareness of a product. Yet it also encourages the consumer to pursue action by clicking on it. There are two reasons for building the concept of e-marketing around consumer experiences. First, this

approach forces marketers to adopt the consumer's point of view. Second, it forces managers to pay attention to all aspects of their digital brand's interactions with the consumer, from the design of the product or service to the marketing message, the sales and fulfillment processes, and the after-sales customer service effort.

## 5.2 What is e-Marketing?

E-marketing means using digital technologies to help sell your goods or services. These technologies are a valuable complement to traditional marketing methods whatever the size of your company or your business model. E-Marketing provides businesses and advertisers with an easily customised, efficient form of marketing to complement existing advertising strategies and close in on the elusive and profitable interactive market.

The simplest definition of e-Marketing could be that suggested by Mark Sceats: "The Marketing that uses internet as a manifestation channel."

A more comprehensive, practical definition is the one formulated by specialists of CISCO company: "e-Marketing is a generic term utilized for a wide range of activities – advertising, customer communications, branding, fidelity programs etc., using the internet." More than the simple development of a website, e-Marketing focuses on online communications, direct dialogue with consumers who thus participate in the creation of new products, finding efficient methods to win customer's fidelity, and ease their business-making process. E-Marketing is the sum of activities a company makes with the purpose of finding, attracting, winning and retaining customers. E-Marketing has developed over the past few years into a standalone discipline, with its own conceptual apparatus, tools and laws.

E-marketing is growing faster than other types of media. It has had a large impact on several previously retail-oriented industries including music, film, pharmaceuticals, banking, flea markets, as well as the advertising industry itself. Across the world, e-marketing is now overtaking radio marketing in terms of market share. In the music industry, many consumers have been purchasing and downloading music (e.g., MP3 files) over the internet for several years in addition to purchasing compact discs. By 2008 Apple Inc.'s iTunes Store had become the largest music vendor in the United States.

The number of banks offering the ability to perform banking tasks online has also increased. Online banking is believed to appeal to customers because it is more convenient than visiting bank branches. Internet auctions have gained popularity. Unique items that could only previously be found at flea markets are being sold on eBay. As the premier online reselling platform, eBay is often used as a price-basis for specialized items.

### 5.2.1 History of e-marketing

First there were websites and they were pictured as online brochures. People found websites mainly because they saw them printed in adverts and on business cards. People delighted in the immediacy of sending and receiving email. Just over ten years ago, people still thought it was pretty cool marketing to have a site that could also collect the email addresses and contact details of users. Companies sent newsletters to their customers and prospects with great effect. As websites multiplied beyond anyone's imagination, searching for them became increasingly important. Websites became the first contact many customers had with the company, so articles and content was added to interest and persuade them. They stopped being static brochures.

Google became the dominant search engine and Search Engine Optimization was born. SEO specialists interpreted the Google search algorithm and built websites that complied with the way their spiders wanted

to assess the quality of content. Google assessed the authority of links from a website by grading it from 0-10 and giving it a PR rank. Links to a website increased its authority, pushing it further up Google's search results. An SEO market in links emerged and thrived. High PR links became valuable commodities.

Search engines, particularly Google, became fat from the advertising on their results pages which gave companies a quick leap-frog to prominence on a pay-per-click basis. Blogs were born. The structure and nature of blogs gave them a head-start in Google's search engine results and PR assessments. Their numbers exploded, massively increasing the pool of links. Niche marketers exploited these strengths and created thousands of blogs dedicated to selling products through affiliate schemes and running pay-per-click advertising. Blogging brought internet revenues to the masses.

Browsers got cleverer, internet usage continued its exponential growth, and Web 2.0 came along. Interaction, personal relationships and multimedia became the new marketing challenges as their platforms absorbed more and more internet traffic. Social sites burgeoned. Users' insatiable desire for the 'new' became the driver for the creation of streams of constant content. Google changed its search design to allow searching for the new, distracting traffic from simply looking at the stale, main search results. Users wanted the freshest content. Marketers complied. Youtube, Facebook, Flickr and Twitter became some of the most important new channels that marketers needed to broadcast on. Doing well on these platforms not only helped boost search engine result ranks, they also pushed links to appear in all the other types of search.

Integrated, cross-platform marketing allowed real time results measurement, and marketing planning became more dynamic and reactive. Companies pushed out a campaign and then hurriedly tweaked, added and subtracted to it so that they could motivate their targeted market. Search started to lose its grip on web traffic dominance as Facebook grew. Comments and 'likes' from users are becoming a new commodity on a marketer's shopping list. Traffic no longer needs to be directed back to a website because companies can engage and convert their customers right there on their chosen social platform.

The history of online marketing has been short but rapidly evolving. Change is accelerating, which has caught many companies with their pants down. Small and medium-sized companies that basked in the glory of high search rankings are seeing their market whittled away. Companies need to develop assets in new market channels if they are to maintain their market share, and they need to do so with urgency.

### 5.2.2 Advantages of e-marketing

Following are some of the advantages of e-Marketing:

- **Reduction in Costs Through Automation and Use of Electronic Media:** Internet marketing is relatively inexpensive when compared to the ratio of cost against the reach of the target audience. Good planning and excellence in the execution of an effectively targeted e-marketing campaign can reach desired audience much better than large scale traditional marketing channels.
- **Faster Response to Both Marketers and the end User:** Internet marketing is able to, in ways never before imagined, provide an immediate impact. Imagine the consumer is reading his/her favorite magazine. He/She sees a double-page advert for some new product or service, maybe BMW's latest luxury sedan or Apple's latest iPod offering. With this kind of traditional media, it's not that easy, for the consumer, to take the step from hearing about a product to actual acquisition. With e-Marketing, it's easy to make that step as simple as possible, meaning that within a few short clicks the consumer could have booked a test drive or ordered the iPod. By closing the gap between providing information and eliciting a consumer reaction, the consumer's buying cycle is speeded up and advertising spend can go much further in creating immediate leads.

- **Increased Ability to Measure and Collect Data:** The nature of the medium allows consumers to research and purchase products and services at their own convenience.
- **Opens the Possibility to a Market of One Through Personalization With Increased Interactivity:** Whereas traditional marketing is largely about getting a brand's message out there, e-Marketing facilitates conversations between companies and consumers. With a two-way communication channel, companies can feed off of the responses of their consumers, making them more dynamic and adaptive. It is easy to target a product to a language or location. Even the workflow of a website can be changed in order to match the products the users want and visit.
- **Global Audience:** Companies can reach a wide audience for a small fraction of traditional advertising budgets. While traditional media costs limit this kind of reach to huge multinationals, e-Marketing opens up new avenues for smaller businesses, on a much smaller budget, to access potential consumers from all over the world.
- **Convenience:** Businesses have the advantage of appealing to consumers in a medium that can bring results quickly.
- **Effectiveness Measurement:** Internet marketers also have the advantage of measuring statistics easily and inexpensively. Nearly all aspects of an Internet marketing campaign can be traced, measured, and tested. The results of campaigns can be measured and tracked immediately because online marketing initiatives usually require users to click on an advertisement, visit a website, and perform a targeted action. Such measurement cannot be achieved through billboard advertising, where an individual will at best be interested, then decide to obtain more information at a later time.
- **Accountability:** Because exposure, response, and overall efficiency of Internet media are easier to track than traditional off-line media - through the use of web analytics for instance, internet marketing can offer a greater sense of accountability for advertisers.
- **Adaptivity and Closed-loop Marketing:** Closed-Loop Marketing requires the constant measurement and analysis of the results of marketing initiatives. By continuously tracking the response and effectiveness of a campaign, the marketer can be far more dynamic in adapting to consumers' wants and needs. With e-Marketing, responses can be analyzed in real-time and campaigns can be tweaked continuously. Combined with the immediacy of the Internet as a medium, this means that there's minimal advertising spend wasted on less than effective campaigns.
- **24-hour 'Out There':** With a website, companies can sell and present their products even when off working hours of employees.
- **Instant Purchase Functionalities/Conversion Rate:** If a website allows people to buy a product, then efforts must be focused on the fact that they are only a few clicks away from completing a purchase. Traditional marketing methods don't allow this. People have to change direction or postpone their will to buy (start a phone call; go to a shop or a post office).

### 5.2.3 Limitations of e-Marketing

Following are some of the limitations of e-Marketing:

- **Dependability on Technology:** Internet marketing requires customers to use newer technologies rather than traditional media.
- **Maintenance Costs:** due to a constantly evolving environment.

- **Higher Transparency:** Pricing and increased price competition.
- **World Wide Competition :** through globalization.
- **Speed of Internet Connections:** Low-speed Internet connections are another barrier. If companies build large or overly-complicated websites, individuals connected to the internet via dial-up connections or mobile devices may experience significant delays in content delivery
- **Inability to Experience the Merchandise:** From the buyer's perspective, the inability of shoppers to touch, smell, taste or 'try on' tangible goods before making an online purchase can be limiting. However, there is an industry standard for e-commerce vendors to reassure customers by having liberal return policies as well as providing in-store pick-up services.
- **Security Concerns:** Information security is important both to companies and consumers that participate in online business. Many consumers are hesitant to purchase items over the internet because they do not trust that their personal information will remain private. Encryption is the primary method for implementing privacy policies.
- **Solution:** Companies provide guarantees on their websites, claiming that customer information will remain private. Some companies that purchase customer information offer the option for individuals to have their information removed from the database, also known as opting out. However, many customers are unaware if and when their information is being shared, and are unable to stop the transfer of their information between companies if such activity occurs.
- **Goods Ordered v/s Goods Received:** Another major security concern that consumers have with e-commerce merchants is whether or not they will receive exactly what they purchase.

## 5.3 e-Marketing Planning

### 5.3.1 Introduction to E-marketing plan:

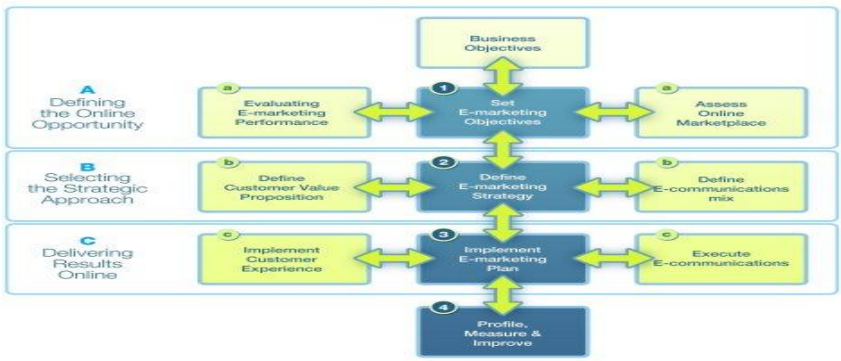


**Figure-5.1 Source: Google Images**

E-Marketing plan is a strategic document developed through analysis and research and is aimed at achieving marketing objectives via electronic medium. E-Marketing plan represents a sub-set of organization's overall marketing plan which supports the general business strategy. Every good e-Marketing plan must be developed in line with the organization's overall marketing plan.

In a broad sense, e-Marketers generally start by analyzing the current micro and macro-economic situation of the organization. E-Marketers must observe both internal and external factors when developing an e-Marketing plan as trends in both micro and macro environment affect the organization's ability to perform business.

Examples of micro environment elements are: pricing, suppliers, customers.

Examples or macro environment are: socio-economic, political, demographic and legal factors.

### 5.3.2 Stages in developing an e-marketing plan

It is important to recognize that planning for e-marketing does not mean starting from scratch. Any online e-communication must be consistent and work with the overall marketing goals and current marketing efforts of a business.

The main components of an e-marketing plan will typically include the following stages:

- **Identify Target Audience** – If multiple targets are identified, they must be ranked in order of importance so that one can allocate resources accordingly. Each target group must be targeted and their requirements and expectations must be understood. This type of customer segmentation will help companies choose the right tactics for their plan.
- **Understand the Competitors** – Companies must profile their competitors and the market in which they operate. What types of online marketing do competitors use and how well do they perform? This type of benchmarking will help understand the environment in which companies are operating.
- **Set the Objectives** - Possible objectives could include raising awareness of the brand, improving sales or online registrations, improving customer retention, providing greater internal efficiencies such as decreased marketing costs and reduced order-taking and fulfillment costs. The objectives that one chooses, depends on one's business needs.
- **Plan the Tactics** – Once companies have a top-level strategy including the overall objectives, they need to identify the tactics that they want to use. The plan can also cover any other non-internet marketing activities that are being undertaken. One has to think about how to measure the success - build in feedback mechanisms and regular reviews to enable one to assess the performance of the e-marketing activities and identify areas for improvement.
- **Agree on a Budget** - Careful budgeting allows preventing costs spiraling out of control. Identification of the returns expected to make from investment in e-marketing activities, and comparing these with the costs in order to develop a cost/benefit analysis.

## 5.4 Situation Analysis

The situational analysis is designed to take a snapshot of where things stand at the time the plan is presented. The situation analysis section of an e-marketing plan needs to describe the context in which e-marketing will take place. It should include an analysis of a business' internal (micro) and external (macro) environments.

Internal considerations include:

- customers
- market, and any trends in this
- current online proposition
- competitors

External considerations could be:

- social - how changing consumer attitudes could affect the approach
- legal - i.e. complying with e-marketing laws, such as data protection
- environmental - e.g. making sure the approach is ethical and sustainable
- political - how local or national government could impact the plan
- technological - how advances in technology could affect the marketplace

## 5.5 Objective Setting

Smith and Chaffey (2001) suggest there are five broad benefits, reasons or objectives of e-marketing. This framework is useful since it presents a comprehensive range of objectives. Marketers will decide whether all or only some will drive e-marketing:

- **Sell:** Grow sales (through wider distribution to customers, one can't service offline or perhaps through a wider product range than in-store, or better prices)
- **Serve:** Add value (give customers extra benefits online: or inform product development through online dialogue and feedback)
- **Speak:** Get closer to customers by tracking them, asking them questions, conducting online interviews, creating a dialogue, monitoring chat rooms, learning about them
- **Save:** Save costs of service, sales transactions and administration, print and post. Can transaction costs be reduced and therefore online sales made more profitable? Or use cost-savings to enable to cut prices, which in turn could enable to generate greater market share?
- **Sizzle:** Extend the brand online. Reinforce brand values in a totally new medium. The Web scores very highly as a medium for creating brand awareness, recognition and involvement.

### 5.5.1 The Online Revenue Contribution

The key objective for e-marketing is the online revenue contribution. This is a measure of the extent to which a company's online presence directly impacts the sales revenue of an organization. Online revenue contribution objectives can be specified for different types of products, customer segments and geographic markets.

Companies that can set a high online revenue contribution objective of say 25% for 2 years time will need to provide more resource allocation to the internet than those companies who anticipate a contribution of 2.5%. Cisco Systems Inc (www.cisco.com) maker of computer networking gear is now selling around 90% of its 20 billion dollars sales online. This was achieved since senior executives at Cisco identified the significance of the medium, setting aggressive targets for the online revenue contribution and resourcing the e-commerce initiative accordingly.

However, for some companies such as an FMCG manufacturer, it is unrealistic to expect a high direct online revenue contribution. In this case, an indirect online contribution can be stated. This considers the Internet as part of the promotional mix and its role in reaching and influencing a proportion of customers to purchase the product or in building the brand. In this case a company could set an online promotion contribution of 5% of its target market visiting the web site and interacting with the brand. Where sales achieved offline is a consequence of online selection of products this is referred to as the indirect revenue contribution.

## 5.6 Information-based Marketing

This type of marketing is based on distributing quality and relevant information for free to prospects who request it. In exchange, the prospect gives their contact information, enabling marketers to enter his or her name into their database and continue marketing and/or communicating with them.

Typically, law firms will produce a free report, book or informational pamphlet or brochure on a topic that is important to their prospective clients. For instance, a personal injury attorney might produce a report that is focused on helping accident victims avoid the mistakes that could jeopardize a claim.

Of the many ways to get word out about a product or service being promoted, information-based marketing will remain tops over all other methods. This type of marketing is in a sense, timeless. Providing good information to readers and potential customers is something that worked 20 years ago, is working today, and will continue to work in the future. By using good information-based marketing practices marketers are helping people to make an informed decision about what they are looking for.

In reality, they are providing a service to the potential customer and branding themselves as someone knowledgeable about the product or service. People do remember where and who provided the information they are looking for which will help you build relationships and trust.

As an example lets say you are looking to purchase a home air purifier and have narrowed your choices between two brand name makers of these products. Look at these two examples.

- **Company A:** Our purifiers are made with the quality of parts and workmanship that meet or exceed all industry standards. You will receive your purifier in tamper proof packaging guaranteed free of all defects.
- **Company B:** When you receive your purifier, simply choose your desired location, plug it in, turn it on and your purifier is working instantly to give you clean pure air. Our purifiers run quieter, take up less space, and are more energy efficient than our closest competitor.

With Company A we've really learned nothing about their product. We've already determined they should be of good quality due to their well known brand name, and we certainly don't expect to receive a defective unit.

With Company B we've already learned what to do with the product when we get it, but also several benefits we will receive by purchasing their product. It gives the reader more reason to buy that product and the knowledge of why they should.

### 5.6.1 Who Would You Be More Likely to Buy From?

There are times when there is a fine line between wanting something and actually needing something. With good information-based marketing one can provide the reader the information they are seeking which will help them justify their purchase. People buy things for different reasons but the more they feel justified in making that purchase the better they will feel about that purchase.

With information-based marketing the goal is to develop a relationship with the reader and potential customer. They are looking for information on a certain product or service, not some hyped up sales pitch. By providing good quality information on the product or service, marketers are giving the reader a reason on why they should consider their offer and good justification on making a purchase from customer.

Understanding the difference in selling and providing information to the reader can make a big difference in the marketing efforts. With information-based marketing one is more like a consultant or problem solver than a sales agent. Marketers are giving the reader a solution to their problem or needs, which in turn will convert into more sales for their marketing efforts.

### 5.6.2 Luxury Brands Must Adopt Information-Based Marketing

Marketers of goods and services for high-net-worth households (top 2% income, 1% of assets) have historically operated on the instinct of their founders or designers. But as the economy presents new challenges, as competition increases, and as leading competitors become publicly owned, reliable information and systematic decision-making processes are required.

### 5.6.3 Steps in Lifestyle Marketing Process

One approach is lifestyle marketing, the strategy of appealing to the pattern of underlying values (personal drivers) and tangible benefits (attributes) that create harmony in a target lifestyle segment. The lifestyle marketing process involves a series of nine steps, which are summarized here.

**Defining the Lifestyle of the Target Consumer:** Lifestyle is a better tool statistically for segmenting affluent consumers than everything except gender. It is more likely than age, income, education, zip code, etc., to predict what affluent people will do and why. Targeting a lifestyle rather than a demographic provides a more detailed definition of the best prospect; how many, why they buy and specifics about how to reach them.

**Project the Desired Results:** If a brand has a goal of achieving a certain share of market at a certain price point, it can break that into shares of specific lifestyle segments. This step allows the development of budgets, projecting marketing ROI, etc., to form the basis for making decisions about advertising, communications, distribution, channel support, and the other tactics in the marketing mix.

**Positioning:** Lifestyle segments have clear priorities regarding which values (personal drivers) they are interested in satisfying. Some luxury brands refer to priorities as 'passions'. A brand can compare alternative positioning within a lifestyle segment to determine which of the high priority drivers (passions) it can be most competitive and successful in satisfying. For example, Lexus focused on satisfying the personal drivers associated with 'practical' and 'avoiding social discomfort', whereas BMW competes on 'makes me feel good' and 'performs as intended'.

**Product and Service Differentiators:** After deciding on the personal drivers, the marketer must decide which tangible product and service attributes provide proof that the needs will be satisfied. Again, the importance of these attributes varies by lifestyle. This step would be very important in marketing any activity, such as travel, which has a culture aspect. For example, each lifestyle places a different priority regarding the relative importance of culturally related activities when traveling.

**Developing an Integrated Multi-channel Strategy:** Today most consumers, even the most affluent, shop multiple channels. But luxury brands are often tentative about developing multi-channel strategies. There is a concern that marketing in the more direct channels (catalogue, Internet, direct sales, etc.) will create confusion or lower the perceived prestige of the brand.

**Word of Mouth:** Recommendations from peers and family are the greatest influence on all lifestyles. The principle communication question then is how to create positive word of mouth. The answer varies by lifestyle with some more influenced by publicity and editorial than by advertising.

**Relationship Building:** Many premium brands are already shifting more money into non-traditional modes that emphasize creating links with many aspects of an affluent consumer's life. For example, with non-profit organizations the affluent cares about, involvement with these organizations (we call social networking) creates access and intimacy.

**Personalization:** Lifestyle marketing provides real personalization in direct marketing. Marketers need a database which identifies the lifestyle of each individual household in the most affluent areas to target messages to the personal drivers and preferred attribute of each recipient.

**Alignment:** Finally, after a lifestyle marketing strategy is developed, the marketer can check to ensure that there is alignment of all elements in the marketing process. Only a research-based framework can guide decisions at each step of the marketing process.

## 5.7 Advertising on the Internet

'Advertising must tell the truth and not mislead consumers'.

Internet or Online Advertising is just a way for traders to publicize products and services online. Ads can target people with demanding hobbies or interests, or they can even focus on customers in a particular country or state. The success of an Internet advertising campaign is easier to monitor, and several methods are available to businesses. Internet advertising is also well-known as e-Marketing, Internet marketing, web marketing and online marketing. In 2005, all forms of online advertising expenditures achieved $15 billion in the United States and $5 billion in Europe. Online advertising expansion in the United States was forecast at 18-19 % and European growth was estimated at 25% per year (Stone, 2007). The first simple static banner appeared on HotWired in 1994 for AT&T. The advertisement asked, 'Have you ever clicked your mouse right here?' and an arrow pointed to a button that stated 'You will.' When somebody clicked on the button, they were directed to the AT&T site (Hollis, 2005 p.255).

In terms of efficiency, if not size, the advertising industry is only now starting to grow out of its century-long infancy, which might be called 'the Wanamaker era'. It was John Wanamaker, a devout Christian merchant from Philadelphia, who in the 1870s not only invented department stores and price tags, but also became the first modern advertiser when he bought space in newspapers to promote his stores. And, with his precise business mind, he expounded a witticism that has, ever since, seemed like an economic law: "Half the money I spend on advertising is wasted," he said. "The trouble is, I don't know which half."

What Wanamaker could not have foreseen, however, was the internet. A bevy of entrepreneurial firms - from Google, the world's most valuable online advertising agency disguised as a web-search engine, to tiny Silicon Valley upstarts, many of them only months old - are now selling advertisers new tools to reduce waste. These come in many exotic forms, but they have one thing in common: a desire to replace the old approach to advertising, in which advertisers pay for the privilege of 'exposing' a theoretical audience to their message, with one in which advertisers pay only for real and measurable actions by consumers, such as clicking on a web link, sharing a video, placing a call, printing a coupon or buying something.

In the late 1990's banner ads were sold on a cost-per-thousand (CPM) basis. Web sites that had very attractive audiences could charge more for 1000 impressions of an ad than web sites that had less affluent, or less consumer-focused audiences. Between 1995 and 1998, many big companies established web sites and improved their online marketing. Pop-up advertising, where an ad is served in a new window, gained in popularity in the late 1990's. By 1998, over $1 billion were spent in Internet advertising. In 2000, Google started Google AdWords to appeal to the small business audience. By filling out a form and supplying a credit card, small firms could promote on Google in competition with major brands. However, troubles with high cost-per-impressions or CPM rates led to an auction-based model by the spring of 2002 using cost-per-click (CPC).

In 2003, Google changed online advertising with AdSense - contextual targeted ads based on the technology of its new achievement - Applied Semantics. Contextual advertising utilizes the context of an article or story a user is reading and matches it with associated product or service advertising. Google continues to innovate with **Froogle**- a database of listings; **Google maps -** for geo-targeting; **Google Base -** for lists; **and YouTube** - for enhanced video. All of these Google additions offer many new online advertising opportunities. If we want to quickly reach a global audience for a product or service, then Internet advertising is the best way. On the other hand, the major advantage is that Internet advertising is generally far cheaper than advertising through more traditional means such as newspapers, radio or television. Internet advertising is the faster growing form of marketing because Internet advertising can be tracked and tested in ways unavailable

to regular methods of advertising. This allows the advertiser to instantly know what works and what doesn't.

### 5.7.1 Advantages of Online Advertising

- **Cost -** As compared to newspaper placements or TV spots, online banners are still relatively inexpensive.
- **Instant Gratification** - Customers can see the online ad, shop, and buy without leaving home. That sort of convenience is hard to beat.
- **Testing -** On the internet, response (or lack of response) is lightning fast. Also, since it's relatively simple to switch out banner ads, online advertising gives the ability to test creative campaigns and fine tune messaging. This can help increase effectiveness of campaigns and enhance results.
- **Geo-targeting** - Online advertising gives the ability to geo-target ads, ensuring that they are only viewed, and clicked by intended geographic and niche audience. This allows creating localized messages that appear on national sites.
- **Constant Exposure** - Online ad works 24 hours a day, 7 days a week.

### 5.7.2 Disadvantages of Online Advertising

- **Advertising Overload** - Every advertiser wants consumer attention, and often there is simply too much information to digest. The solution is to develop creative campaigns that will cut through the clutter and strike an emotional connection with target audience.
- **Measurability** - The statistics gathered from online advertising campaigns are so immense that they can often become paralyzing. That's why it's important to determine at the onset of the campaign, how to measure success – is it impressions, click-throughs, or sales?
- **Scope** - While the vast majority of people are active online, there are still a number of people out there who are relying on traditional forms of advertising as a means to gather information on products and services. That's why, in most cases, online advertising campaigns should run in tandem with other marketing efforts.
- **Too Many Choices** - There are so many websites out there that it can be hard to identify the ones that will most effectively target audience. Buyers must make sure to take the time to research the appropriate niche sites for their product or service.

## 5.8 Charting the Online Marketing Process

Early Internet marketing efforts were oriented toward technology and consequently emphasized the product and its associated information. In recent years there has been a shift in Internet marketing from complex, information-heavy products, such as software and hardware with their multitude of features, to more commodity-like items like stock quotes, newsletters or flowers. This has resulted in the emphasis shifting from the product focus to the marketing process of reaching and getting close to the customer. It is this elusive transition from product to process, that firms must understand and adapt to in the emerging marketplace.

The unique characteristics of the Internet environment can assist in this monumental task. The ability to reach global markets at no extra cost alone has the potential to break down the prevailing cost barrier separating small businesses from large corporations. Exorbitant advertising costs have traditionally represented the final barrier to growth for small businesses that could not afford national, let alone international, advertising. With no hyperbole intended, the development of effective methodologies for using the Internet as an

international marketing tool could well revolutionize the new product introduction process.

Contrary to the hype, marketing on the Internet is neither as easy nor as straightforward as it appears at first glance. Understanding how this process works can help to unravel the 'mystery' of Internet marketing. It includes creating a marketing plan, distributing an advertisement and interacting with customers in a clear step-by-step manner.

**1. Segment and Identify the Audience**

- **Market Segmentation** is the process of dividing the market into separate and distinct customer groups. Its purpose is to determine differences among customers that may be of consequence in choosing whom to target and how, a prerequisite for product positioning. Segmentation allows companies to identify their target audience, all of whom need to know about the existence of a better product and still need to be convinced that they need one.

Typical segmentation approaches that need to be reengineered and carried out on the Internet include the following:

- **Demographic Approaches –** to categorize the market in terms of population characteristics such as age, sex, income, occupation, family size or religion. The goal is to find the relationship between profits or volume and the identifiable demographic characteristics, and to use those characteristics for formulating the marketing programs.

- **Benefit or Behavioral Approaches –** to divide the market according to how people behave, their attitudes or the benefits they seek.

- **Volume Approaches –** to distinguish heavy, medium, light or nonusers of a product category and, after determining the profitability of the product and whether its users differ in some special way, focus product sales on the right volume target. For example, marketing programs focused on business users are a response to volume segmentation.

- **Business Specialization Approaches -** to categorize the market by type or size of industry or institution. This form of segmentation applies primarily to business or institutional markets.

To sum it all, segmentation means 'picking your spots', focusing more on business in one part of the market than another to gain a more profitable mix. Success will depend on selecting the right segment and creating an appropriate package with the image, products and services required to meet those needs. This last step creates perceived extra value and institutional distinctiveness in electronic markets.

**2. Create a Coherent Advertising Plan:** he product differentiation plan should carefully lay out the advertising campaign. Online advertising is a form of investment similar to other investments to improve and expand business. The returns depend on the planning and thought that precede the actual commitment and expenditure of advertising. By first developing an effective advertising plan, firms increase the likelihood of a positive return on the advertising investment.

The first step in developing an advertising plan is to *specify advertising goals*. Why are you advertising online? What do you want to achieve? Everyone wants advertising to increase business, but for an advertising plan to work one must be precise. Goals for advertising include increasing awareness of business, attracting competitors' customers, increasing the likelihood of keeping current customers and developing their loyalty, and generating immediate sales or sales leads.

Once advertising goals are determined, *select the target audience* for the message. Successful advertising

is written with a specific customer in mind. Try to picture the customer to reach in order to achieve the advertising goals.

Once target audience and what they are looking for in terms of the product or service offered is known, a firm can decide *what its advertising will say. The* advertising should 'speak' convincingly to the target audience, explaining the important benefits the product or service offers.

**3. Get the Content to the Customer:** Dissemination of information about the company and its products via newsgroups, listservs, and e-mail will constitute a cost-effective method to reach large numbers of individuals in various target audiences. Although on the surface this closely resembles a traditional push strategy, an important difference lies in the ability to build in valuable feedback loops. Alongside this approach, however, a strong pull-based marketing (marketing by invitation, not intrusion) is a more effective method of marketing on the Internet. One of the essential ingredients of pull-based marketing is the skilled management of customer information and their activities on the Internet so that the most responsive customers can be identified through the use of predictive models. These models enables in sending the right message, at the right time, to the right people in the right form.

Feedback loops should be incorporated in the strategy to help continuously drive the marketing program to greater and greater efficiencies and productivity. These loops will capture and store respondent names, response rates to various mailings, and customer activity in terms of access logs of the interactive content stored on the Web page.

**4. Correspond and Interact with Customers:** One of the most powerful features of Internet-facilitated marketing is the variety of potential interactions possible. Among them are four levels of interaction with potential customers:

- **Passive Interaction Via Anonymous FTP Sites -** A broad variety of information about the company, product and other related material can be placed in a public area accessible by any interested party by simply dialing in and using the user name: anonymous, and password: guest. The goal of this well-known method is to provide a channel where the customer is completely unfettered to do as he or she pleases, with no sales pressure.

- **Direct Interaction (one-on-one) Via e-mail or Chat Facility -** The goal of direct interaction is to answer questions, answer requests for more information and follow up on a customer.

- **Group Dialog Between Company and Customers Through Bulletin Boards, Newsgroups, and Other Forums -** The goal of group interaction is to encourage discussion among customers, provide an easy way to answer questions about unanticipated problems that may occur during product usage, and simply build a database of long-term, experience-based knowledge about the product and its usage. To do this, a Usenet news group for discussion of products is created. By creating one's own forum, moderating the submissions (filtering out irrelevant postings) and providing high-quality information, not only about the products but about the particular commercial sector, one can establish a growing readership in much the same way that newsstand magazines function.

- **Video Conferencing on the Internet using the Multicast Backbone (MBone) facility** where several distributed parties can actively participate and monitor product-related activities. MBone allows the digital broadcast of live audio, video and text with interaction among the participants through a common whiteboard. MBone is a relatively new tool and shows the potential of digital video broadcasts to subscribing audiences.

**5. Learn from Customers:** One part of learning is evaluation. A real-world test of the marketing plan will

provide estimates of marketing-plan productivity, suggestions for improving its productivity and a disaster check. The market provides measures of consumers' responses to those elements that have been pretested, the product, the price, and the communication plan. It also measures the acceptance of these measures. By measuring levels of consumer awareness, product trial, repeat purchase, market share, and sales volume, the market gives some indication of the productivity of the elements of the marketing plan.

The information regarding the tracking of accesses to the company's materials over the Internet can be compared with any tangible results obtained through other channels (inquiries, contacts with distributors, end sales, references in literature). This analysis will be used to determine how the company's promotional and marketing strategy and materials can be altered to better suit the needs of the target groups they are reaching as well as to determine how best to reach the target groups not yet responding.

**6. Provide Customer Service and Support:** Online customer service is an essential part of the electronic commerce chain, where people are more in touch with one another than in any other type of market. This has both good and bad consequences. Word about a new product from a small company can spread quickly and widely if there is excitement; conversely, problems can be reported with equal speed and breadth. Thus companies must be constantly on their toes when it comes to customer service.

When problems confound users, good vendors know the support they provide must run the gamut of phone, fax, CD-ROM, third-party and online services. Online services can include bulletin boards and knowledge bases provided directly by the vendor, public forums or special interest groups (SIGs) on commercial services or newsgroups, and archives on the Internet. Increasingly, however, vendors and users alike are turning to online support over other options for a variety of reasons. Going online may seem impersonal, but it's often less hassle than phoning up a technician who may or may not be there, explaining the problem to a voice-mail machine, providing documentation for the symptoms and then waiting for a reply. Brand loyalty through customer service needs to be cultivated among online customers so that they can come back for repeat purchases. Loyalty and service quality are often interrelated.

Clearly, marketing strategies and processes must undergo significant modifications to succeed online. Both marketing personnel and the IS people who support their activities will have learn about each other's skills to achieve the results that their organization desires.

## 5.9 Market Research

Market research is extremely important for companies in terms of how they allocate their advertising dollars in sales promotions, how they introduce new products, how they target new markets.

Broadly marketing research is divided into three faces:

**Data Collection:** Markets mainly rely on source database for understanding consumer behavior. Source data base mainly comprises of numeric information. Delivery of source database services follows two main patterns:

Data collect and collate data, making it available by data base producers.

Data collect and collate data, making it available by central hosts like CompuServe, American online, etc.

**Data Organization:** Everyone is collecting data from electronic commerce, but very few are organizing it effectively for developing a marketing strategy. The key abilities in their environment are:

Leverage its established database into customized offerings by audience and markets.

Leverage its established database in terms of horizontal growth.

**Data Analysis and Sense Making:** The ability to link database to analytic tools like econometric programs and forecasting models is called data analysis. Market research is undergoing major changes; the next generation of source database will definitely include multimedia information.

## 5.10 Consumer Search and Resource Discovery

**Search and Resource Discovery Paradigms**

Three information search and resource discovery paradigms are in use:

Information search and retrieval

Electronic directories and catalogues

Information filtering

**Information Search and Retrieval:** Search and retrieval begins when a user provides a description of the information being to an automated discovery system. Using the knowledge of the environment, the system attempts to locate the information that matches the given description. An information retrieval method depends on the libraries. The challenge is to develop users in domains such as electronic shopping. Search and retrieval methods, which refine queries through various computing techniques such as nearest neighbors, the variants of original query.

**Electronic Directories and Catalogues:** Information organizing and browsing is accomplished using directories or catalogues. Organizing refers to how to interrelate information, by placing it in some hierarchy. Maintaining large amount of data is difficult.

**Information Filtering**: Goal of information filtering if selecting of data that is relevant, manageable and understandable. Filters are of two types

1. Local filter: Local filters work on incoming data to a PC, such as news feeds.

2. Remote filter: Remote filters are often software agents that work on behalf of the user and roam around the network from one data base to another.

**Consumer Search and Resource Discovery Paradigms**

Information Search and Retrieval

Electronic Commerce Catalogues or Directories

Information Filtering

**Information Search and Retrieval:** Information search is sifting through large volumes of information to find some target information. Search & retrieval system are designed for unstructured & semi structural data. The process of searching can be divided into two types:

**The end-user Retrieval Phases:** consists of three steps:

First, the user formulates a text based query to search data.

Second is, the server interprets users query, performs the search and returns the user a list of documents.

Third is, the user selects documents from the hit list and browses them, reading and perhaps printing selected portions of retrieved data.

**The Publisher Indexing Phase:** It consists of entering documents in to the system and creating indexes

and pointers to facilitate subsequent searches. The process of loading a document and updating indexes is normally not a concern to the user. These two phases are highly interdependent

**WAIS (Wide Area Information Service)**: It enables users to search the content of the files for any string of text that they supply.

WAIS has three elements: Client, Sever, Indexer

It uses an English language query front end a large assortment of data bases that contains text based documents. It allows users to search the full text of all the documents on the server. Users on different platforms can access personal, company, and published information from one interface i.e. text, picture, voice, or formatted document. Anyone can use this system because it uses natural language questions to find relevant documents. Then the servers take the user questions and do their best to find relevant documents. Then WAIS returns a list of documents from those users. Today, the Netscape or NCSA mosaic browser with the forms capability is often used as a front-end to talk to WIAS sever.

**Search Engines**: WAIS is a sophisticated search engine. The purpose of the search engine in any indexing system is simple, to find every item that matches a query, no matter where it is located in the file system. Search engines are now being designed to go beyond simple, broadband Searches for which WIAS is so popular. It uses both keywords and information searching to rank the relevance of each document. Other approaches to data searching on the web or on other wide area networks are available.

**Indexing methods**: To accomplish accuracy and conserve disk space, two types of indexing methods are used by search engines. They are:

1. File-level indexing: It associates each indexed word with a list of all files in which that word appear at least once. It does not carry any information about the location of words within the file.

2. Word-level indexing: It is more sophisticated and stores the location of each instance of the word. The disadvantage of the word-level indexing is that all the extra information they contain gobbles up a lot of disk space, it is 35-100 percent of the original data.

**Search and new data types**: The following search technologies are used for effective search:

**Hypertext:** richly interwoven links among items in displays allow users to move in relatively ad hoc sequences from display to display with in multimedia.

**Sound:** speech input and output, music and wide variety of acoustic cues include realistic sounds that supplement and replace visual communication.

**Video**: analog are digital video input from multiple media, including video tapes, CD-ROM, incorporated broadcast videos turners, cables and satellites.

**Electronic Commerce Catalogs or Directories:** A directory performs an essential support function that guides customers in a maze of options by enabling the organizations of the information space.

Directories are of two types:

1. The white pages
2. Yellow pages

The white pages are for people or institutions and yellow pages are for consumers and organizations.

**Electronic White Pages:** Analogues to the telephone white pages, the electronic white pages provide

services from a static listing of e-mail addresses to directory assistance. White pages directories, also found within organizations, are integral to work efficiency. The problems facing organizations are similar to the problems facing individuals.

**Information Filtering:** Information Filtering System is a system that removes redundant or unwanted information from an information stream using (semi)automated or computerized methods prior to presentation to a human user. Its main goal is the management of the information overload and increment of the semantic signal-to-noise ratio. To do this the user's profile is compared to some reference characteristics. A notable application can be found in the field of email spam filters. Thus, it is not only the information explosion that necessitates some form of filters, but also inadvertently or maliciously introduced pseudo- information.

On the presentation level, information filtering takes the form of user-preferences-based newsfeeds, etc. Recommender systems are active information filtering systems that attempt to present to the user information items (movies, music, books, news, webpage) the user is interested in. Information filtering describes a variety of processes involving the delivery of information to people who need it. This technology is needed as the rapid accumulation of information in electronic databases. Information filtering is needed in e-mails, multimedia distributed system and electronic office documents.

The features of the information filtering are:

Filtering systems involves large amounts of data (gigabits of text).

Filtering typically involves streams of incoming data, either being broadcast by remote sources or sent directly by other sources like e-mails.

Filtering has also been used to describe the process of accessing and retrieving information from remote database.

Filtering is based on descriptions of individual or group information preferences, often called profiles. Filtering system deal primarily with textual information.

**Email Filtering:** It is the processing of e-mail to organize it according to specified criteria. Most often this refers to the automatic processing of incoming messages, but the term also applies to the intervention of human intelligence in addition to anti-spam techniques, and to outgoing emails as well as those being received. Email filtering software inputs email. For its output, it might pass the message through unchanged for delivery to the user's mailbox, redirect the message for delivery elsewhere, or even throw the message away. Some mail filters are able to edit messages during processing. Common uses for mail filters include removal of spam and of computer viruses. A less common use is to inspecting outgoing e-mail at some companies to ensure that employees comply with appropriate laws. Users might also employ a mail filter to prioritize messages, and to sort them into folders based on subject matter or other criteria

**Mail-filtering Agents:** Users of mailing-filtering agents can instruct them to watch for items of interest in e-mail in-boxes, on-line news services, electronic discussion forums, and the like. The mail agent will pull the relevant information and put it in the users personalized newspapers at predetermined intervals. Example of Apple's Apple Search software. Mail filters can be installed by the user, either as separate programs (see links below), or as part of their e-mail program (*e-mail client*).

In e-mail programs, users can make personal, 'manual' filters that then automatically filter mail according to the chosen criteria. Most e-mail programs now also have an automatic spam filtering function. Internet service providers can also install mail filters in their mail transfer agents as a service to all of their customers. Corporations often use them to protect their employees and their information technology assets.

**News-filtering Agents**: These deliver real-time on-line news. Users can indicate topics of interest, and the agent will alert them to news stories on those topics as they appear on the newswire. Users can also create personalized news clipping reports by selecting from news services. Consumers can retrieve their news from through the delivery channel of their choice like fax, e-mail, www page, or lotus notes platform.

## 5.11 Summary

E-marketing means using technologies to help sell goods or services. E-marketing has evolved with time, thanks to internet which brought about a revolution. The history of e-marketing can be credited to websites, emails and search engines like Google. The advantages of e-marketing are reduction in cost, faster response, increased measurability of data, global audience, instant purchase functionalities etc. E-marketing plan represents a sub-set of organizations overall marketing plan. It involves stages like identying audience, understanding customer, setting the objectives, plan tactics and agreeing on a budget. Situation analysis is designed to take a snapshot of where things stand at a time plan is presented. In today's world of fast-paced business, due to technological advancement, the customer is well informed and takes fast decisions too. Therefore e-marketing has become a very important framework where marketers can showcase their products and services through internet advertising, which is highly cost effective. Marketer may market their products and services by charting the marketing the process, speedy market research, customized consumer research and resource discovery mechanism.

## 5.12 Self Assessment Questions

1. Define e-marketing and explain e-marketing planning in detail.
2. Discuss the increasing practices of information based marketing.
3. How the advertising is done on the internet? Explain.
4. What do you understand by consumer search and resource discovery? Explain.

## 5.13 Reference Books


- Stauss, Judy, and Frost, Raymond, 2005. E-marketing, Pearson, Prentice Hall, New Jeresy.
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# Unit - 6 : Business to Customer e- Commerce

**Structure of Unit:**



## 6.0 Objectives

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

- Understanding the concept of e-Commerce transaction
- To study the Types of Ecommerce transactions
- To understand concept of Business to Consumer
- To study the various models of B2C transaction

## 6.1 Introduction

Business often lease to adoption of new technology and a new methods of operation. The use of information technology into the business has resulted in new business applications. New technologies present business and entrepreneur with the new ways of organizing production and transacting business. New technologies are giving opportunity to thousands of new company to start up and to understand real meaning of e commerce one need to first understand some of the business concept which include nature of electronic market, transaction, information goods, business models, business value chain, consumer behavior etc. electronic commerce commonly known as e-commerce or eCommerce, consists of the buying and selling of products or services over electronic systems such as the Internet and other computer networks. Electronic commerce can be defined as any form of business transaction in which the parties interact electronically. A transaction in an electronic market represents a number of interactions between parties. It could involve several trading steps, such as marketing, ordering, payment, and support for delivery. An electronic market allows participating sellers and buyers to exchange goods and services with the support of information technology. The interaction between participants is supported by electronic trade processes that are basically search, valuation, payment and settlement, logistics and authentication. The amount of trade conducted electronically has grown extraordinarily with widespread Internet usage.

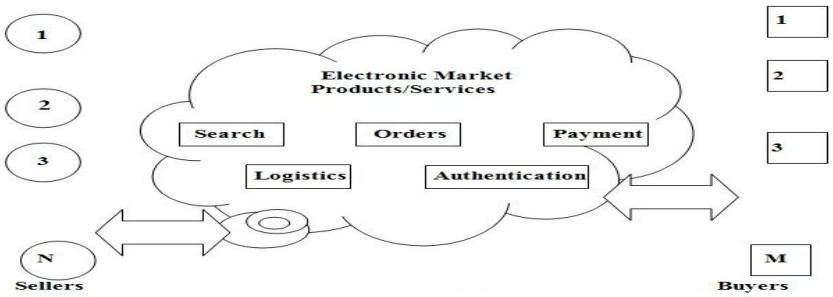



**Figure - 6.1 : Representation of e-Commerce.**

In all, e-commerce can be described as the use of the Internet and the web to transact business. More formally, digitally enabled commercial transactions between and among organizations and individuals. On the other hand, e-business can be described as the digital enablement of transactions and process within a firm, involving information systems under the control of the firm. Moreover, e-business applications turn into e-commerce precisely when an exchange of value occurs. A transaction is an exchange of values such as purchase a sell or conversion of raw material into finished product. By recording transaction one can help business owners to keep record of their business activity, scores and measure how well they are performing these activity. All transaction involves at least one activity, some transaction may involves many activity.

The various activity of the business and transaction results in classification of ecommerce. The group of logical, related, sequential activities and transaction in which business engage are often called business processes. Transfer of funds placing and reviewing orders sending and receiving invoices shipping goods are some of the activities or transaction perform in the business for example in the business process of shipping products to customer might include a number of activity like inspecting the product, packing the goods, negotiating with courier company to deliver the product, creation and painting of delivery document, loading of product, payment to courier company.

## 6.2 Types of e-Commerce Transactions

E-commerce is the use of Internet and the web to transact business but when we focus on digitally enabled commercial transactions between and among organizations and individuals involving information systems under the control of the firm it takes the form of e-business.

There are mainly seven types of e-commerce transactions:

### 6.2.1 Business to Consumer (B2C)

As the name suggests, it is the model involving businesses and consumers. This is the most common e-commerce segment. In this model, online businesses sell to individual consumers. When B2C started, it had a small share in the market but after 1995 its growth was exponential. The basic concept behind this type is that the online retailers and marketers can sell their products to the online consumer by using crystal clear data which is made available via various online marketing tools. E.g. An online pharmacy giving free medical consultation and selling medicines to patients is following B2C model. Some of the sites in this category are amazon.com, dell.comebay.com and websites of all the banks offering services to their customers etc. Here we have to note that one website can have multiple models.

### 6.2.2 Business to Business (B2B)

It is the largest form of e-commerce involving business of trillions of dollars. In this form, the buyers and sellers are both business entities and do not involve an individual consumer. It is like the manufacturer supplying goods to the retailer or wholesaler. E.g. Dell sells computers and other related accessories online but it is does not manufacture all those products. So, in order to sell those products, it first purchases them from different businesses i.e. the manufacturers of those products. Of the site which provide B2B model are ebay.com, esteels.com, interaction at payment gateway, electronic clearing house etc

### 6.2.3 Consumer to Consumer (C2C)

It facilitates the online transaction of goods or services between two people. The interaction will be carryout between two end users. Though there is no visible intermediary involved but the parties cannot carry out the transactions without the platform which is provided by the online market maker such as eBay. Some of the example for this category are kabadibazar.com,all the job site such as naukari.com, all the matrimonial site such as jeevansaathi.com etc.

### 6.2.4 Government-to-Business (G2B)

The government-to-business category covers all transactions between companies/ business and government organizations. It includes government electronic procurements and other government to business communications and vise versa. In addition to public procurement, government organizations may also offer the option of electronic transactions such as payment of corporate taxes. Some of the site in this category are filling of sale tax, all the tenders these days also appear electronically on government site, auction of the products etc.

### 6.2.5 Government-to-Citizens (G2C)

The government-to-citizens category covers electronic interactions between citizens and government. This model is very popular in areas such as welfare payments and file of income tax returns (efileing), payment of taxes of local governing body such as property tax, water tax etc.

### 6.2.6. Government to Government (G2G)

This category of transaction occurs when two government/ agencies/ international agencies interact with each other. In many states of India we have electronic treasury (eTreasury) for efficient and effective disbursement of funds.

### 6.2.7 Peer to Peer (P2P)

Though it is an e-commerce model but it is more than that. It is a technology in itself which helps people to directly share computer files and computer resources without having to go through a central web server. To use this, both sides need to install the required software so that they can communicate on the common platform. This type of e-commerce has quite low revenue generation as from the beginning it has been inclined to the free usage due to which it sometimes got entangled in cyber laws. Some of the example in this category are napster.com, mymusic.com etc

| | Business | Consumer | Government |
|---|---|---|---|
| Business | B2B<br>(Transactions) | B2C<br>(Business Transaction) | B2G<br>(Procurement) |
| Consumer | C2B<br>(Price Comparison) | C2C<br>(Auction) | C2G<br>(Tax) |
| Government | G2B<br>(Information) | G2C<br>(Information) | G2G<br>(Coordination) |

**Figure – 6.2 : Framework of e-Commerce Transaction**

It is not necessary that these transactions are dedicatedly followed in all the online business. It may be the case that a business is using them as per its needs. It is worth to mention that a business transaction and business model are two separate entities where transaction talks about interacting parties an model talks about the way business activities are perform to result profit in market place.

The business model provide broad prospective necessary for identify appropriate solution for various level of business activity. The solution should be sustainable in terms of revenue generation and should be capable of attending business objective. A business model describe the set of activities, entities and their relationship in a business. It's also describe the sources of revenue and potential benefits accruing to the various business participants

| Transaction Type | E-business Model |
|---|---|
| Business to Consumer (B2C) | e-shops, e-mall, e-auction, classified, portal, e-tailer, subscription, infomediaries, manufacturer model, service provider model etc. |
| Business to Business (B2B) | e-auction, infomediaries, e-procurement, e-distribution, portal, communities, third party market place, value chain service provider, affiliates, collaborative platform etc. |
| Consumer to Consumer (C2C) | e-auction, virtual communities etc |

**Figure - 6.3 : e-Business Model in Various Transaction**

A business model can be defined as the organization of product, service and information flow with respect to sources of revenue and benefits for suppliers and customer. A business model adopted by an organization as a framework of maximizing values in the competitive environment. An e-business model is the adoption of organizational business model with the leverage of internet. The success of any business model depends on its ability to address factors like value proposition, revenue model, market opportunity, competitive environment, competitive advantage, market strategy, organizational development and management team as given in table.

**Activity A :**

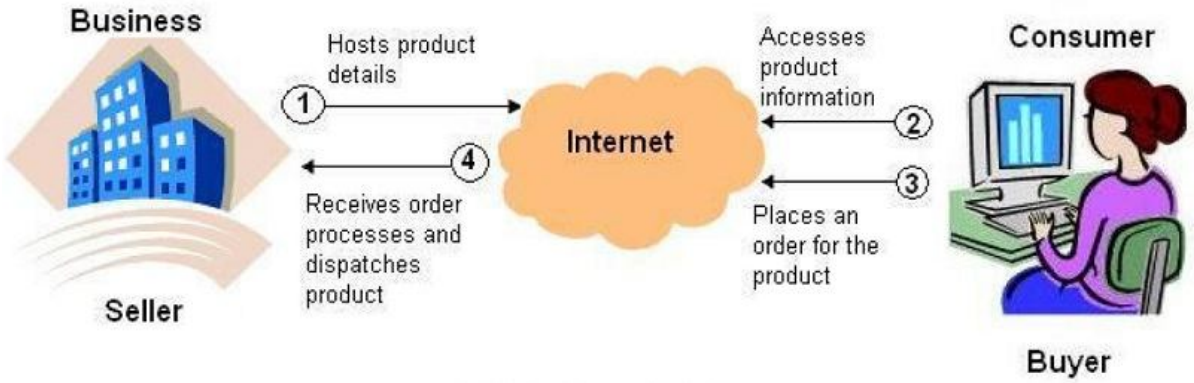
1. Search on the internet and select a website for all the e-commerce transaction discussed above

## 6.3 Business to Consumer e-commerce Transactions

The primary category of classifying e-commerce on the basis of participating entities is business to consumer. Businesses when interact with end user consumer results in this category of transaction for example business sales product and services to individual consumer. A bank provide a facility of net banking to its customer fall in this particular category. amazon.com the largest retailer dealing in books and other items is in this particular category.

The B2C transactions as shown in figure represent transactions between business organizations and consumers. It applies to all the business organization that offer there product and services to its consumer over the Internet. These sites gives profile of the product information, particulars through catalog and store it in a database. The some of the example in this category includes online banking, travel services, and health information etc.

Consider a hypothetical example in which a transaction is conducted between a business organization and a consumer. A business organization, ABC Store, displays and sells a range of products on their Web site, www.abc.com. The details information of all their products is contained in the huge catalogs maintained by ABC Stores. Now, a consumer, Dinesh, wants to buy a gift for his wife. He therefore, logs on to the site of ABC Stores and selects a gift from the catalog. He also gets the detailed information about the gift such as, the price, availability, discounts, and so on from their catalog. Finally, when he decides to buy the gift, he places an order for the gift on their Web site. To place an order, he needs to specify his personal and credit card information on www.abc.com. This information is then validated by ABC Store and stored in their database. On verification of the information the order is processed. Therefore, as you can see, the B2C involves transactions between a consumer and one or more business organizations.




The example of the www.amazon.com site also involves the B2C model in which the consumer searches for a book on their site and places an order, if required. This implies that a complete business solution might be an integration solution of more than one business model. For example, www.amazon.com includes the B2B model in which the publishers transact with Amazon and the B2C model in which an individual consumer transact with the business organization.

The B2C transaction of e-commerce is more prone to the security threats because individual consumers provide their credit card and personal information on the site of a business organization. In addition, the consumer might doubt that his information is secured and used effectively by the business organization. This is the main reason why the B2C model is not very widely accepted. Therefore, it becomes very essential for the business organizations to provide robust security mechanisms that can guarantee a consumer for securing his information.

**Activity B :**

1. On internet select a B2C company of your choice and list the various products sold on the website.

## 6.4 Business model used in B2C

B2C ecommerce in which business organization seek to reach individual consumer uses variety of e-business model as shown in figure

| Business Model | Variations | Examples | Description | Revenue is generated through |
|---|---|---|---|---|
| Portal | Horizontal/ General | Google.com<br>Yahoo.com<br>AOL.com<br>MSN.com | Offers an integrated package of services and content such as search, news, e-mail, chat, music downloads, video streaming and calendars. Seeks to be a user's home base | Advertising, subscription fees, transaction fees. |
| | Vertical / Specialized(Vortal) | moneycontrol.com | Offers services and products to specialized market space | Advertising, subscription fees, transaction fees |
| E-tailer | Virtual Merchant | Amazon.com | Online version of retailer can shop at any hour of the day or night without leaving home or office | Sales of goods |
| | Clicks and Mortar | Walmart.com | Online distribution channel for company that also has physical stores. | Sales of goods |
| | Catalog merchant | LandsEnd.com | Online version of direct mail catalog | Sales of goods |
| | Online Mall | Fashionmall.com | Online version of mall | Sales of goods, transaction fees |
| | Manufacturer direct | Dell.com | Online sales made directly by manufacturer | Sales of goods |
| Content Provider | | dainikbhaskar.com,<br>epatrika.com,<br>CNN.com<br>NDTV.com | Information and entertainment providers such as newspapers, sports sites, and other online sources that offer customers up to date news and special interest, how to guidance, and tips and/or information sales | Advertising, subscription fees, affiliate referral fees |
| Transaction Broker | | E-Trade.com<br>Expedia.com<br>Monster.com | Processors of online sales transactions, such as stock brokers and travel agents, that increase customers productivity by helping them get things done faster and more cheaply | Transaction fees |
| Market Creator | Auctions and other forms of dynamic pricing | eBay.com<br>baazi.com<br>olx.com | Web-based business that use internet technology to create markets that bring buyers and sellers together. | Transaction fees |
| Service Provider | | xDrive.com<br>whatsitworthtoyou.com<br>myCFO.com | Companies that make money by selling users a service, rather than a product | Sales of services |
| Community Provider | | About.com<br>iVillage.com<br>BlackPlanet.com<br>Facebook | Sites where individuals with particular interest, hobbies, and common experiences can come together and compare notes | Advertising, subscription, affiliate referral fees |

**Activity C :**

1. Search on internet list websites performing business using business model discussed above.

### 6.4.1 Portal Business Model

Portals are a website which offers integrated package of content and services for example email, instant messaging, search, advertisement, video streaming, shopping, music, calendar, games etc. Some of the example of portal are AOL.com, yahoo.com, google.com, msn.com. The high volume of traffic makes it attractive to advertisers and generate income for the portal owners. There is great completion for website traffic and consumer are invariable offered number of incentive to choose a particular portal and remain it for the future use. Portals do not sell anything directly but use as a tool for attracting people for variety of paid services. Portal generate revenue from charging advertiser for placing their advertisement, collecting referral fees for guiding customers to other site and charging for premium services.

Vortal are verticals portal, specialized portal that is design and developed to attract a particular specialized market segments. for example moneycontrol.com is a vortal developed to provide a service in the area of financial market. Vortal may be setup to attract traffic from user with similar interest, experiences or similar habits. The success of vortal is determine by the ability to attract well define user rather than volume of traffic. This is of particular interest to advertiser who want to address more specific target audience with specialized message and this will result premium charges to the owner.

**Activity D :**

1. Search a portal of your choice and list the services offered to a user on that portal.

### 6.4.2 E-Tailers (Online Retail Stores)

Online retail store called retailers are very popular in B2C category the joint book shop amazon.com, Walmart, fashion mall, Dell are some of the example in this category they offer variety of business variants like virtual merchant like click and mortar, like catalog merchant direct selling etc. They work in virtual market without any ties to physical location in order to serve customers. Some of the players has appointed some intermediate player to serve their customers on their behalf. E-tailers have several key advantages over their counter parts in conventional market places. One of the most important advantage is that a well design consumer portal can deliver multiple revenue opportunity through selling of product, supply in house, co-marketing and selling product from competitors and delivering targeted advertising,

E-tailer can established an upper hand over conventional retailers by providing a consumer portal that enables it to reach new customer without investing in costly new retails outlets. Amazon.com is a one of the largest book store developed in nineties offers various benefits to its customer. Like greater selection, conveyances is of use, information search and retrieval capabilities, ease of access from multiple location, competitive pricing, price comparison capabilities and personalization. The key component of amazon offering includes browsing, searching, reviews and content, recommendation and personalization, one click technology for fast checkout service, secure credit card payment, availability and fulfillment interactivity with other customer and high level of customer service. These offering has resulted amazon.com to become first mover in the etailing sector an was able to built a brand name that quickly become recognized in key market.

The acceptance of retailing in the area of book amazon has expanded its services to other area which includes video, CDs, gift, toy, healthcare product, gardening tools, electronic and digital products etc. amazon has developed corporate partnership with various portals, internet service providers and internet marketing companies to extend its reach ability.

Some of the activity which are included in common e-tailers are discussed below:

**1. Catalog Management**: Catalog is a detailed list of goods and services available on the website. It includes photographs, description, specification, size, colour etc in the form of database. E-tailers must integrate product and service information from multiple vendor in to a signal comprehensive catalog that is simple to navigate and present products in a attracted maaner.

**2. Parametric Search:** Customer often search for the product categories (Bathing Soap) rather than product name (Lux or Dove). Parametric searching allows a buyer with the capability of searching product category incrementally to determine product selection that is specifically as per their need.

**3. Personalization (Profiling):** Consumer site should identify visitors uniquely wherever possible in order to collect personal information of individual about the type of product they search their liking and ultimate buy along with their overall surfing behavior on the site.

**4. Advertising and Targeted Marketing**: If we utilize the interest and buying habits of visitors known to us effectively with the help of advertisement and promotional banner. E-tailers can dramatically increase the instance of impulse buying. The use of targeted emails and special promotion schemes can increase traffic on the e-tailrs site.

**5. Shipping Cart:** -tailers must provide a facility of virtual shopping cart that allow a customer to collect and manage product of their interest before actually checking out. This will enable a retailer to know about the liking of the customer.

**6. Payment Processing:** The site must include variety of form of payment processing to enable user to make purchases using credit card, online payment method and payment voucher etc.

**Activity E** :

1. Search on the internet and find out the performance of amazone.com since its inception.

### 6.4.3 Content provider

Information content is one of the critical applications of internet which provide information as required by the user. This comes under the all type of intellectual property which refers to all form of human expression that can be put into a tangible medium like CD, text or web. Content provider distribute information content like news, music, photo, art work, video over the internet and the user has to pay for the content which he had used. The revenue is generated through advertisement, membership fee or affiliated fee. To generate subscription a business organization has to offer high value content to the user. A majority of the website do not run subscription basis because of omni presence of information and the low switching cost for customers. If one organization offered content by subscription only the rival organization could easily offer free access to the same information and operate a different pricing model.

### 6.4.4 Brokerage Model

Brokers are intermediaries who brings buyers and seller together for transaction purpose the largest industry using this model financial services, travel services, job placement services. Some of the example in this category are naukri.com which provide interaction of prospective employee and employer, sharekhan.com which provide share trading between buyer and seller, jeevansathi.com which provide interaction between prospective candidates for marriage, monster.com offer job searcher national market place for their talent and offer employers a national resource for talent both employer and job seeker attracted by the conveyance and currency of information etc. transaction broker charge money each time transaction occur but this money considerable less as compare to traditional broker.

**Market Creator:** Market creator provide a digital platform where buyer and sellers can meet display products search for products and established a price for product. They act as a middle man for the buyer and seller and charge money for their position. Ebay is auction site, create a digital environment for buyer and seller to meet agree on a price and transact. This is different from transaction broker who actually carried out the retranslation for their customer acting as a agent in a larger market it ebay buyer and seller are their own agent. Each sale on ebay net a company a fee.

Bidding and auctioning have been exclusively the domain of niche market where it is difficult to put objective value of the product being sold. Some of the example the established markets for bidding and auctioning include antique and refurbished nobility, custom define product, painting and other art work etc. the dynamic pricing of auctioning help professionals and business organization to get best price for their product and services. The successful bidding and auctioning application must support core functionality in order to provide basic feature and services that customer expect in auction environment. These functionality are discussed below:

**1. Catalog Integration and Management:** As we know that bidding and auctioning involves sell of access supply or unique good from multiple supplier therefore application must maintain a detailed catalog of individual and quantity goods for auction. This will help to integrate new items and new suppliers.

**2. Chat**: The evaluation of product presented in the auction is dynamic and subjective process. The chat facility provided in the bidding and auctioning site allow potential buyer to discuss the relative merit of the product available on the site or any other area of interest.

**3. Bid Board:** A simplified and well place bid board must be made available on the website. So that when ever consumers are ready to place a bid on a product or service they must be able to post their bid information on a public bid board. This will also keep other potential buyer up to date on the auction process.

**4. Notification:** Auction are driven by series of event like new item posted for bidding, new high bid receive, auction open, auction close etc. to ensure that all potential buyer have access to up to date information about the auction. A well define notification component must be included in the website. This notification component will deliver up to date email, sms to the various participating bidders.

The market opportunity for market creator is very vast, it requires financial resources and marketing plan to attract sufficient seller and buyer to the market place.

### 6.4.5 Service Provider

Service provider offer services online intern charge a fee. Some of the service provider also generate revenue through advertisement or by collecting personal information that is useful to direct marketing for example selling of domain name registration and space on server. Some website provide online tips for share trading and charge money. The basic proposition of service provider is that they offer consumer a valuable convenient time saving, low cost alternatives as compare to traditional service provider.

**Activity F** :

1. Surf the website irctc.co.in and list the activity performed on the website.

### 6.4.6 Community provider

Social media has rapidly become an important part of many peoples' lives, not just as a way to keep up to date with friends and family, but also for professional networks, exploring fields of research, shopping,

sharing content and fostering online communities with shared interests. It has also become a crucial aspect of a businesses' online presence; now a firm can connect with consumers and tailor their online relationships with customers, other brands, and with employees.

Community providers are very popular entities these days. Internet has made such a site for like minded individual to meet and converse easily without the limitation of geography. Community providers are the site that creates a digital platform where people of similar interest can transact, communicate with like minded people, receive interest related information. community site like oxygen.com, about.com, makes money through affiliate relationship with retailer and from advertising. According to Robbabenzamin as discussed in blueprint to a digital economing five requirement of successful online community building are:

**1. Shared Space:** In Real world community often tied to some particular geographical location. As internet attract global audience community builder must make efforts to build shared space for the community where members can call their own and identify with the common value of the group. A website can act as shared space on net to build common interest and investment in the community.

**2. Shared Value:** Community members must have some sense of common appreciation and values in order to established a foundation for discussion and productive interaction.

**3. Shared Language:** Language is the way we communicate. Unless we speak same language we can't talk. If we can't talk we are not going to get to much out of each other.

**4. Shared Experience**: Community are based around a common experience which members shared for example geociter, are website which organize customer webpage into community with common topic and similar virtual addresses in order to promote interaction and dialogue between user with similar interest.

**5. Shared Purpose:** Individual visiting a community site must have common purpose, in case of commerce oriented site the purpose is to discover new product, to find out user experience, to make transaction or to provide feedback. If other share these priority discussion are likely to be focused on and engaging.

There are many ecommerce business models currently used in the industry and more are being invented every day. The business organization are using various model in different category of transaction like B2B, B2C, C2C etc. They are also developing new business models and modifying existing business model. It might be possible a business model can be used in one or more transaction area.

## 6.5 The Emerging B2C Application

A key emerging B2C application electronic bill payment where payments for variety of service provider is made through website. The electronic payment allow a customer to organize, keep track of, pay all their bills through a single electronic interface. It also save cost of paper and postages and customer complaint that bills were not delivered correctly and timely, many of the organization provide special discount if payments were made online for example BSNL offers a discount of 1% of bill amount if payment of bill is online.

Social media is another area were many development are possible. Forecasting the changes in the area of digital arena is very difficult, but some of the changes that may occur in the social media in coming years are discussed bellow.

- **Hosted Content:** The coming year will see a massive increase in companies using social media services to market their goods and services, recognizing the potential for sharing content and

information and enhancing engagement with target audiences. Social media services will provide a platform for hosting content and interacting with the audience both as consumers and on a more tailored, personal level. Developments in social media sites and apps will allow companies of all sizes to create engaging, content-rich multimedia interfaces hosted by social media sites.

- **Branded Entertainment:** Advertisers are likely to continue to develop innovative means to embed commercials within content and entertainment as this type of branding replaces more disruptive and blatant forms of advertising. Social media allows advertisers to target consumers, not necessarily in a disruptive, aggressive manner; instead branded entertainment and content provides consumers with information they have a genuine interest in and advertisers can supply relevant content to the people who are most likely to be interested in their products and services.
- **The Growth of Video:** Video is likely to continue to cement its role as the crucial technology in communications, conferencing, information sharing and social media. Advances in mobile networks' capabilities for carrying high-speed, high-quality video streaming will enable much improved video services for mobile-based social media apps.
- The proliferation of social media-enabled smart phones and tablets equipped with high resolution cameras and video apps will further establish video's centrality in social media interfaces.
- **Social TV:** Digital and on-demand TV has had the effect of reducing 'event TV', when people across the country sit down at the same time to watch broadcasts and discuss them at work or school the following day – instead people watch shows on-demand at their own convenience; no bad thing in itself, but as a result TV has become a more atomised, insular experience.
- **Social Shopping:** Social shopping will continue to evolve in future, with consumers coming together for wholesale savings through group e-commerce purchases, sharing shopping experiences, product and retailer recommendations; and the growth in online shopping communities. In many ways these online communities will replicate the dynamics of a traditional local marketplace with discerning customers developing bonds with trusted 'stallholders'.
- **Social Search:** The launch of Google+ in 2011 added a new layer to online searches, providing a social aspect to search results. This human input into search logarithms is likely to increase over the coming year.
- **Social Enterprise and Invention:** Large businesses will learn the benefits of social media and develop their own internal 'social enterprises', linking each member of staff on a personal and professional level. Facebook and Twitter are likely to continue to dominate social media, other innovative sites will emerge as the social media market diversifies. The driving forces behind these trends will continue to be the inventiveness and creativity of the developers who advance social media apps and technologies in new and unexpected direction.

## 6.6 Summary

The present structure of the e-commerce environment has allowed us to understand various concept of business to customer e-commerce. The popularity of internet has given boost to growth of Business to customer e-commerce and Business to Customer Transaction. The various forms of business models used in B2C category where studied.

## 6.7 Self Assessment Questions

1. Discuss the working of business to consumer e-commerce transaction.
2. Discuss the types of e-commerce transaction.
3. Explain business model used in B2C e-commerce.
4. What are the advantages of B2C e-commerce to individual.
5. How B2C e-commerce can help business organization in India

6 What are the various aspect which can influence B2C e-commerce in India.

## 6.8 Reference Books


- Electronic Commerce Framework Technology an application, Bharat Bhaskar, Publication 2003, McGrawhill
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- E-Commerce Management, Krishnamurthy S,2002, Himaliya Publication
- E-Commerce Business Technology, Laudon Kenneth C, 2006, Pearson Education
- E-Commerce, Diwan Parag, 2000, Excel Book
- Introduction of e-business, Colin Combe, Elsvier

# Unit - 7 : Business to Business e-Commerce

**Structure of Unit:**



## 7.0 Objectives

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

- To define Business to Business E-commerce transaction
- To understand underlying concept for B2B transaction
- Various models of B2B transaction
- To understand various market forces for B2B e-commerce
- To understand success of B2B e-commerce
- To identify technology involved in B2B e-commerce

## 7.1 Introduction

The growth information technology and internet has increase the flow of information across the geography. The business potential of the situation has been use by many organizations. In seventy organizations has started transferring information and using databases across the physical boundary which has resulted in fast and efficient system of business process. This process popularly known as business to business e-commerce transaction which involves transaction with thousand of corer rupee money value.

## 7.2 Business to Business e-Commerce Transaction

Business to business e-commerce transactions are between the businesses, such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer or between manufacturer and benders or suppliers etc. In the B2B e-commerce transaction the total number of transaction are much higher than the total number of B2C e-commerce transactions. For example, an automobile manufacturer makes several B2B e-commerce transactions to procure basic raw material from various sources such as components, parts, rubber, oil, buying tires, glass for windscreens, and rubber hoses for its vehicles etc. After production of the automobile the manufacturer interact with dealers, sub-dealers in order to provide products to the end user and subsequently makes follow up to check after sales services. where as in B2C category only the final transaction occurs i.e. A finished vehicle is sold to the consumer, is a single (B2C) transaction. B2B e-commerce also includes many types of financial transactions between companies, such as insurance, commercial credit and electronic networks for trading bonds, securities and other financial assets transaction between the banks, insurances, insurance company etc.

The B2B e-commerce transaction involves electronic transactions within the organizations i.e. inter-organizational business processes that includes manufacturers, Logistics Company, warehouses, distributors,

suppliers, retailers etc to facilitate orders, order processing, generation, execution and fulfillment etc. It includes trading of raw material, goods and services, such as business subscriptions, professional services, manufacturing, and wholesale dealings. Sometimes in the B2B e-commerce transaction occurs between, business may exist between virtual companies, neither of which may have any physical existence. In such cases, business is conducted only through the Internet

B2B e-commerce concept can better understand with the following example Toko Company sells automobile parts and another company Jugar Company assembles these parts and after assembly finisher product is soled to end user customer. Jugar Company comes across the Web site of Toko and finds that the profile and work of the Toko suitable for their business activity. Therefore Jugar after preliminary talk and negotiation decide to purchase automobile parts from Toko. To perform various transaction pertaining to procurement of raw material, Purchase order, schedules, delivery challen, delivery status, payment etc. Jugar and Toko make use of Website. After Toko receives the order details, it validates the information and as soon as the order is confirmed shipments details along with delivery challans are sent to Jugar followed by payment settlement is also done electronically.

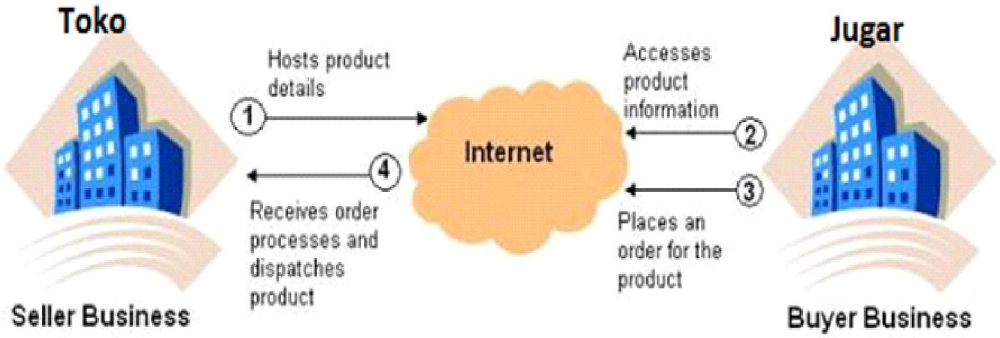


**Figure – 7.1**

B2B is dominated by long term, symbiotic buyer supplier business partnership relationship where stack holder collectively work for common interest such as lower cost and improved product and service offering. Business-to-Business e-commerce Transactions can be based on variety of technological involvement. Some of the important technology and concept are discussed below.

**Activity A :**

1. Search on the internet identify and list five website performing Business to Business e-commerce Transaction.

### 7.2.1 Electronic Data Interchange (EDI)

In this businesses interact with other organization using a technology which involves computer-to-computer communication. Because of this fast machine to machine communication with less involvement of human make it fast, economical and dependable way to conduct business transactions. Business-to-business transactions include the use of EDI and electronic mail for purchasing goods and services, buying information and consulting services, submitting requests for proposals, and receiving proposals.

Electronic data interchange (EDI) is essential activity in the arena of B2B e-commerce transaction. EDI helps business organizations in caring out their activities without human involvement. Electronic data interchange (EDI) can be defined as the structured transmission of data between organizations by electronic means. It is used to transfer electronic documents or business data from one computer system to another computer system, i.e. from one trading partner to another trading partner without human intervention as shown in

figure 7.2. the information flow using EDI indicate that the mail services has been replace with the data communication of EDI network and flow of paper within the buyer and vendors organization have been replaced with the computer running EDI software. Not only this payment procedure is also accomplish by involving banks of buyer and vendors using EDI software.

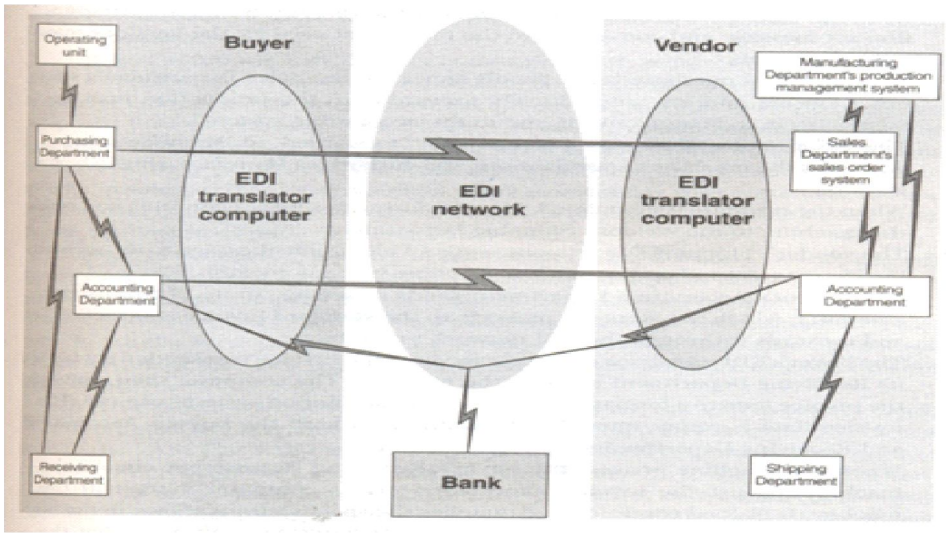


**Figure 7.2 : Information flow in B2B e-Commerce Using EDI**

EDI implies a sequence of messages between two parties, either of whom may serve as originator or recipient. The formatted data representing the documents may be transmitted from originator to recipient via telecommunications. The transfer of structured data, by agreed message standards, from one computer system to another without human intervention. In the present era of technologies such as XML web services, the Internet and the World Wide Web, EDI may be the data format used by the vast majority of electronic commerce transactions in the world. It is more than mere e-mail; for instance, organizations might replace bills of lading and even cheques with appropriate EDI messages. Some of the standard for EDI are UN/ EDIFACT, ANSI X12.

**Benefits of EDI to Business organization:** EDI was developed to solve the problems inherent in paper-based transaction processing and in other forms of electronic communication. In solving these problems, EDI is a tool that enables organizations to reengineer information flows and business processes. Problems with the paper-based transaction system are:

- **Time Delays:** Delays are caused primarily by two factors. Paper documents may take days to transport from one location to another. In addition, manual processing delays are caused by the need to key, file, retrieve, and compare data.
- **Labor Costs:** In non-EDI systems, manual processing is required for data keying, document storing and retrieving, sorting, matching, reconciling, envelope stuffing, stamping, signing, etc. While automated equipment can help with some of these processes, most managers will agree that labor costs for document processing represents a significant proportion of their overhead. In general, labor-based processes are much more expensive than non-labor-intensive operations involving computers and telecommunications.
- **Errors:** Because information is keyed multiple times and documents are transported, stored, and retrieved by people, non-EDI systems tend to be error prone.
- **Uncertainty:** Uncertainty exists in two areas. First, paper transportation and other manual processing delays mean that the time the document is received is uncertain. Once a transaction is sent, the

sender does not know when the transaction will be received nor when it will be processed. Second, the sender does not even know whether the transaction has been received at all nor whether the receiver agrees with what was sent in the transaction.

- **High Inventories:** Because of time delays and uncertainties in non EDI processing, inventories are often higher than necessary. Lead times with paper processing are long. In a manufacturing firm, it may be virtually impossible to achieve a just-in-time inventory system with the time delays inherent in non-EDI processing systems.
- **Information Access:** EDI permits user access to a vast amount of detailed transaction datan a non-EDI environment this is possible only with great effort and time delay. Because EDI data is already in computer-retrievable form, it is subject to automated processing and analysis. Such information helps one retailer, for example, monitor sales of toys by model, color, and customer zip code. This enables the retailer to respond very quickly to changes in consumer taste.

**Examples of EDI:** The Bergen Brunswig Drug Company, a wholesale pharmaceutical distributor in California, is one of the most successful companies in using EDI for many of its business processes. To generate an order to Bergen Brunswig, a customer (pharmacist) uses a handheld bar code scanner to capture the UPC (Uniform Product Code) number on a shelf label for a product to be ordered. The pharmacist enters the quantity desired into a keypad on the scanner and moves onto the next item. All items in the pharmacy can be scanned in only a few minutes. A microcomputer next reads the information contained in the scanner and an electronic order is prepared for the pharmacist's review. The order is sent via EDI to a Bergen Brunswig distribution center where the order is analyzed and resequenced to match the product location in the distribution center. Within five hours, the order is delivered to the pharmacy. Bergen Brunswig has been able to eliminate all order takers, reduce errors to near zero, fulfill orders faster, reduce overhead costs, and build customer loyalty. The company also uses EDI for sending purchase orders to pharmaceutical manufacturers, receiving invoices, and handling charge backs.

The JCPenney Company has an operating center in Salt Lake City, Utah, which uses EDI to receive almost all of its invoices from suppliers. The result has been substantial savings in terms of personnel costs (four processing centers were combined into one and several hundred people who did manual processing were no longer needed), a reduction in errors, faster matching of invoice and purchase order, more timely payments, and a reduction in paper storage requirements.

**Activity B :**

1. Send a word document i. as an attachment, ii. as a part of email to your friend and check the difference in the document.

### 7.2.2 Supply Chain Management (SCM)

Many business organization are using strategic partnership and alliances to create long term relationship with the other business organization in the supply chain for the product or services they manufacturer or sales for example Walmart has created a network of warehouses and shipment company to provide product and services to the end user. By doing so business organization are able to reduce cost by developing close relationship with supplier rather than negotiating with large number of supplier every time when they need to buy material or supplies. When businesses integrate their supply management and logistics activity between various clear in a particular product's supply chain, this integration is called as supply chain management. The objective of supply chain is to achieve in efficient system which provide high quality and low cost products and services. For example Dell Integrate its suppliers in such a way to offer quality products at reasonable cost to its customers.

Many organizations are also working with zero inventory level by using a integrated system of inventory management with their vendors or suppliers to reduce inventory cost and stock out situation. In recent years business has realize that they can create better product quality and save money by active involvement of suppliers. This is possible by engaging supplier in cooperative, long term relationship, business with common interest and mutual survival in order to identify new ways to provide their own customer with faster, cheaper and better services. And these coordinated efforts of supply chain participant a business organization evolved supply chain management to reach out limits beyond their own organizational capability.

Some of B2B ecommerce supply chains have started using Internet, as online marketplaces, reduce the cost of both supply-chain management and the carrying out of supply-chain functions. A key to the reduced cost is Internet-based which reduces available information that increases the transparency and speed of transactions within the participating business organization. Members of supply chains can quickly and reliably find the specific information they need to complete an exchange of goods or services, and receive rapid payment. Some of the activities includes:

**Procurement:** The Internet reduces the cost of purchases by giving supply-chain partners quick access to information about sources, availability, pricing and technical data. Members of the supply chain must cooperate in making this information available online, possibly in secure folders only accessible to account holders who are supply-chain partners. Once information required to make a purchase is available online from several sources, procurement is more efficient because the best source can be identified more quickly. While the actual prices paid do not necessarily diminish, the cost of the procurement transactions is lower.

**Supply:** On the supply side, the most important role of the Internet is to greatly increase the size of the accessible market. Suppliers using the Internet to market their goods and services can sell world-wide. With the Internet's greater transparency regarding pricing, suppliers have lost some of the strategic levers that allowed them to cultivate preferred accounts with higher margins. The ability of competitive suppliers to achieve greater sales volumes balances this disadvantage. Once the supplier has found a customer, he benefits from similarly reduced transaction costs as the purchaser, because completing the transaction is quicker and more efficient.

**Direct Transactions:** In the supply chains the role of the Internet has been to reduce the power of intermediaries. Therefore, Suppliers can offer their products and services directly to customers, and purchasers can find what they need directly from producers. This disintermediation has simplified supply-chain management by making real time data on changes in demand and supply available to the markets, rather than having the information filtered through re-sellers. This trend has been especially pronounced in B2B transactions, while intermediaries remain more important in retail.

**Collaboration:** The supply-chain management through the Internet is still in its formatives years, the possibilities exist for even closer integration of supply and procurement functions. Suppliers are interested in having a high, predictable sales volume, while purchasers are looking for a reliable, low-cost source. Companies can satisfy both goals by providing data on production and on procurement needs to each other under long term relationships. The resulting high, steady volume allows the supplier to offer his products at lower cost, while the purchaser benefits from this cost reduction and receives a reliable supply.

The advantages which suppliers can achieve using information technology and supply chain management.

- Share information about customer demand

- Share information about defects
- Reduce cost of handling transaction
- Reduce data entry errors
- Increase speed of processing
- Receive notification of product design specification and adjustment
- Provide specification and updation

Dell computer is a classic example to depict use of technology enable supply chain management to give customers product of their choice and specification. Dell reduces the amount of inventory it keeps on hand from three weeks sales to six days sales resulting Dell to develop a system to check inventory levels to be measured in minutes. Dell has achieved this by increase in sharing of amount of information it has about the customers and specification with the members of its supply chain. Dell's top suppliers have access to secure website and database that shows them Dells latest sales forecast along with other information about product changes, defect rates, warranty claims etc. Dells also share information about customer needs and wants. All this information helps their suppliers to plan their production much better way than they could otherwise. As a result all the member of the supply chain work together to reduce inventory, increase quality and to provide high value to the ultimate customer.

**Activity C :**

1. Visit dell.com and list the supply chain activity.

### 7.2.3 Electronic or Virtual Market Places

One of the common application that enable enterprises to sale good and services to other businesses on the net are referred as electronic or virtual market places. Many business organizations believe that ecommerce has provided them an opportunity for businesses to established information platform in major industry. These platform would offer news, research report, analysis of trends, products information etc. resulting in new business opportunity. The portal and vortals (Models use in B2C) model are also applicable in this category. The characteristics of B2B market places are given in figure 7.3 as proposed by Warren Raisch in his book e-market places. The information comes from various sources buyers and sellers etc. classifying into sellers control industry and buyer control industry.

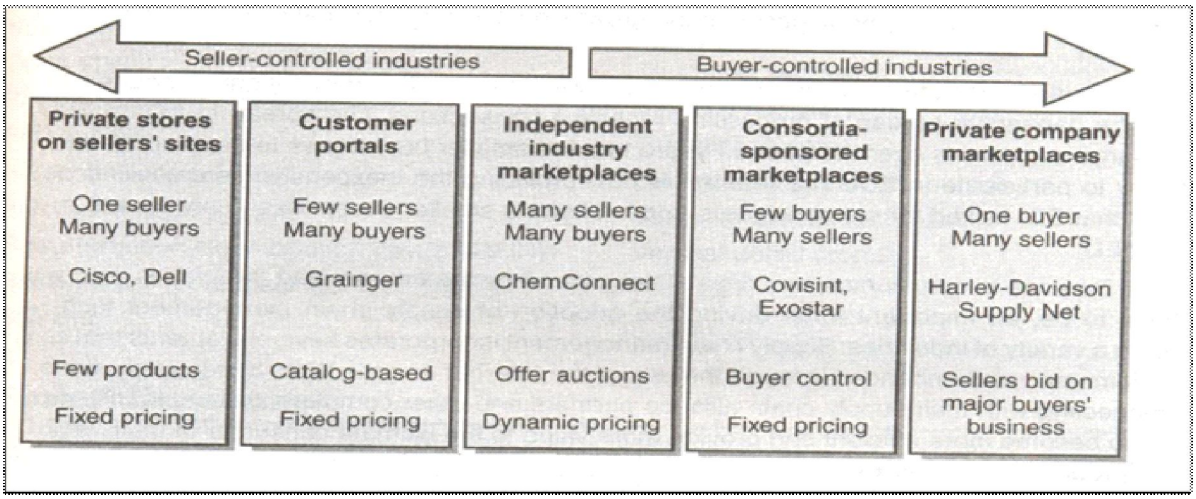


**Figure : 7.3: B2B E-Commerce Transactions In E-Market Place With Their Characteristics**

Virtual market places shares many common features with B2C e-tailer category like online catalog of goods, marketing promotion, payment processing facilities and post sale customer care. The only difference is the buying practices in B2B makes it quit distinct from e-tailer. The virtual market places aimed to increase revenue by decreasing cost while improving the customer buying experience. It is important to mention that a company can offer its product and services in variety of ways. For example Dell offers products other company product on its private store which makes it customer portal then private store. In B2B market place it is more likely that one particular type may dominate the other category. For example third party involvement in booking of e-ticket makes it more popular as compare to i-ticket of Indian railways. It is also believe that variety of market places discussed above will continue to exist.

The variety of application in virtual market place are expected in business environment however certain area are considered to be critical for success of the business model.

#### 7.2.3.1 Catalog Aggregation and Creation

A comprehensive approach for the development of catalog is required to popularize the online catalog with goods and services for the interest of the customer and add values to the customer. This catalog also involves including offering from outside the enterprise to round out product line and provide complete solution. Once the complete product offering are included in the catalog a smooth and consistent interface of the buying process on the website must be provided to the customer. This buying process generally depends on the type of product or services being purchased and catalog functionality. Catalog functionality include variety of activity like simple keyword search, complex product category classification, parametric search, automatic compression of the product and offering, bid bode for collaborative buying, real time chat for negotiating flexible pricing bidding and auction etc.

#### 7.2.3.2 Support for Complex Buying Process

To support wide range of potential buying processes B2B sellers must include a flexible work flow component unlike online selling see/buy/get life cycle of B2C, B2B selling process consist of an number of variation for an number of product and therefore a flexible work flow and application design becomes necessity in virtual market. B2B selling process is developed from the point of the buyer rather than seller when purchasing simple items in a standard configuration and quantity say for example envelop the process is simple see/buy/get. For a product of industrial component a specific process that provide custom built, complex bulk industrial components, the process also oversees the design of the component, a testing phase, forecasting to determine exact short, medium, and long-term demand for the product, and robust bid/ask trading to ensure that the buyer receives the most favorable price possible.

#### 7.2.3.3 Integration with Existing Business System

Virtual market places connect multiple businesses each having different business architecture and buying processes. To provide smooth working within these processes virtual market place must include capability of inter-operability with in the business organization for sharing of information with internal system such as ERP application, corporate databases, custom develop system etc.

#### 7.2.3.4 Support for Multiple Payment System

As we know that in B2B e-commerce payment for purchases are made through corporate cheques or through EFTS. A safe, secure and efficient system become necessity which support variety of payment option. These payment option also keep interest of both the parties and provide low cost reliable payment mechanism with facility of auditing, reconciliation feature and provides safeguard to eliminate the problem of rough and a irresponsible purchasing.

**Activity D :**

1. Search on the internet and list five website performing Business to Business e-commerce Transaction as given in figure 7.3

## 7.3 Business Model for Business to Business E-commerce

In B2B e-commerce various models are used as shown in tables 7.1. in a business you can have more than one business model to fulfill the objective of the business. Experts predict that B2B e-commerce has more potential and value as compare to any other form of e-commerce.

| Business Model | Variations | Examples | Description | Revenue Model |
|---|---|---|---|---|
| Marketplace/ Exchange(B2B Hub) | Vertical | Ebay.com Consultant.in Erpindia.com | Helps bring buyers and sellers together to reduce procurement costs for a specific industry | Transaction fees |
| | Horizontal | Alibaba.com Snapdeal.com Rediffdeal.com | Same as vertical except focused on specific types of products and services | Transaction fees |
| E-Distributor | | Jabbong.com Irctc.co.in | Connecting businesses directly with other businesses, reducing sales cycles and mark-up | Sales of goods |
| B2B Service Provider | Traditional | Employeematters.com Consultant.in | Supports companies through online business services | Sales of services |
| | Application Service Provider (ASP) | Salesforce.com, paymentgateway | Rents Internet-based software applications to businesses | Rental Fees |
| Matchmaker | | Naukri.com Monster.com Shine.com | Helps businesses find what they want and need on the web | Transaction Fees |
| Infomediary | Audience Broker | Doubleclick.net | Gather information about consumers and uses it to help advertisers find the most appropriate audience | Sales of Information |
| | Lead Generator | AutoBytel.com Google.com(sponsored links) | Gathers customer data, and uses it to direct vendors to customers | Referral fee |

**Table - 7.1 : Business Models used in B2B E-commerce**

**Activity E :**

1. Search on the internet and list the website for Business models discussed above.

### 7.3.1 Marketplace/ Exchange (B2B Hub)

Marketplace have generated most of the B2B e-commerce transaction, attention and results in various application. It has potential market size and growth. A marketplace is a digital electronic market where suppliers and purchasers can conduct transaction. It is a place where buyers collect up to date information about supplier their price quality etc at once place. At the same time suppliers gets detailed information about buyers. The benefit of lower sales cost, large number of potential buyer makes it great chances of making a sale. Marketplace also provide less expensive and time consuming process to identify potential supplier/ customer/ partners to perform business. There are two popular category available Horizontal which deals in generalized product and services another is vertical which talks about specific (Specialized) area product and services. Some of the examples are ebay.com, alibaba.com, snapdeal.com etc.

**Activity F :**

1. Visit the website ebay.com and list the five product which are available on the site.

### 7.3.2 e-Distributor

This is a category of B2B application which deals with procurement and resource management. e-distributor are a platform which supplies product and services directly to individual businesses. A largest distributor of maintenance, repair and operation ww.graingir.com started its business activity through catalog in late ninety's very soon the site becomes popular with more than two lakh items. A typical e-distributor is a facility provider to serve many customers. E-distributor brings more product and services on the website to make it more attractive for the potential customer as we know that one stop shopping is always preferable to having visit to various site to locate a particular product and services. For example snapdeal.com provides details of the products, price and companies at one place.

In order to transfer efficiency and cost saving to production and other non standard other supply. Organization are beginning to bring internet trading services and sites. The benefits of the site can be sought if we carefully design following activity

**Manage Long Term Relationship with Suppliers:** Most important supply chain management system enable organization to build and manage a long term relationship with suppliers. These relationships can be liberalized to create and enterprise wide buying environment with favorable condition. The long term relationship results in vendor management system that provide the foundation for potential benefit for developing such application.

**Lower Requisition Cost:** The SCM allow us to automating the internal requisitioning process buying organization can reduce personnel cost and time inefficiency which are normally associated with legacy system.

**Reduce Supplier Cost:** Integration with internal suppliers inventory management and accounting system reduces supplier cost. This help business organization to pass on savings down to the buying organization in the form of highly competitive prices.

**Shorter Cycle Time / Reduce Inventory:** The automation of work flow facility in procurement and distribution application allow a buying organization to reduce the cycle time of purchases, decrease inventory requirement resulting in lowering inventory management cost. The integration of software allows supplier and distributor information about internal inventory status making inventory management 100% vendor control and managed. Whenever new supply are required vendor investigate, process and deliver order automatically to replenish inventory system.

**Optimize Purchases:** One of the key benefit of e-distribution system is to allow purchasing authority to monitor and analyze purchasing data in order to optimize order quantity and activity with restricted suppliers. A single most effective technique for reducing buying cost is collaborative buying where multiple department or multiple businesses can work together to meet sourcing needs and negotiate special pricing.

### 7.3.3 Service Provider

Service provider sales business services to other business organization such as accounting, financial services, human resource, booking etc. for example irctc.co.in provide services to other business organization like yatra.com or makemytrip.com some of the other example are jabbong.com which provide it services to multiple business units. Bookmyshow is a service provider to book ticket for PVR and Inox.

**Activity G :**

1. Visit the website bookmyshow.com and check the difference of procedure and price of the ticket.

### 7.3.4 Matchmaker

Matchmaker are the businesses that generate money by providing matching of businesses and takes a cut of revenue that occurs in performing transaction for example naukri.com or shine.com which provide matching of skills and requirement in the business organization and generate money.

### 7.3.5 Infomediary

Infomediary is a company whose business activity is based on acquiring customer information and selling it to other business. These days, because of privacy and confidentially as described in IT act 2000, the model is not very popular. But some modification is being introduce where various business are helped to identify and locate prospective customer through referral links and sharing of customer profiles not the identities. For example google shares visitors profile and provide referral links on the website.

## 7.4 Future of Business to Business Transactions

A large number of people are heading their way towards online transactions, the B2B ecommerce are becoming more advanced as a result they are easily accessible to all. Various websites are being designed with special features like shopping cart facility, payment gateway, etc. so as to provide comfort to the users and more business. B2B markets are gaining importance day by day. Like any other market even B2B market witness ups and downs. The B2B market trend showed a decline till 2005. After that the graph of progress started significantly and is continuing to rise steadily. Many marketing efforts are made every year in order to pace up with the changing times. The B2B market analysts study the market trends carefully in order to present a true picture of the current status of the market. On the basis of which they give suggestions and predictions of the future trends.

**Following are the few predictions that have been made about the future trends in the B2B e-Commerce transaction:**

- Will enable the suppliers to find new potential buyers and vice versa
- Will help in reducing the cost and time of interaction for B2B transactions
- Trade between far-away geographies will increase
- Management of payments for B2B transactions
- Easier browsing of B2B sites

With the advancing of time the trends in the B2B transaction markets will keep changing for the betterment. Time is not far when even the small scale businesses will have their promotional websites online.

## 7.5 Summary

The present structure of the e-commerce environment has allowed us to understand various concept of business to business e-commerce. The use of electronic data interchange, supply chain, electronic market places has given boost to growth of Business to Business e-commerce.

Business to business or B2B is a term commonly used to describe electronic commerce transaction between business to business. i.e., business to other groups. This is also meant that all transactions made in an industry are also included in this category. It is primarily refers that, large online platforms or websites that facilitate interaction and transactions between buyers and suppliers at organizational level rather than individual

levels. B2B initiative needs a large infrastructure and a company would need to restructure its system and business processes. It involves many participants with complex rules, higher purchasing amount and complex products.

The various model used in business to business where studied. Market places where supplier and commercial purchaser perform a transaction. A market place may be generalized in nature dealing in all the product and services called horizontal whereas dealing in specialized is called vertical market place, e-distributor supply product directly to the individual businesses, service provider sells services to other businesses. Matchmaker provide a link among the businesses by charging fee.

## 7.6 Self Assessment Question

1. Discuss the concept of business to business e-commerce
2. What are the technology used in B2B e-commerce
3. Explain business model used in B2B e-commerce
4. What are the advantages of B2B e-commerce to a Business
5. How B2B e-commerce can help business organization in India
6. What are the various aspect which can influence B2B e-commerce

## 7.7 Reference Book


- Electronic Commerce Framework Technology an application, Bharat Bhaskar, Publication 2003, McGrawhill
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- E-Commerce, Diwan Parag, 2000, Excel Book
- Introduction of e-business, Colin Combe, Elsvier

# Unit - 8 : Internet Protocol

**Structure of Unit:**



## 8.0 Objectives

After completing this unit, you would be able to:

- Understand the computer networking;
- Internet protocols;
- OSI Model;
- Inter Networking;
- TCP/IP Layering;
- ISP and their issues.

## 8.1 Introduction

A network can be defined as two or more computers connected together in such a way that they can share resources. The purpose of a network is to share resources A resource may be:

- A file
- A folder
- A printer
- A disk drive
- Or just about anything else that exists on a computer.

A network is simply a collection of computers or other hardware devices that are connected together, either physically or logically, using special hardware and software, to allow them to exchange information and cooperate. Networking is the term that describes the processes involved in designing, implementing, upgrading, managing and otherwise working with networks and network technologies.

Advantages of networking

- Connectivity and Communication
- Data Sharing
- Hardware Sharing

- Internet Access
- Internet Access Sharing
- Data Security and Management
- Performance Enhancement and Balancing
- Entertainment

The Disadvantages (Costs) of Networking

- Network Hardware, Software and Setup Costs
- Hardware and Software Management and Administration Costs
- Undesirable Sharing
- Illegal or Undesirable Behavior
- Data Security Concerns

**Network Classifications:**

**Local Area Networks (LANs):**

- A local area network (LAN) is a computer network covering a small geographic area, like a home, office, or group of buildings.

**Wide Area Networks (WANs):**

- **Wide Area Network (WAN)** is a computer network that covers a broad area (i.e., any network whose communications links cross metropolitan, regional, or national boundaries). Or, less formally, a network that uses routers and public communications links
- The largest and most well-known example of a WAN is the Internet.
- WANs are used to connect LANs and other types of networks together, so that users and computers in one location can communicate with users and computers in other locations

**Metropolitan Area Network (MAN):**

- A metropolitan area network (MAN) is a network that interconnects users with computer resources in a geographic area or region larger than that covered by even a large local area network (LAN) but smaller than the area covered by a wide area network (WAN). The term is applied to the interconnection of networks in a city into a single larger network (which may then also offer efficient connection to a wide area network). It is also used to mean the interconnection of several local area networks by bridging them with backbone lines. The latter usage is also sometimes referred to as a campus network.

**Intranet and Internet**

- **Intranet:** An intranet is a private network that is contained within an enterprise. It may consist of many interlinked local area networks and also use leased lines in the wide area network.
- **An intranet uses TCP/IP, HTTP,** and other Internet protocols and in general looks like a private version of the Internet. With tunneling, companies can send private messages through the public network, using the public network with special encryption/decryption and other security safeguards to connect one part of their intranet to another.
- **Internet:** is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers).

## 8.2 Internet Protocol

### 8.2.1 What is a Protocol?

A protocol is a set of rules that governs the communications between computers on a network. In order for two computers to talk to each other, they must be speaking the same language. Many different types of network protocols and standards are required to ensure that your computer (no matter which operating system, network card, or application you are using) can communicate with another computer located on the next desk or half-way around the world.

A network protocol or computer communication protocol is a set of rules that specify the format and meaning of messages exchanged between computers across a network

- Format is sometimes called syntax
- Meaning is sometimes called semantics

Computer communication across a network is a very hard problem Complexity requires multiple protocols, each of which manages a part of the problem May be simple or complex; must all work together A set of related protocols that are designed for compatibility is called a protocol suite

- Protocol suite designers:
  - Analyze communication problem
  - Divide problems into subproblems
  - Design a protocol for each subproblem
- A well-designed protocol suite
  - Is efficient and effective - solves the problem without redundancy and makes best use of network capacity
- Allows replacement of individual protocols without changes to other protocols

**Layered Protocol Design:** Layering model is a solution to the problem of complexity in network protocols Model suggests dividing the network protocol into layers, each of which solves part of the network communication problem These layers have several constraints, which ease the design problem Network protocol designed to have a protocol or protocols for each layer

Some of major protocols are :

- Ethernet (Physical/Data Link Layers)
- IP/IPX (Network Layer)
- TCP/SPX (Transport Layer)
- HTTP, FTP, Telnet, SMTP, and DNS(combined Session/Presentation/Application Layers)

### 8.2.2 OSI Model

**Definition:** The OSI model defines internetworking in terms of a vertical stack of seven layers. The upper layers of the OSI model represent software that implements network services like encryption and connection management. The lower layers of the OSI model implement more primitive, hardware-oriented functions like routing, addressing, and flow control

In the OSI model, data communication starts with the top layer at the sending side, travels down the OSI model stack to the bottom layer, then traverses the network connection to the bottom layer on the receiving side, and up its OSI model stack.

The Open Systems Interconnection (OSI) reference model has been an essential element of computer network design since its ratification in 1984. The OSI is an abstract model of how network protocols and equipment should communicate and work together (interoperate).

The OSI model is a technology standard maintained by the International Standards Organization (ISO). Although today's technologies do not fully conform to the standard, it remains a useful introduction to the study of network architecture.

**The OSI Model Stack:** The OSI model divides the complex task of computer-to-computer communications, traditionally called internetworking, into a series of stages known as layers. Layers in the OSI model are ordered from lowest level to highest. Together, these layers comprise the OSI stack. The stack contains seven layers in two groups:

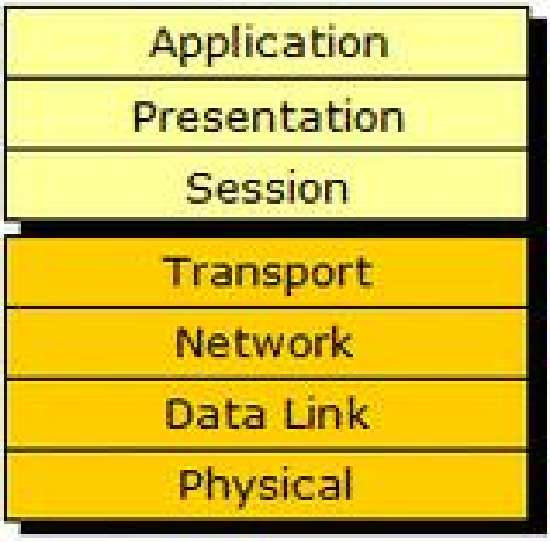


**Figure -8.1 : OSI Medel Stack**

**Upper layers -**
7. application
6. presentation
5. session

**Lower layers -**
4. transport
3. network
2. data link
1. physical

**Upper Layers of the OSI Model:** OSI designates the application, presentation, and session stages of the stack as the upper layers. Generally speaking, software in these layers performs application-specific functions like data formatting, encryption, and connection management.

Examples of upper layer technologies in the OSI model are HTTP, SSL and NFS.

**Lower Layers of the OSI Model:** The remaining lower layers of the OSI model provide more primitive network-specific functions like routing, addressing, and flow control. Examples of lower layer technologies in the OSI model are TCP, IP, and Ethernet.

OSI Model

| | Data unit | Layer | Function |
|---|---|---|---|
| Host layers | Data | 7. Application | Network process to application |
| | | 6. Presentation | Data representation, encryption and decryption, convert machine dependent data to machine independent data |
| | | 5. Session | Interhost communication, managing sessions between applications |
| | Segments | 4. Transport | End-to-end connections, reliability and flow control |
| Media layers | Packet/Datagram | 3. Network | Path determination and logical addressing |
| | Frame | 2. Data link | Physical addressing |
| | Bit | 1. Physical | Media, signal and binary transmission |

**Figure - 8.2 : Layer Model**

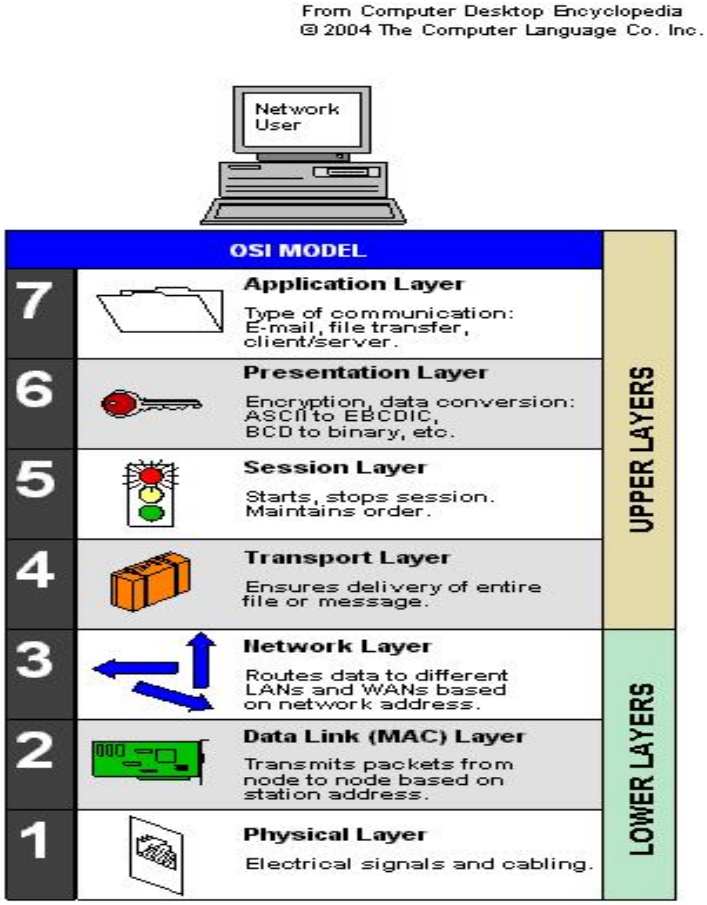


**Figure - 3 : Complete OSI Layers Definition**

### 8.2.3 OSI Layer Definitions

**Layer 1: Physical Layer:** The hardware layer of the model. On SPARC(TM) systems, it consists of the connector to the network transmission medium, any multiplexor boxes, and cables.

**Layer 2: Data Link Layer:** Does the sending and receiving. On the sending end, Ethernet (or similar) software organizes the data into packets of appropriate size and packages them. The packaging includes the physical address of the intended receiver. The layer also transmits the message packets and retransmits them if needed.

On the receiving end, the Ethernet hardware recognizes packets with its address and receives them. The Ethernet software strips the transmission packaging and reassembles the data. It can detect transmission errors.

**Layer 3: Network Layer:** Does the message routing, including translation from logical to physical addresses. The Internet Protocol (IP) is the normal network layer for SPARC systems.

**Layer 4: Transport Layer:** Controls the flow of data on the network. In SunOS 5.8, any of the Transport Layer Interface (TLI), the Transmission Control Protocol (TCP), or the User Datagram Protocol (UDP) can be used. In SPARC systems, connection mode service is typically provided through TCP, and connectionless service is typically provided through UDP.

**Layer 5: Session Layer:** Manages reliable sessions between processes. Remote Procedure Calls (RPC) belong at this layer. The interface at this layer allows remote communication using function call semantics.

**Layer 6: Presentation Layer:** Performs the translation between the data representation local to the computer and the processor-independent format that is sent across the network. In the SunOS 5.8 environment, the processor-independent data format is XDR.

**Layer 7: Application Layer:** At this top layer are the user-level programs and services. Examples of user-level programs are telnet, rlogin, ftp, and yppasswd. Examples of services are NFSTM, NIS, and DNS.

Industry standards have been or are being defined for each layer of the reference model. Two standards are defined for each layer: one specifies the interface to the services provided by the layer, and the other specifies the protocol observed by the services in the layer. Users of a service interface standard should be able to ignore the protocol and any other implementation details of the layer.

### 8.2.4 Benefits of the OSI Model

By separating the network communications into logical smaller pieces, the OSI model simplifies how network protocols are designed. The OSI model was designed to ensure different types of equipment (such as network adapters, hubs, and routers) would all be compatible even if built by different manufacturers. A product from one network equipment vendor that implements OSI Layer 2 functionality, for example, will be much more likely to interoperate with another vendor's OSI Layer 3 product because both vendors are following the same model.

The OSI model also makes network designs more extensible as new protocols and other network services are generally easier to add to a layered architecture than to a monolithic one.

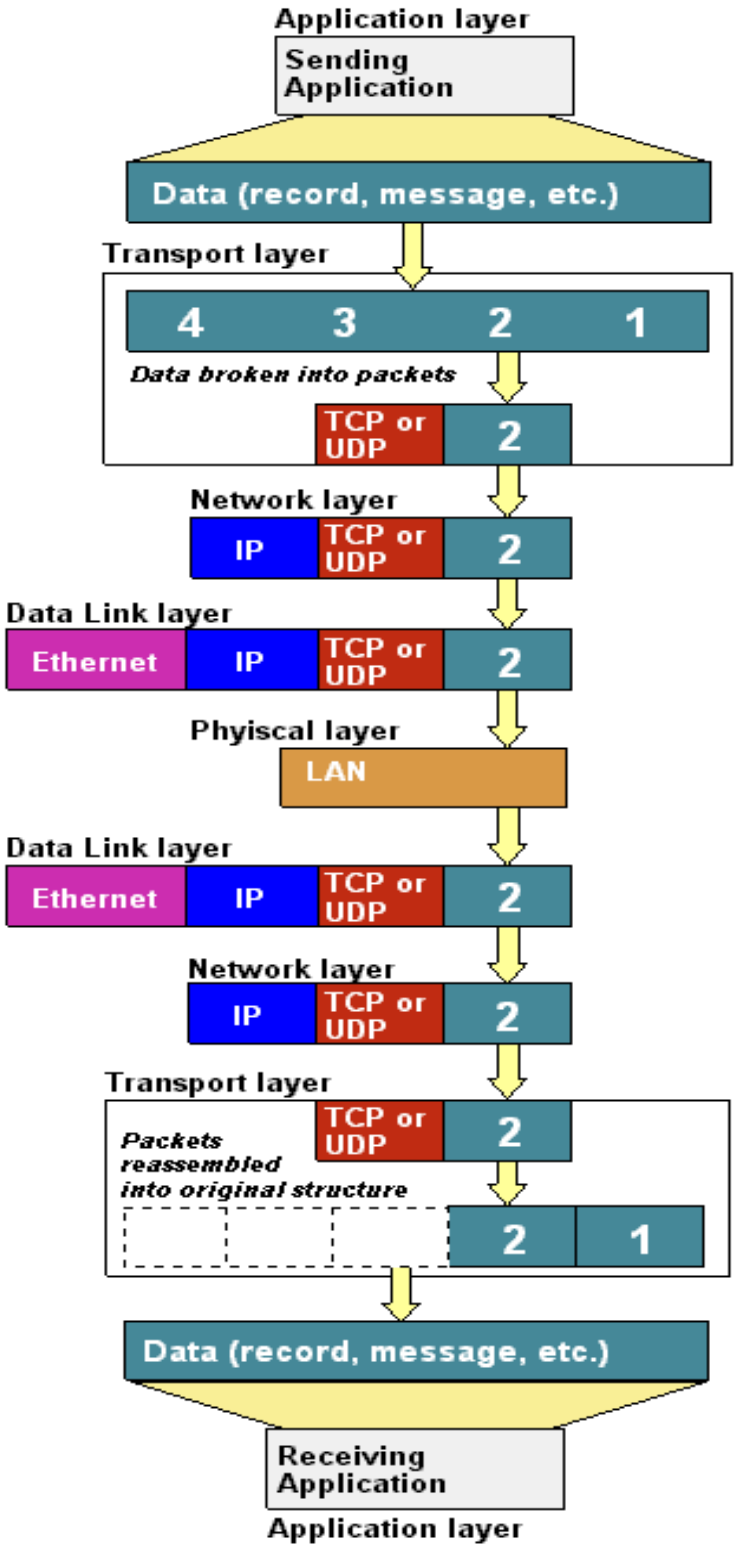


**Figure - 8.4 : Layer's Communication**

### 8.2.5 TCP/IP Layering

A program identifies the program it wishes to communicate with by its socket, which is a combination of (1) the server's IP address and (2) the program's port. If it does not know the IP address, but knows the server by name, it uses a Domain Name System server (DNS server) to turn the name into the IP address. In Windows networks, a Windows Internet Name System server (WINS server) is used to map NetBIOS names, which are assigned to many Windows machines in small networks, to IP addresses.

The port is a logical number assigned to every application. For FTP, SMTP, HTTP (Web) and other common applications, there are agreed-upon numbers known as "well-known ports." For example, HTTP applications on the Web are on port 80, so a Web server is located by its IP address and port 80. An organization's internal client/server applications are given arbitrary ports for their own purposes.

**OSI Layers 5, 6 & 7 Are All in the Top Layer:** OSI Layers 5, 6 and 7 are all included in TCP/IP's Application Layer. For example, OSI Layer 6 (Presentation Layer) is where data conversion (ASCII to EBCDIC, floating point to binary, etc.) and encryption/decryption are performed. OSI Layer 5 is the Session Layer, which is performed in Layer 4 in TCP/IP. Thus we jump from Layer 7 down to Layer 4.



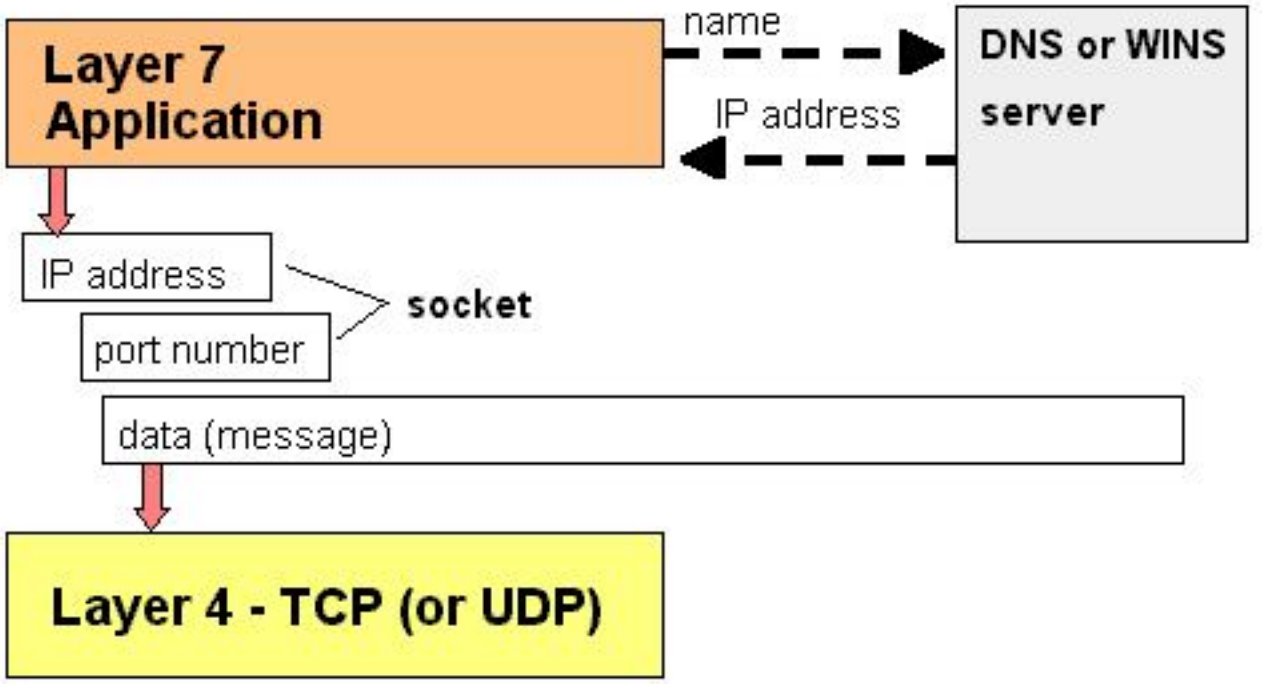


**Figure : 8.5 From Application to Transport Layer**

The application delivers its data to the communications system by passing a stream of data bytes to the transport layer along with the socket of the destination machine. The dotted lines in this diagram are conceptual. DNS and WINS requests go down the stack (in a UDP packet) like everything else in order to go out onto the network.

**Transport Layer 4 - TCP & UDP:** TCP establishes a connection at both ends, creating a "virtual connection" between the two machines before any data can be transmitted. Once established, both sides negotiate the maximum size of a TCP packet. Although TCP supports packets up to 64KB, in most cases, the size will be based on the underlying network, such as Ethernet, which can hold a maximum of 1518 bytes. Token Ring and FDDI support larger frames. TCP attaches a header onto the packet that contains the source and destination ports as well as the sequence number of the packet, and it hands it over to IP along with the destination IP address. (A TCP packet is technically a Protocol Data Unit or segment, but is more often called a packet in common parlance.)

**The Sliding Window:** TCP uses a sliding window system, which is an adjustable buffer that allows a number of packets to be received before an acknowledgment is sent back. The size of the window can be changed as conditions change, and TCP handles this "flow control" in real time. It also handles the retransmission of packets that have been received with errors.

**UDP (User Datagram Protocol):** UDP is an alternative to TCP that does not establish a connection, makes no guarantees and provides no flow control or error detection. Either it does not matter as would be the case for real-time audio or video, or the application programs using UDP must themselves include the error detection and recovery that TCP provides.

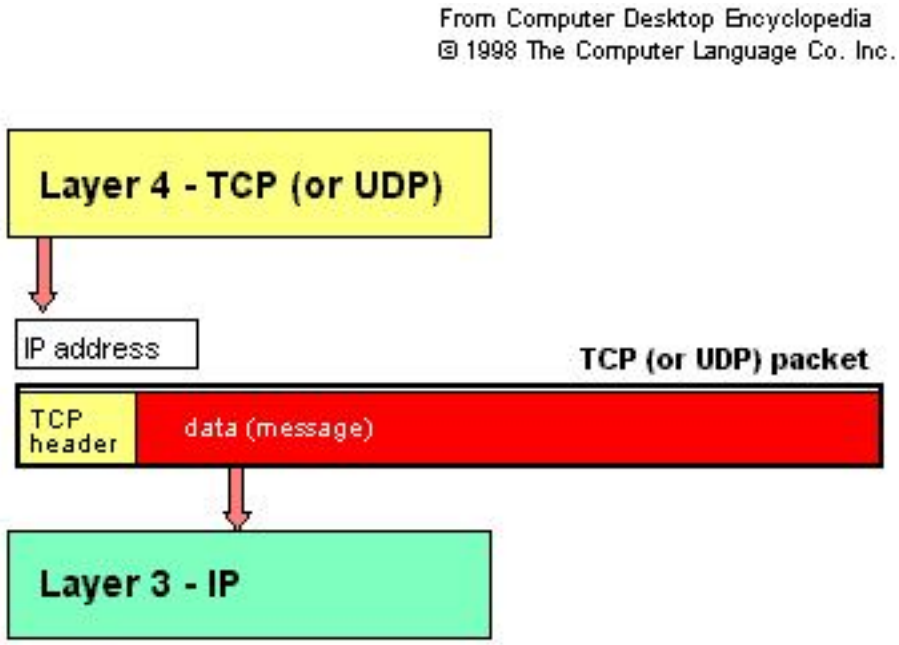


**Figure - 6 : From Transport to Network Layer**

TCP and UDP hand over their packets to IP along with the IP address of the destination node. The packet size is typically the size of the underlying data link layer such as Ethernet or Token Ring.

**Network (Internet) Layer 3 - IP:** The IP protocol accepts the packets from TCP or UDP and prepares them for the Data Link Layer below by turning the IP addresses into physical station addresses (MAC addresses) and fragmenting the packets (if necessary) into the required frame size. IP uses the ARP (Address Resolution Protocol) to obtain the MAC address, unless (1) the address has already been ARP'd and is in the cache or (2) there is a predefined configuration file that contains the addresses. An ARP request is broadcast onto the network, and the machine with that IP address responds with its MAC address. If the target machine is in a different network or subnetwork than the source machine, IP supplies the target address of the default gateway, which is the router that can direct the packet to the appropriate network.

**Datagrams:** IP outputs packets called "datagrams," and each datagram is prefixed with an IP header that contains source and destination IP addresses. If IP has to fragment the packet further, it creates multiple datagrams with sequence numbers so that they can be reassembled by IP on the other end. IP hands over each datagram to the data link layer below along with the MAC address (Ethernet address) of the target station or router.

**Multicast:** IP supports a very useful feature called "multicast," which allows one message to be delivered to multiple recipients. That means one IP data stream can travel a long, circuitous route before it is fanned out to all the target stations by the last router.

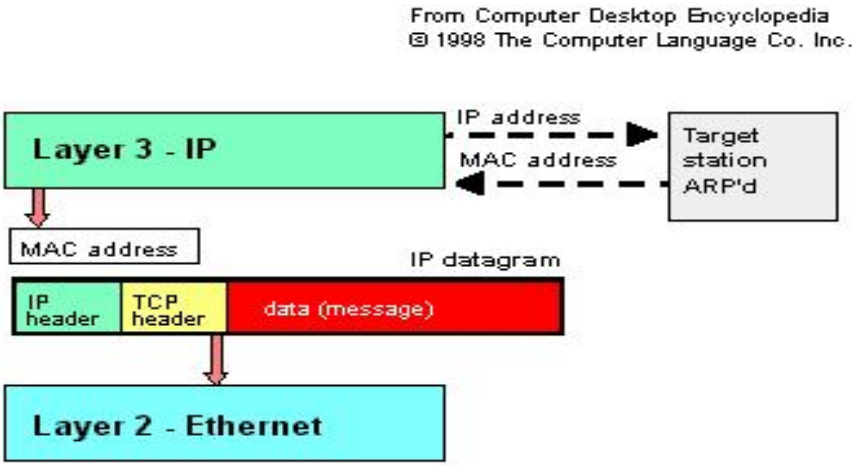


**Figure - 7 : ARP'ing**

The IP protocol broadcasts the IP address of the destination station onto the network, and the node with that address responds.

**IP Is the Routing Mechanism:** In a large enterprise or on the Internet, the IP protocol is used to route the packets from network to network. Routers contain routing tables that move the datagrams to the next "hop," which is either the destination network or another router. Datagrams can traverse several routers within an enterprise and dozens of routers over the Internet.

**Fragmentation:** Routers that span different types of networks may have to fragment the datagrams even further if they direct them onto routes that use a smaller frame size than the incoming frame; for example, from FDDI to Ethernet.

**From Hop to Hop:** Routers inspect only the network portion (netid) of the address and direct the incoming datagrams to the appropriate outgoing port for the next hop. Routers move datagrams from one hop to the next as they are mostly aware of only the devices that are directly connected to them. Eventually, if the routing tables are correctly updated, the datagrams reach their destination. Routers use routing protocols to obtain current routing information about the networks and hosts that are directly connected to them.

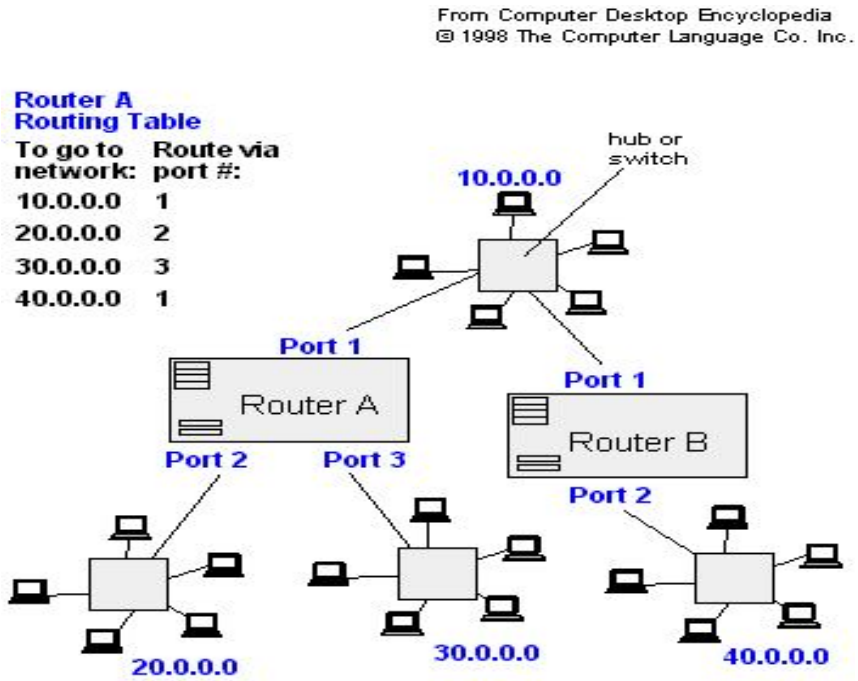


**Figure - 8 : Route Forwarding**

Routing tables hold the data for making forwarding decisions. Although this is a simple example, routing tables become very complex. Static routing uses fixed tables, but dynamic routing uses routing protocols that let routers exchange data with each other.

**Data Link Layer 2 - Ethernet:** IP can connect directly to Ethernet, Token Ring, FDDI, ATM, SONET, X.25, frame relay and other networks. Since Ethernet is the most widely used data link protocol, or network access method, we use it in our example. Ethernet wraps the IP datagrams into its own frame format, which includes a header with source and destination MAC addresses (station addresses) and a trailer that contains checksum data.

**Ethernet Packets Can Collide:** Ethernet uses the CSMA/CD (carrier sense multiple access/collision detection) access method to broadcast the frames onto the wire. If two stations transmit at the same time, their frames collide, and they each back off and wait a random amount of time before trying again (in milliseconds). The data link layer is responsible for reliable node to node transmission. If an Ethernet frame is received with errors, Ethernet handles retransmission until it is received error free.

**LAN to WAN:** If IP datagrams start out in a LAN, go to a wide area network (WAN) and then to a LAN at the other side, the Ethernet LAN frames are converted into WAN frames by a router and back again to Ethernet frames by the router at the other side.

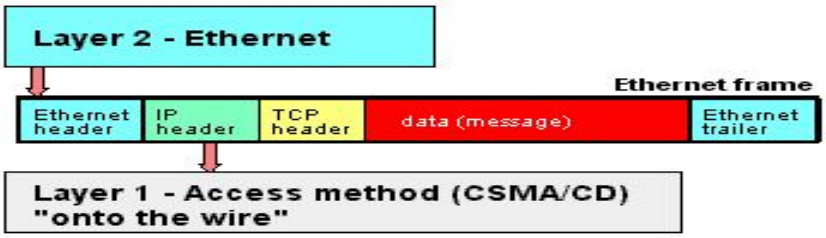


**Figure - 8.9 : Onto the Wire**

The data link layer is responsible for reliable node to node transmission within a subnetwork. When Ethernet frames traverse several routers, the same frames are retransmitted over again by the next router.

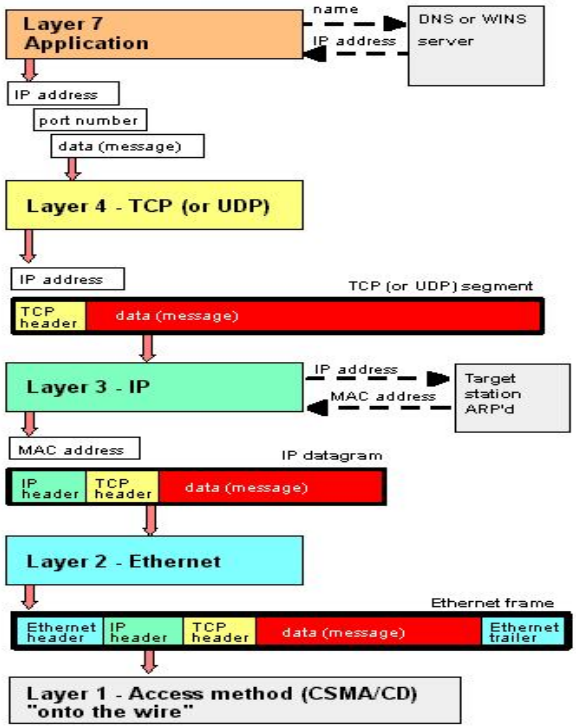


**Figure - 8.8 : Summary of the TCP/IP Stack**

**TCP/IP References:** Perhaps the simplest reference ever written on the subject is "An Introduction to TCP/IP" by John Davidson, published by Springer-Verlag (ISBN 0-387-96651-X). Although written in 1988 and only 80 pages, it is the easiest read on the subject you will ever find.

The Bibles for TCP/IP have been "Internetworking with TCP/IP," Volumes I, II and III, by Douglas E. Comer. Updated to its 5th edition in 2005, Volume I covers, as its subtitle states, the principles, protocols and architecture of the subject. Published by Prentice Hall (ISBN 0-13-187671-6).

## 8.3 Internet Service Provider

### 8.3.1 What is ISP?

An Internet service provider (ISP) is an organization that provides access to the Internet. Access ISPs directly connect clients to the Internet using copper wires, wireless or fiber-optic connections.

Hosting ISPs are a kind of colocation centre that leases server space to smaller businesses and other people.Transit ISPs provide large amounts of bandwidth for connecting hosting ISPs to access ISPs.[

Internet service providers can be either community-owned and non-profit, or privately owned and for-profit.

The Internet started off as a closed network between government research laboratories and relevant parts of universities. As it became more popular, universities and colleges started giving more of their members access to it.

As a result of its popularity, commercial Internet service providers sprang up to offer access to the Internet to anyone willing to pay for the service, mainly to those who missed their university accounts. In 1990, Brookline, Massachusetts-based The World became the first commercial ISP

### 8.3.2 Issues for ISP?

ISPs play a central role in the development of e-commerce and use of the internet. Presently, the majority of people use an ISP to access the internet. The 2005 case of Bunt and Tilley settled the dispute over who is liable for unlawful third party content that passes through an ISP's network. It is now accepted that ISPs have a qualified immunity provided they do not perform an editorial function. Despite this victory, the landscape of e-commerce is continuing to change. It is likely that advances in technology and new user profiling software will expose ISPs to new risks and increase their regulatory burden.

**1. Connectivity:** The main business of an ISP is to provide its customers with a connection to the internet. So far as the customer is concerned, he or she wants to be able to dial into the ISP and get connected without getting an engaged tone. They also want a fast service and will not necessarily recognise that the speed with which they can download information will be governed by their own connection and equipment.

No one can control all of the interconnections between the various networks, and any network failure may be outside the control of the ISP. An ISP needs to make sure that in its terms and conditions it makes it clear that it does not give any guarantee that the service it provides will be uninterrupted or error-free. Where the services are being provided to consumers free of charge or for only a relatively small fee, then such a clause will probably suffice.

When an ISP is hosting a commercial web site and is being paid to do so, its customers will often expect a more comprehensive guarantee in some form of service level agreement. Typically this will be expressed as being the percentage of time which the server on which the web site is hosted will be available for access via the internet.

When considering a service level agreement, it is particularly important to bear in mind two things. First, that allowance should be made for any planned downtime for maintenance of the server which should be excluded from the calculation of the time during which the server is unavailable. Second, it is not possible for anyone to guarantee a 80% connection success rate. However, depending on the period over which the availability is to be calculated, the percentage will most likely be in the range of 98%-99.9%. It is also necessary to consider what "teeth" (if any) the service level agreement is to have. An effective service level agreement will usually contain a provision for a rebate of part of the fees paid to the ISP and the right to terminate the agreement if the service levels are not achieved.

Another big issue for ISP s is that of bandwidth. At the moment bandwidth is very expensive. It is important that in its terms and conditions an ISP limits the amount of bandwidth that its customers can use at any one time. Where an ISP is providing a free service, it will want to be able to restrict the availability of bandwidth for any particular customer. Where a customer is paying an ISP to host its web site, it is essential that the ISP clearly sets out in its agreement how much bandwidth will be available for that customer and reserves the right to charge for any additional bandwidth which is used over and above that provided for in the agreement.

**2. Dealing With Customers:** Most ISP s will have two distinct categories of customers, namely consumer and business customers. In many respects, the issues which arise in relation to each category are the same, although it should be borne in mind that consumers have additional layers of protection under law.

The basis of the relationship for doing business with a customer is contractual. It is important that the customer is made aware of the provisions of the relevant terms and conditions before the ISP begins providing its services. If no terms are agreed with a customer, then it may be possible to imply certain terms into the agreement. However, it is much better for all concerned for there to be certainty as to the terms upon which the services are to be provided.

A typical ISP will need to ensure that it has clear terms and conditions for one or more of the following services:

- Dial-up accounts for consumers (this will often be a free service including the provision of e-mail services and free web hosting);
- Dial-up accounts for businesses;
- Leased line services for businesses; and/or
- Web hosting services for businesses.

An ISP may wish to include terms relating to the e-mail accounts and, in particular, what those accounts can be used for and whether the ISP may remove emails stored on a server from time to time in order to free up space on that server.

**3. Liability for Third Party Content:** ISPs need to ensure that they do not incur liability for any of the material which they host on their servers. There have been a number of cases over the years where third parties have sought to make an ISP liable for material which has been hosted on its server. The case of Bunt and Tilley confirmed that, broadly speaking, an ISP will not be liable if it does not perform any editorial function. If an ISP monitors and removes unlawful material from its sites on its own initiative, then it will run the risk of being seen as a publisher of any material which remains on its servers.

**4. Spam:** Spam is unsolicited commercial e-mail and has become an increasing problem over the years. ISPs claim that it accounts for between 50 and 80 percent of all internet traffic. E-crime using spam has also developed significantly. Attacks have become more sophisticated. The traditional phishing attacks and invitations to visit fake shopping sights which tempt you to enter your bank details have given way to more refined assaults using trojans to install key logger programs or malware on to your computer.

**5. Data Protection:** Data Protection legislation is a particularly important issue for an ISP. As an ISP will inevitably be dealing with personal data, it is essential that it has properly notified the ICO under the DPA, and that it trains its staff to ensure that personal information is kept confidential at all times.

## 8.4 Summary

Network means two or more computers connected together in such a way that they can share resources It is classified as LAN, WAN, Internet, Intranet. Different Computer at different geographical locations uses divers hardware, operating system , applications. It becomes essential to build common agreeable policy to ensure communication a success. In this regard protocol have been designed & decided. Models of internet OSI , TCP/IP described . We have discussed about role of internet protocols. Communication amongst computers over internet. Two models of internet protocol OSI & TCP/IP discussed in detail. ISPs play a central role in the development of e-commerce and use of the internet. Presently, the majority of people use an ISP to access the internet. It is now accepted that ISPs have a qualified immunity provided they do not perform an editorial function. advances in technology and new user profiling software will expose ISPs to new risks and increase their regulatory burden. for ISP s is that of bandwidth. At the moment bandwidth is very expensive. It is important that in its terms and conditions an ISP limits the amount of bandwidth that its customers can use at any one time. Where an ISP is providing a free service, it will want to be able to restrict the availability of bandwidth for any particular customer. Various challenges faced by internet service providers were also described.

## 8.5 Self Assessment Questions

1. Give basic problems of communication between computers in any parts of world.
2. List various communication protocols
3. Describe OSI Model.
4. Explain TCP/IP Model.
5. Give Role of ISP in internet usages
6. What challenges ISP faces.

## 8.6 Reference Books


- Computer Networks Andrew S. Tannanbaum
- TCP/IP by Komer

# Unit - 9 : Website Design

**Structure of Unit:**



## 9.0 Objectives

After completing this unit, you would be able to:

- Understand the B2C E-commerce;
- Benefits to business & customers;
- How B2C is useful through website;
- Strategies for B2C website development ;
- Technologies involve in B2C ecommerce;
- Customer perspective of business over web.

## 9.1 Introduction

**Ecommerce** (**e-commerce**) or **e**lectronic **commerce**, a subset of ebusiness, is the purchasing, selling, and exchanging of goods and services over computer networks (such as the Internet) through which transactions or terms of sale are performed electronically. Contrary to popular belief, ecommerce is not just on the Web. In fact, ecommerce was alive and well in business to business transactions before the Web back in the 70s via EDI (Electronic Data Interchange) through VANs (Value-Added Networks). Ecommerce can be broken into four main categories: B2B, B2C, C2B, and C2C.

- **B2B (Business-to-Business):** Companies doing business with each other such as manufacturers selling to distributors and wholesalers selling to retailers. Pricing is based on quantity of order and is often negotiable.

- **B2C (Business-to-Consumer):** Businesses selling to the general public typically through catalogs utilizing shopping cart software. By dollar volume, B2B takes the prize, however B2C is really what the average Joe has in mind with regards to ecommerce as a whole.

  Having a hard time finding a book? Need to purchase a custom, high-end computer system? How about a first class, all-inclusive trip to a tropical island? With the advent ecommerce, all three things can be purchased literally in minutes without human interaction. Oh how far we've come!

- **C2B (Consumer-to-Business):** A consumer posts his project with a set budget online and within hours companies review the consumer's requirements and bid on the project. The consumer reviews

the bids and selects the company that will complete the project. Elance empowers consumers around the world by providing the meeting ground and platform for such transactions.

- **C2C (Consumer-to-Consumer):** There are many sites offering free classifieds, auctions, and forums where individuals can buy and sell thanks to online payment systems like PayPal where people can send and receive money online with ease. eBay's auction service is a great example of where person-to-person transactions take place everyday since 1995.

Companies using internal networks to offer their employees products and services online—not necessarily online on the Web—are engaging in B2E (Business-to-Employee) ecommerce.

G2G (Government-to-Government), G2E (Government-to-Employee), G2B (Government-to-Business), B2G (Business-to-Government), G2C (Government-to-Citizen), C2G (Citizen-to-Government) are other forms of ecommerce that involve transactions with the government—from procurement to filing taxes to business registrations to renewing licenses.

### 1.2 B2C E-Commerce?

A transaction conducted over the Internet between a business and a consumer. For example, an online publisher may sell a book to a customer, ship it to him/her, and receive payment, all without ever meeting the customer. B2C e-commerce first became common in the 1990s with the popularization of the Internet.

Electronic commerce is in a boom currently. That is not surprising given the fact that the Internet has become a potent venue where products and services can be rolled out these days. While the online media was originally conceived and developed to facilitate information dissemination, many businesses and ventures have struggled and succeeded to turn it into a convenient and bankable trading media. The rise and popularity of B2C e-commerce solutions is a proof of this.

Many online companies and businesses are struggling to secure and use B2C e-commerce solutions. That is not very surprising. Through the years, companies and ventures, which embraced and utilized e-commerce strategies, have been attesting that online presence and operations are very effective and beneficial. If you are starting up your own small-scaled or home-based business, for sure, you are considering securing and using B2C e-commerce solutions for your business.

Why would it be helpful to you if you would use B2C e-commerce solutions? For one, these solutions would provide you and your business the best and most effective options to help promote, advertise, market and operate your startup.

**What are B2C E-commerce Solutions?:** It would be appropriate to first look at what B2C e-commerce solutions are. B2C is short for business-to-consumer, in contrast with the equally popular B2B, which stands for business-to-business, where transactions are done between businesses, usually suppliers and distributors. B2C e-commerce solutions are computer software or applications that are specifically developed, designed and sold to help businesses carryout operations to directly transact with consumers.

To better understand the concept, look at the usual and standard operations of most manufacturers and businesses, Manufacturers or producers of goods make the products. To reach the market, such goods are coursed first to marketers or distributors, who are responsible for selling the products to consumers. In other words, distributors are serving as intermediaries. Logically, distributors collect commissions or impose added costs to the products" tag prices.

**Pros:** The first advantage of B2C e-commerce solutions is that systems for businesses to transact directly to consumers are established. In turn, consumers would get fairer and more affordable prices for the goods. Because distributors are eliminated, added costs to the tag prices are also eliminated. B2C e-commerce solutions are facilitating establishment of online tools. Thus, consumers can look at and buy the products and services online.

As mentioned, online, direct transactions help lower the overall prices tag of products or commodities. Other than that, added costs could be prevented as both businesses and consumers are avoiding intermediaries. Shopping for products or goods is facilitated faster and is significantly made more convenient. Adjustments to prices tag can be made easier, faster and more instantaneously, to the direct advantage of the business.

If your business would decide to invest in B2C e-commerce solutions, you would be delighted that part of the package is integration and design of call centers, which would help the business boost up. Call centers or customer support services are necessary add on and facilities have help boost sales. Most B2C e-commerce solutions are integrated with such call center services facilities.

**The Advent of Broadband:** While in the past, the speed of Internet connection has always been an issue, technology these days have managed to introduce new solutions to accelerate transactions online, Broadband Internet is now a sought-after technology. And it has effectively made Internet connections and information transfer faster.

With the rise and popularity of broadband, B2C e-commerce solutions are now more useful and helpful. If you aim to boost productivity and sales of your business, invest n B2C e-commerce solutions and see why most businesses are satisfied with such applications.

## 9.3 Web and B2C Ecommerce

The permeation of the Internet and information technologies have rendered online presence imperative for a business to be a success and made ecommerce development one of the key areas of web application development services. The most ubiquitous models that software development companies adopt for ecommerce projects are business-to-consumer

**B2C (business-to-consumer)** is an ecommerce practice aimed at delivering company's services and products directly to an end-user via B2C web application designed specifically for this purpose. Consumers now have a chance to explore the company's services and products, choose commodities or make transactions via a user-friendly B2C app interface. Popular B2C web solutions include online store apps, online banking solutions, online booking systems and online auctions.

### 9.3.1 Pitfall

One of the biggest pitfalls business-to-consumer (B2C) websites fall into is the lack of a primary goal,.

Too many companies have too many goals for their website and have tried to act on them simultaneously. This ultimately confuses the organisation in terms of overall direction and investment, and even confuses the consumer, who cannot understand the value proposition for visiting the site.

Some companies have focused on the wrong goal. For example, some retailers have set up their websites to act solely as an online seller, when an influencer type website driving more traffic to the physical store would be more appropriate for their customers' buying process.

A difficult economy is expected in 2009, which will have an effect on overall retail sales, but the web has already become mainstream for businesses and consumers as part of the buying process.

Gartner says B2C websites already influence over 40% of offline transactions and we will continue to see straight-line growth for e-commerce as a percentage of total retail sales for the next five years.

Although many B2C websites are improving and gravitating towards a primary goal, even more organisations are not. To assist companies that continue to plan and develop their B2C website business model, Gartner has identified four major types of focus for B2C websites: the informer, the influencer, the facilitator and the seller.

**The Informer:** The informer seeks to be the focal point or source of information. Its main goal is to provide information that drives traffic and derives revenue from advertising, membership or both. The informer also offers community functionality, such as the ability for users of a website to interact with other members about products, news events, companies and other areas of interest.

Consumers can post comments, respond to questions and express ideas and this environment for chatting is a powerful "pull" model to keep visitors engaged with activity on the site.

Another characteristic of the informer is explicit personalisation that enables the visitor or member to configure information according to what interests them. For the informer, web content management, social applications and web analytics are important technologies to gather and disperse information. Informer website examples include The New York Times, gartner.com and Engaget.com.

**The Influencer:** The main goal of the influencer is to drive sales, but the final transaction does not necessarily end with an online sale. Promotions, test marketing, product information and tools such as loan calculators and quoting engines, are all part of the influencer's activities.

The influencer also seeks to raise consumer awareness of the company or product. However, the end transaction is not necessarily on the web, nor does it have to be with the company. Consumer goods companies, for example, have sites that influence consumers to go to a reseller to pick up their products, avoiding channel conflicts, and pharmaceutical companies have marketing material online to coax consumers into asking their doctors for the product.

For the influencer, online campaign management, e-mail marketing, brand management, product marketing collateral and lead management are most important for influencing and increasing awareness to ultimately drive a sale. Influencer website examples include Toyota, P&G and Maytag.com.

**The Facilitator:** The main goal of the facilitator is to extend the relationship online, creating a multichannel environment. The facilitator might allow consumers to transact online, but that is only one tool in its arsenal for extending the relationship.

The facilitator seeks to understand where the web fits best in the overall relationship or buying process, and to optimise online functionality, ensuring compatibility and integration with the applications that are used in other channels. For example, an airline company uses a multi-channel relationship in which the web facilitates the booking of flights, displaying frequent-flier mileage and publishing web flight updates while its call centre assists cancellations, seating arrangements and so on, and the airplane delivers the product, the actual flight. For the facilitator, customer analytics, online dialogue and multichannel integration are the most important technologies. Facilitator website examples include Bank of America, American Airlines and Fidelity.com.

**The Seller:** The seller creates an environment for transactions, driving business online. Unlike the facilitator, the seller doesn't mind what you buy, as long as you buy it from the seller, and preferably online.

This type of website is transaction-oriented, and usually includes high-volume products and multibrands. Like the influencer, it uses marketing to drive a sale, often relying on push marketing and promotions to get customers to buy online.

E-commerce includes order management, catalogues, interactive selling tools, web analytics, e-mail marketing/ e-mail response management, and customer self-service, which are all important technologies in the seller's environment. Seller website examples include Amazon, Overstock and Newegg.com.

**Steps to Clear Direction:** First, companies should determine which type of website they should be gravitating towards and whether it matches the company's overall value proposition.

Second, they should identify which type of website they already have, and reconcile this with the type of website they want for future development.

Finally, they need to audit current and future website technologies against the type of website and goal they're gravitating towards. This will immensely help B2C companies with defining and selecting the technology and the business processes used to support it.

Ultimately, companies with a clear direction and understanding of what they provide online will, in turn, be best positioned to demonstrate the value to their online customers.

### 9.3.2 Strategy

Web specialists have at their disposal a wide variety of cutting edge web development technologies and tools that ensure the development of B2C web applications with the following vital features

- **Intuitive User-Friendly Interface** is a must-have feature of B2C/B2B apps as users value simplicity and are not ready to waste their time in order to find their ways in a sophisticated maze. Web professionals leverage Flash, HTML5, JavaScript and other technologies for the development of presentation layer ideas and compelling user experience for B2B/B2C solutions.
- **Security Through Robust Authorization** is imperative when online payments take place and web developers have to make use of their tech savvy to safeguard B2C/B2B users from online fraud.
- **Easy-to-use Web Content Management System** plays a key role for web site administrators since ecommerce app content is subject to frequent changes and B2C/B2B app administrators should be able to update the range of products and services, their descriptions, new pricing schemes and special offers as well as other business information. Software development companies harness popular web CMSs such as WordPress, Joomla, Drupal to accomplish B2C/B2B development tasks.
- **Efficient Search Modules** are another must-have functionality connected with usability and user experience. Customers and business associates should be able to look for necessary information according to their search criteria, browse classified catalogs of B2C/B2B apps smoothly and get relevant results, while software engineers are to make sure that business logic processes the queries and ensures relevancy without latency. For this purpose web programmers take advantage of ASP.NET, JSP, Perl, PHP and other server-side programming technologies.
- **High Capacity Storage Containers and Database Management Systems** are a backbone of B2C and B2B web solutions as B2C/B2C data layer allows companies to keep shopping cart information, special offers and discounts, product information. To implement powerful database components, programmers leverage upscale DBMSs such as MySQL, Oracle, PostgreSQL etc.

  Today there are other elements in business-to-(B2-) schemes, embracing employee and government components and addressing their needs, still B2C models remain the most popular ecommerce solutions in web development.

- **Access Control In B2c Model:** One of the most important requirements for business processes and their management in B2C model is concerned to security features that control Web site access for customers, e-partners, operators and administrators. A successful Web site should not only deliver users the data, which they require, but it should also be secure and restricted to business partners.

  All participants in B2C e-commerce model could be divided into several groups according to their participation in business processes. The first level (the lower one) is occupied by common users – CONSUMERS. They can require and obtain information, products and services from Web sites by using electronic catalogs, electronic documents and electronic payment systems. These processes are managed and performed by the Inside management system. Thus, the second level is occupied by the mangers of consumers' part in B2C model. They use a database (DB) which is structured in order to store the information for all users, registered in the system. As soon as the consumers from the first level have no any rights except using different Web sites, the level MANAGERS is responsible for tracing the consumers' operations. All data are stored in DB and are used for reports and graphics concerned to Web site utilization.

Improvements that Web merchants could make to encourage more browsers to become buyers are:

- Target the goal-oriented, intentional shoppers with communications directed at them.
- Design Web sites to provide easy-to-access and simple-to-use product information.
- Make it easier to comparison shop.
- Make it easier to return merchandise.
- Create policies for better credit card and personal information security.
- Make it easier to locate items on the Web site.
- Create customer service facilities where users can get the answers to their questions and product advice.
- Increase delivery speeds.
- Present products more clearly.
- Create loyalty reward programs.
- Make the buying process quicker to complete.

Some Web site design features that impact online purchasing are:

Commerce or that are perceived as "fun" to use, are more successful in attracting and retaining visitors.

- **Short Download Times:** Sites that take too long to download will experience higher abandonment rates, although this can be diminished somewhat by providing online amusement to distract the consumer.

- **Simplicity of Design:** The most important aspects of site design for generating sales are product list navigation and choice features that save consumers time.

- **Interactive Consumer Decision Aids:** Recommendation agents (programs) that are used to recommend a product based on the consumer completing a survey, a review of the consumer's profile, or based on the purchases of other consumers who have bought the same product can also drive sales.

- **Responsiveness to Consumer Inquiries:** Prompt and complete responses through automated customer response systems or online customer service centers can also positively affect return visits and purchases.

### 1.3.3 Recommender System

*Recommender systems* are being used by an ever-increasing number of E-commerce sites to help consumers find products to purchase.Recommender systems are used by E-commerce sites to suggest products to their customers and to provide consumers with information to help them decide which products to purchase. The products can be recommended based on the top overall sellers on a site, on the demographics of the consumer, or on an analysis of the past buying behavior of the consumer as a prediction for future

Recommender systems enhance sales in three ways:

**Converting Browsers into Buyers:** Visitors to a Web site often look over the site without purchasing anything. Recommender systems can help consumers find products they wish to purchase.

**Increasing Cross-sell**: Recommender systems improve cross-sell by suggesting additional products for the customer to purchase. If the recommendations are good, the average order size should increase. For instance, a site might recommend additional products in

the checkout process, based on those products already in the shopping cart.

**Building Loyalty**: In a world where a site's competitors are only a click or two away, gaining consumer loyalty is an essential business strategy (Reichheld and Sesser, 1990; Reichheld, 1993). Recommender systems improve loyalty by creating a value-added

relationship between the site and the customer. Sites invest in learning about their customers, use recommender systems to operationalize that learning, and present custom interfaces that match consumer needs. Consumers repay these sites by returning to the ones that best match their needs. The more a customer uses the recommendation system – teaching it what he wants – the more loyal he is to the site. "Even if a competitor were to build the exact same capabilities, a customer … would have to spend an inordinate amount of time and energy teaching the competitor what the company already knows" (Pine, et al., 1995). Creating

relationships between consumers can also increase loyalty, for consumers will return to the site that recommends people with whom they will like to interact.

### 1.3.4 Technology

**Push-Pull Technology:** Currently, one of the most fashionable technologies within the Internet is "Push" technology. Contrary to the 'Pull' world of web pages where users request data from another program or computer, via a web browser, "Push" enables services to be targeted at the user, without them having to initiate the information collection activity. Instead, information finds the user. In other words, an automated retrieval of data from the Internet, corporate data sources and e-commerce web sites, is delivered directly to specific user populations in a personalised manner. "Push" Technology allows you to become an integral part of your customers daily lives by enforcing your brands and services directly to them every day. Key messages and personalised information that they have requested, and critical information can be delivered to their desktop, screen saver, any wireless device, mail account and more. "Push" amplifies and extends your current Web presence while providing new and valuable services. Your customer is directed back to your Web site for more in-depth information. This technology eliminates the need to wait for customers to visit your site, instead, allowing an organisation to take their business to their customer base.

In order for companies to be able to use this technology, they require their customers to download and install a piece of client software onto their computers. The software interacts with the Web, and provides the interface through which context sensitive content is delivered.

Infogate, a Web based company, claim to have over 10 years experience delivering critical content on behalf of partners to their customers and end-users, and also claim to increase customer retention, and thus increase revenue.

**- www.infogate.com** : Another good example of "push" technology is the PointCast news system that broadcasts the news, sports and weather, covering topics selected through the desktop client. In the case of PointCast, they are then displayed as an attractive screensaver saver application.

**- www.pointcast.com:** Perhaps, an unusual point about "push" broadcasters is that they still use the HTTP protocol, and though they are called "push", it is the client that starts the session with the server using HTTP commands.

BackWeb is another Web based company also offering "push" technology. However, BackWeb do not use HTTP protocols, but has its own set of propriety protocols that allow a non-HTTP session to be established between the client and the server, again, client software is required, and has to be downloaded from their site.

**- www.backweb.com** : Another method of creating a "push" server, is to program exactly the type of broadcast station you want. A good software development system for such, is Marimba's Castanet software that is designed to push Java applets and Shockwave animation, entertainment and interactive multimedia content to specific users.

Marimba's Server Management also includes integration with Microsoft Internet Information Server (IIS). This functionality allows Marimba's Server Management product family to package and distribute commonly used server applications that are based on Microsoft IIS, such as Microsoft Commerce Server 2000 and Allaire's ColdFusion.

Marimba's solutions can be priced by following the "About Us" link on their Web site, were contact information is available. Also, the Marimba site offers Flash demos, white papers, datasheets and Web seminars for download by following their "Product" link.

Information coming via push technology will be personalized whereas spam is designed as generic information to be pushed to the masses.

Pull technology or client pull is a style of network communication where the initial request for data originates from the client, and then is responded to by the server. The pull technology is effective and economical when advertising to open, unidentified potential customers world wide. It is more effective for the customer when he searches for a specific item. Most web feeds, such as Really Simple Syndication (RSS) are technically pulled by the client. SMS banking services are operated using both push and pull messages. Typically push messages could be either mobile marketing messages or messages alerting an event which happens in the customer's bank account, such as a large withdrawal of funds from the ATM or a large payment using the customer's credit card.

**A. Push Technology:** Push, or server push, describes a style of Internet-based communication where the request for a given transaction is initiated by the publisher or central server. It is contrasted with pull, where the request for the transmission of information is initiated by the receiver or client. Push services are often based on information preferences expressed in advance. This is called a publish/subscribe model. A client might "subscribe" to various information "channels". Whenever new content is available on one of those channels, the server would push that information out to the user.

Synchronous conferencing and instant messaging are typical examples of push services. Chat messages and sometimes files are pushed to the user as soon as they are received by the messaging service. Both decentralised peer-to-peer programs (such as WASTE) and centralised programs (such as IRC or XMPP) allow pushing files, which means the sender initiates the data transfer rather than the recipient.

Email may also be a push system: the SMTP protocol is a push protocol (see Push e-mail). However, the last step —from mail server to desktop computer— typically uses a pull protocol like POP3 or IMAP. Modern e-mail clients make this step seem instantaneous by repeatedly polling the mail server, frequently checking it for new mail. The IMAP protocol includes the IDLE command, which allows the server to tell the client when new messages arrive. The original Blackberry was the first popular example of push code for email in a wireless context.

Another popular type of Internet push code was PointCast Network, which gained popularity in the 1990s. It delivered news and stock market data. Both Netscape and Microsoft integrated it into their software at the height of the browser wars, but it later faded away and was replaced in the 2000s with RSS (a pull code).

Other uses are push enabled web applications including market data distribution (stock tickers), online chat/messaging systems (web chat), auctions, online betting and gaming, sport results, monitoring consoles and sensor network monitoring.

The concept of information "push" technology originated as a way to automate the searching and retrieval of information from the Internet, such as stock market news and weather forecasts.

Based on user-defined criteria, a push application automatically searches a database for specific information and delivers it straight to the end-user's desktop.

It is a convenient way to receive information the user may not otherwise know exists, and eliminates the need to go and find it.

However, the concept (and the technology) struggled to take off in its original medium and even today I wonder how many companies - particularly in manufacturing - recognise that this little-known business tool can generate benefits via improvements in workflow, communications and activity response times.

**B. Pull Technology:** Pull coding or client pull is a style of network communication where the initial request for data originates from the client, and then is responded to by the server. The reverse is known as push technology, where the server *pushes* data to clients.. Usually, customers will look for a site and visit only if it provides helpful and attractive contents and display. The pull code is effective and economical when advertising to open, unidentified potential customers world wide. It is more effective for the customer when he searches for a specific item.

Pull requests form the foundation of network computing, where many clients request data from centralised servers. Pull is used extensively on the Internet for HTTP page requests from websites.

A *push* can also be simulated using multiple *pulls* within a short amount of time. For example, when pulling POP3 email messages from a server, a client can make regular pull requests every few minutes. To the user, the email then appears to be pushed, as emails appear to arrive close to real-time. The tradeoff is this places a heavier load on both the server and network in order to function correctly.

Most web feeds, such as RSS are technically pulled by the client. With RSS, the user's RSS reader polls the server periodically for new content; the server does not send information to the client unrequested. This continual polling is inefficient and has contributed to the shutdown or reduction of several popular

RSS feeds that could not handle the bandwidth. For solving this problem, the PubSub Hubbub protocol as another example of a push code was devised.

**C. Impact:** Pull technology or client pull is a style of network communication where the initial request for data originates from the client, and then is responded to by the server. The pull technology is effective and economical when advertising to open, unidentified potential customers world wide. It is more effective for the customer when he searches for a specific item. Most web feeds, such as Really Simple Syndication (RSS) are technically pulled by the client. SMS banking services are operated using both push and pull messages. Typically push messages could be either mobile marketing messages or messages alerting an event which happens in the customer's bank account, such as a large withdrawal of funds from the ATM or a large payment using the customer's credit card.

## 9.4 Summary

B2C e-commerce solutions is that systems for businesses to transact directly to consumers are established. Face of B2C is website. Every transaction or success of b2c depend on how website looks, promises, appeals to customers. Web site play a vital role in B2C's success. It's Contents, presentation, security, feel of products are some of the key issues that B2C website must address. It is the website that makes impression about company or product. Image or brand building is governed by web site. It is right to conclude that b2c business based/ survive on web site. We have talked about strategy, policies and various issues related to it. Another thing is recommender system is again a key method on web site to improve sale.Pull, push technologies and their impact on B2C is described. Push, or server push, describes a style of Internet-based communication where the request for a given transaction is initiated by the publisher or central server. Pull coding or client pull is a style of network communication where the initial request for data originates from the client, and then is responded to by the server. The pull technology is effective and economical when advertising to open, unidentified potential customers world wide. It is more effective for the customer when he searches for a specific item.

## 9.5 Self Assessment Questions

1. How B2c reaches to customers effectively?
2. Why Website paly a key role in B2C's success?
3. Explain some Key points to Web design for B2C.
4. What advantage recommender system provides to B2C ?
5. Give Impact of push technique in B2C.
6. Compare push & pull technology.

## 9.6 Reference Books


- E-Commerce by Ravi Chandren
- Bhattacherjee, A (2001). "An Empirical Analysis of the Antecedents of Electronic Commerce Service Continuance", *Decisions Support Systems*, Vol. 32, Iss. 2, pp 201–214.
- Brown, I and Buys, M (2005). "Customer Satisfaction with Internet Banking Web Sites:
- An Empirical Test and Validation of a Measuring Instrument", *South African Computer Journal*, Vol. 39, pp 29 – 37.

# Unit - 10 : Electronic Payment System

**Structure of Unit:**



## 10.0 Objectives

After completing this unit, you would be able to:

- Understand Electronic payment system
- Components of e-payments
- Point out the difference between traditional payment system and e payments
- Know about the need of e security
- To learn how to prevent frauds
- Understand the risk associated with e-payments.

## 10.1 Introduction

E payment is a subset of an e-commerce transaction to include electronic payment for buying and selling goods or services offered through the Internet. Generally we think of electronic payments as referring to online transactions on the internet, there are actually many forms of electronic payments. As technology developing, the range of devices and processes to transact electronically continues to increase while the percentage of cash and check transactions continues to decrease. In the US, for example, checks have declined from 85% of non-cash payments in 1979 to 59% in 2002, and electronic payments have grown to 41%.

The Internet has the potential to become the most active trade intermediary within a decade. Also, Internet shopping may revolutionize retailing by allowing consumers to sit in their homes and buy an enormous variety of products and services from all over the worlds. Many businesses and consumers are still wary of conducting extensive business electronically. However, almost everyone will use the form of E Commerce in near future.

This site will discuss the e commerce developing procedure in national level especially on e payment system. Also strategy for fostering increased business and consumer confidence in the use of electronic networks for commerce and payment system.

## 10.2 What is Electronic Payment System?

### 1.2.1 Meaning of Electronic Payment System

The term '**electronic payment**' is a collective phrase for the many different kinds of electronic payment methods available (also meaning online payment), and the processing of transactions and their application within online merchants and ecommerce websites.

It is essential for all online businesses to be able to accept and process electronic payments in a fast and secure way. Businesses can gain a significant advantage over their competitors by providing an instant electronic payment service as it lets customers pay by their preferred way of credit or debit card.

Electronic payments systems can also increase your cash flow, reduce administrative costs and labour and provide yet another way for your customers to pay. Care must be taken when choosing an electronic payment solution as it will need to fit within the constraints of your particular online business and integrate seamlessly within your website. It can be depicted as under:-

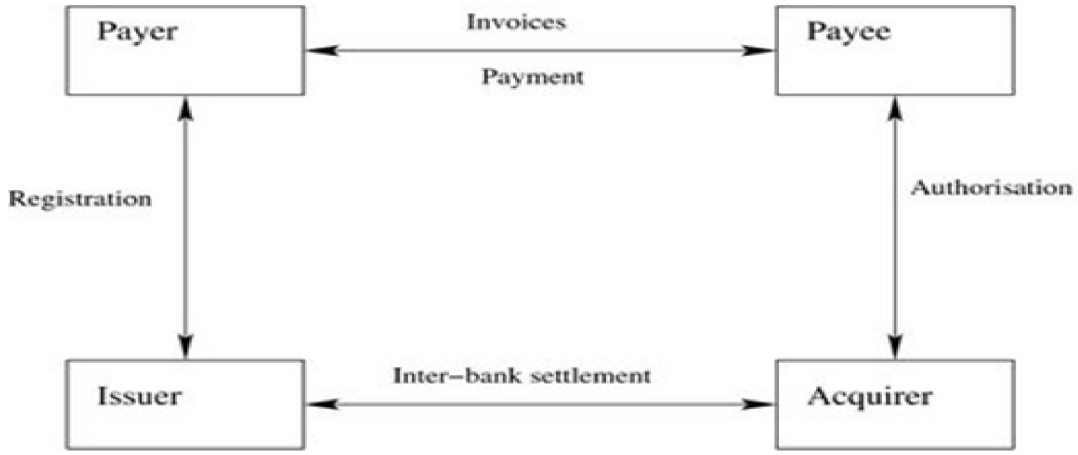


**Figure – 10.1**

**Definitions**

**(1) According to Mc Davis:** "Electronic Payment 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."

**(2) According to Kritner:** "Electronic Payment is a means of making payments over an electronic network such as the Internet".

**(3) According to M.Lillen:** "Electronic Payment some time called as e- payment is a digital payment for a transaction made on the Internet".

### 10.2.2 Methods and Types of Electronic Payment

An electronic payment is any kind of non-cash payment that doesn't involve a paper check. Methods of electronic payments include credit cards, debit cards and the **ACH** (Automated Clearing House) network. The ACH system comprises direct deposit, direct debit and electronic checks (e-checks).

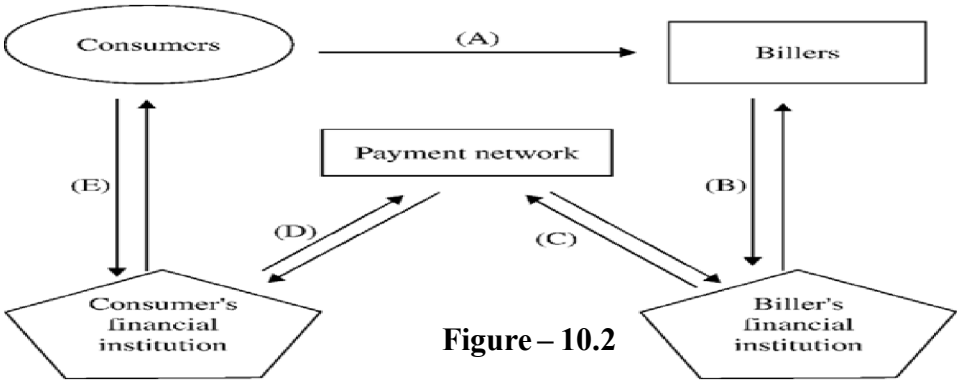


**Figure – 10.2**

For all these methods of electronic payment, there are three main types of transactions:

1. A **One-time Customer-to-vendor Payment** is commonly used when you shop online at an e-commmerce site, such as Amazon. You click on the shopping cart icon, type in your credit card information and click on the checkout button. The site processes your credit card information and sends you an e-mail notifiying you that your payment was received. On some Web sites, you can use an e-check instead of a credit card. To pay by e-check, you type in your account number and your bank's routing number. The vendor authorizes payment through the customer's bank, which then either initiates an **electronic funds transfer** (EFT) or prints a check and mails it to the vendor.
2. You make a **recurring customer-to-vendor payment** when you pay a bill through a regularly scheduled direct debit from your checking account or an automatic charge to your credit card. This type of payment plan is commonly offered by car insurance companies, phone companies and loan management companies. Some long-term contracts (like those at gyms or fitness centers) require this type of automated payment schedule.
3. To use **automatic bank-to-vendor payment**, your bank must offer a service called **online bill pay**. You log on to your bank's Web site, enter the vendor's information and authorize your bank to electronically transfer money from your account to pay your bill. In most cases, you can choose whether to do this manually for each billing cycle or have your bills automatically paid on the same day each month.

### 1.2.3 Advantages of Electronic Payment System

1. Electronic payment is very convenient for the consumer.
2. In most cases, you on y need to enter your account information such as your credit card the page released on the use of Web server.
3. When you come back to the your username and password. Completing a transaction is as simple as clicking your mouse: All you have to do is confirm your purchase and you're done.
4. Electronic payment lowers costs for businesses.
5. The more payments they can process electronically, the less patent can also help business one customer retention customer is more
6. Likely to run to the same e-commerce is e where his or her information has already
7. Written and stored. With all the benefits of electronic payment, it's no wonder of use is on the rise.
8. In order to better serve their customers, banks are swiftly moving to offer online bill pay services. Grant Thornton's 2005 survey of bank executives found that 65 percent of community banks and 94 percent of large banks offer 24/7 online bill payment. Most of these services are free to members and coordinate easily with personal software programs such as Quicken or MS Money.
9. Alternatively, consumers can subscribe to online bill pay services such as Pay trust or Yahoo Bill Pay.
10. These services charge a monthly fee in exchange for the convenience of paperless bill paying.
11. Capacity! Throughput - A study of ETC on the Tappan Zee Bridge in New York City it could process 1,000 vehicles/hour (vph), while a manual lane could handle only 400—450 pHs.

12. Customer Satisfaction - Twenty percent of travellers on two bridges in Lee County, used their departure times as a result of value pricing and electronic toys.
13. Productivity- Based on changes in traffic conditions after deployment of E-Z Pass, passenger cars on the New Jersey turnpike saved an estimated $19 million in delay costs and $1.5 million in fuel costs each year.
14. Energy Environment - Model calculations of emissions using the EPA Mobile File of a model and traffic field data indicated ETC decreased CO by 7.3%, decreased hydrocarbons by 7.2%, and increased NOT by 33.8% at the Holland East Toll Plaza in Florida. NOT increased as a result of higher engine speeds.

**Disadvantages**

1. The main drawbacks to electronic payments are concerns over privacy and the possibility of identity theft.
2. Fortunately, there are many safeguards available to protect your sensitive personal information from falling into the wrong hands.
3. You can defend yourself against identity theft by using virus protection software and a firewall on your computer.
4. You should also make sure that you send your credit card information over a secure server.
5. Your Internet browser will notify you when a server is secure by showing a lock or key icon.
6. In addition, the URL on a secure site is usually designated by the prefix "https" instead of "http." Retailers do their part by using data encryption, which codes your information in such a way that only the key holder can decode it.
7. Lack of applicability
8. Not all the web sites support a particular payment method, thus limiting customers ability to pay.
9. Credit cards work only with merchants who have signed-up to the services of corresponding credit card Company, and do not supports direct B2B to interpersonal payments.
10. Lack of eligibility
11. Not every potential customer with money and intention to pay can make use of certain payment methods.
12. Not all potential buyers can obtain credit cards due to credit history limitations, low income or other reasons.
13. High usage costs for customers and merchants
14. existing payment systems use rather expensive infrastructure to facilitate the payment process.
15. Credit cards are expensive for end users, not in the least because of the enormous and growing size of fraud which amounts to billion dollars pr 'rear this loss is invisibly re financed by users by the higher costs of credit card services.
16. In addition, credit card payments are still heavily paper dependent. Most credit card bills are sent in a paper form to customers by post, and the bills are mostly settled by posting paper documents.

17. lack of efficiency
18. Some payments over the internet can be too small to be handled by existing payment systems, because of overheads included in the processing of payments and transaction.
19. Credit cards are too expensive for effecting small payments and are unsuited for small transactions.
20. The minimum fixed fee charged to the retailer for processing a transaction could even surpass the value of the goods sold.
21. Privacy concerns aside, some people simply dislike making electronic payments. They find the setup too time-consuming and don't want more logons and passwords to remember
22. Others simply prefer the familiarity of writing checks and dropping envelopes in the mail.
23. Regardless of these concerns, electronic payment will likely continue to rise in popularity.

## 10.3 Operational, Credit and legal Risks of Electronic Payment System

There are three types of risk in electronic payment system

1. Operational
2. Credit and
3. legal risk

Over the past decade, the Internet has evolved from a specific resource for IT pros and computer geeks to a daily destination for people all over the world. Technology has inarguably made our lives easier. Recent years have seen an explosive growth in the online retail arena. Many people are just as willing to order a movie from Netflix as they are to stop by their local Blockbuster or Hollywood Video. One of the biggest technological innovations is in the area of banking, finance and commerce – the Electronic Payments. Electronic Payments or e-payments refer to the technological breakthrough that enables us to perform financial transactions electronically.

E-payments have several advantages, which were never available through the traditional modes of payment. Some of the most important are:

- Privacy
- Integrity
- Compatibility
- Good transaction efficiency
- Acceptability
- Convenience
- Mobility
- Low financial risk
- Anonymity

Perhaps the greatest advantage of e-payments is the convenience. Individuals can pay their bills and make purchases at unconventional locations 24 hours a day, 7 days a week, 365 days a year. There is no waiting for a merchant or business to open. Vacationers and others away from home need not worry that they forgot to drop off the payment for the utilities or mail the check for their credit card bill. Theycan simply pull up their account online and pay their bills on the road.

This leads to the second best benefit of e-payments- they save time. Once the initial set-up of the payment system for each account is completed, an individual can pay his bills in a flash. In a research study Marketwatch.com found that the average American, who writes checks and mails them for payment, spends over 24 hours during the course of a year paying bills. E-payments have reduced the amount of time spent on bill management or payment by about 60%. This has given busy individuals more time to spend doing those things they enjoy.

The cost of e-payments is yet another benefit. For the majority of merchants, vendors, and businesses, there is no fee or charge to pay online. For others, the fee is nominal. Compared to the cost of postage, check writing fees and trips to the post office, individuals paying their bills online can save hundreds of dollars per year. In this day and age, reducing expenses is quite important for many individuals.

Finally, despite the belief of many to the contrary, e-payments are secure. They may even be more secure than the old fashion way of mailing in a check. According to most sources, most instances of identity theft occur by stealing mail out of a person's mailbox or from discarded trash, not over the Internet. Encryption technology allows an individual's personal financial data to be scrambled before it is sent electronically. It also lowers the risk of human error by reducing the number of people touching the payment once it leaves the payer.

On the flip side, with so many benefits to using e-payments, it's important to remember that there are negative aspects too. Some of the biggest downsides of e-payments are the lack of authentication, repudiation of charges and credit card fraud. There is no way to authenticate or verify that the individual entering the information online is who they say they are. There is no request for picture identification or even a signature. Therefore, an unauthorized user may carry out transactions in your name before you have time to alert authorities the information has been taken. Because no identifying information is provided at the time of the online payment, an individual may have an extremely hard time disputing a charge later. Further, given the benefits of convenience and speed that come along with e-payments, this creates the perfect opportunity for fraudulent credit card transactions.

One of the other disadvantages of e-payments is that most sites require you to open an online account with them. You need to register with the institution in order to be authorized to perform money transactions with them. While the overall payment process is efficient, the initial registration to a given site can be time-consuming. It also involves a username and a password, which implies the need of password protection, to maintain an e-payment account at each organization. If a person has more than one or two accounts, e-payments can become extremely cumbersome.

### 10.3.1 Problems With The Traditional Payment Systems

**Lack of Convenience:** Traditional payment systems require the consumer to either send paper cheques by snail-mail or require him/her to physically come over and sign papers before performing a transaction. This may lead to annoying circumstances sometimes.

**Lack of Security:** This is because the consumer has to send all confidential data on a paper, which is not encrypted, that too by post where it may be read by anyone.

**Lack of Coverage:** When we talk in terms of current businesses, they span many countries or states. These business houses need faster transactions everywhere. This is not possible without the bank having branch near all of the companies offices. This statement is self-explanatory.

**Lack of Eligibility:** Not all potential buyers may have a bank account.

**Lack of Support for Micro-transactions:** Many transactions done on the Internet are of very low cost though they involve data flow between two entities in two countries.

### 1.3.2 How to Prevent Electronic-Payment Fraud

As it relates to electronic payments, fraud occurs in three main forms: "friendly," internal and external. Friendly fraud refers to when an individual purchases goods or services with the intention of using consumer-friendly rules to get out of paying for them. External fraud occurs when a customer provides a merchant with false information, e.g., a fraudulent credit-card number. Internal fraud is when a trusted employee steals from the merchant through various techniques.

In a self-storage environment, friendly fraud is not likely. Your greatest defense is you have the ultimate control to access a customer's unit if payment is not valid. Your biggest risk is at the end of the lease when you relinquish a tenant's goods.

At this point, the customer can file a chargeback claim, and you must be prepared to respond to an inquiry or chargeback issuance from the payment processor. If possible, get an electronic swipe of the card if it's a credit card or ask for a debit card instead. When a credit card is keyed in rather than swiped on a terminal, never assume the charge will survive a chargeback—it won't.

External fraud will also have minimal impact on a storage operator. The presentation of a stolen card for a recurring charge like rent is rare. This is because, on average, the rightful cardholder will be aware of any unauthorized activity within 45 days and cancel the card. In most cases, this occurs within days of it being stolen or lost. Your greatest area of concern is internal fraud, which happens when an employee with access to the payment system abuses the privilege to steal money. Internal fraud can go on for years before it is discovered. Many experts in the payment industry believe the majority of these cases are never exposed.

The most common form of internal fraud is the issuing of inappropriate credits. For example, an employee might issue a credit to a friend's credit card against a merchant charge that never occurred or issue a credit in excess of the original charge amount. He might also issue a partial or complete credit to a customer with the intention of charging less for rent or retail product than he should.

#### Audit Procedures

With these tactics in mind, it's imperative that you have a specific set of audit procedures to monitor payment activities. Following is a recommended six-step protocol to reduce merchant-service fraud. When possible, separate and rotate these activities, and conduct audits on a random but frequent basis:

1. Understand the merchant-service statement.
2. Control all voids.
3. Investigate all charge-backs.
4. Monitor all credits.
5. Look for patterns.

**Understand the Merchant-service Statement:** You should have a solid understanding of the basic elements of your merchant-service statement. These include the statement cycle, format, location of specific information and terminology. The statement should never be mailed to the facility office but to an off-site location where independent monitoring can occur. If you aren't comfortable monitoring your own statement, hire a payment professional to assist.

**Control All Voids:** When possible, require a manager to authorize and verify every void before issuance, and independently monitor the components of each. The following information should be recorded: the

reason for the void, the employee who issued it, the date and time of the void, all the associated receipts, and the signature of the customer to whom the void was issued.

**Investigate All Charge-backs:** Handle charge-backs similarly to voids. For each, log the reason it occurred, the employee who initiated the sale, the date and time of sale, and the credit-card number from which the chargeback derived. You should develop a detailed information trail on all chargeback activity, auditing each one not only from the perspective of the particular event, but looking to see if a larger system or organizational issue needs to be addressed.

**Monitor All Credits:** The same type of log is necessary for all credits. Make note of the reason for the credit, the employee who issued it, the employee who made the sale, the date and time of the sale and credit, and the account number used for the initial payment. This information must match the account for which the credit is issued. You'll also need the signature and phone number of the customer for auditing purposes.

**Look for Patterns:** This is singularly important. Often a pattern emerges in void, chargeback and credit activity, and this should prompt a detailed evaluation. To establish a base pattern for the business, review the last six months of merchant-service statements, tabulating norms. Make careful note of the following:

- Percentage of downgrades
- Types of downgrades
- Percentage of each downgrade type
- Percentage of charge-backs
- Percentage of voids
- Percentage of credits
- Percentage of transactions by card type

## 10.4 Components of Effective Electronic Payment system

The components of Electronic Payment system are described as below in details:

**(1). Computer Network:**

- A computer network is a group of interconnected computers. Network s may be classified according to a wide variety of characteristics.
- Based on their scale, networks can be classified as Local Area Network (LAN), Wide Area Network (WAN), Metropolitan Area Network (MAN), Personal Area Network (PAN), etc.
- Computer networks can also be classified according to the hardware and software technology that is used to interconnect the individual devices in the network, such as Optical fibre, Ethernet, Wireless LAN, Home PNA, or Power line communication. Ethernet uses physical wiring to connect devices. Frequently deployed devices include hubs, switches, bridges and/or routers.
- Wireless LAN technology is designed to connect devices without wiring. These devices use radio waves or infrared signals as a transmission medium. Computer networks may be classified according to the functional relationships which exist among the elements of the network, e.g., Active Networking, Client-server and Peer-to-peer (workgroup) architecture.
- Computer networks may be classified according to the network topology upon which the network is based, such as Bus network, Star network, Ring network, Mesh network, Star-bus network.

- Tree or Hierarchical topology network, Network Topology signifies the way n which devices in the network see their logical relations to one another. The use of the term "logical" here is significant.
- That is, network topology is independent of the "physical" layout of the network. Even if networked computers are physically placed in a linear arrangement, if they are connected via a hub, the network has a Star topology, rather than a Bus Topology, in this regard the visual and operational characteristics of a network are distinct; the logical network topology is not necessarily the same as the physical layout.

**(2). Internet:**

- The Internet is a specific internet work. It consists of a worldwide incoming connection of governmental, academic, public, and private networks based upon the networking technologies of the Internet Protocol Suite.
- It is the successor of the Advanced Research Projects Agency Network (ARPANET) developed by DARPA of the U.S. Department of Defense.
- The internet is also the communications backbone underlying the World Wide Web (WWW).
- The 'Internet' is most commonly spelled with a capital 'I' as a proper noun, for historical reasons and to distinguish it from other generic internet works.
- Participants in the Internet use a diverse array of methods of several hundred documented, and often standardized, protocols compatible with the Internet Protocol
- Suite and an addressing system (IP Addresses) administered by the Internet Assigned Numbers Authority and address registries.
- Service providers and large enterprises exchange information about the reach ability of their address spaces through the [Border Gateway Protocol] (BGP), forming a redundant worldwide mesh of transmission paths.

**(3). Basic Hardware Components**:

- All networks are made up of basic hardware bà11ing blocks to interconnect network nodes, such as Network Interface Cards
- (NICs), Bridges, Hubs, Switches, and Routers.
- In addition, some method of connecting these building blocks is required, usually in the form of galvanic cable.
- Less common are microwave links (as in IEEE 802.11) or optical cable ("optical fibre").

**(4). Network Interface Cards**

- A network card, network adapter or NIC (network interface card) is a piece of computer hardware designed to allow computers to communicate over a computer network.
- It provides physical access to a networking medium and often 'provides a low-level addressing system through the use of MAC addresses.
- It allows users to connect to each other either by using cables or wirelessly.

**(5). Repeater**

- Repeater is an electronic device that receives a signal and retransmits it at a higher rate, or to the other side of an obstruction, so that the signal can cover longer distances without degradation.
- In most twisted pair Ethernet configurations, repeaters are required for cable runs longer than 100 meters away from the computer.

**(6). Hubs**

- A Hub contains multiple ports.
- When a packet arrives at one port, it is copied to all the ports of the hub for transmission.
- When the packets are copied, the destination address in the frame does not change to a broadcast address.
- It simply copies the data to all of the Nodes connected to the hub.

**(7). Bridges**

- Network Bridge connects multiple network segments at the data link layer (layer 2) of the OSI model.
- Bridges do not promiscuously copy traffic to all ports, as hubs do, but learn which MAC addresses are reachable through specific ports.
- Once the bridge associates a port and an address, it will send traffic for that address only to that port. Bridges do send broadcasts to all ports except the one on which the broadcast was received.
- Bridges learn the association of ports and addresses by examining the source address of frames that it sees on various ports.
- Once a frame arrives through a port, its source address is stored and the bridge assumes that MAC address is associated with that port.
- The first time that a previously unknown destination address is seen, the bridge will forward the frame to all ports other than the one on which the frame arrived.

Bridges come in three basic types:

**1.** Local bridges: Directly connect local area networks (LANs)

**2.** Remote bridges: Can be used to create a wide area network (WAN) link between

LANs. Remote bridges, where the connecting link is slower than the end networks, largely have been replaced by routers.

**3.**Wireless bridges**:** Can be used to join LANs or connect remote stations to LANs.

**(8). Switches**

- A switch is a device that performs switching. Specifically, it forwards and filters
- OSI layer 2 data grams (chunk of data communication) between ports (connected cables) based on the MAC addresses in the packets.

- This is distinct from a hub in that it only forwards the datagram to the ports involved in the communications rather than all ports connected.
- Strictly speaking, a switch is not capable of routing traffic based on IP address (layer 3) which is necessary for communicating between network segments or within a large or complex LAN.
- Some switches are capable of routing based on IP addresses but are still called switches as a marketing term.
- A switch normally has numerous ports, with the intention being that most or the entire network is connected directly to the switch, or another switch that is in. turn connected to a switch.
- Switch is a marketing term that encompasses routers and bridges, as well as devices that may distribute traffic on load or by application content (e.g., a Web URL identifier).
- Switches may operate at one or more OSI model layers, including physical, data link, network, or transport (i.e., end-to-end).
- A device that operates simultaneously at more than one of these layers is called a multilayer switch.

**(9). Routers**

- Routers are networking devices that forward data packets between networks using headers and forwarding tables to determine the best path to forward the packets.
- Routers work at the network layer of the TCP/IP model or layer 3 of the OSI model.
- Routers also provide interconnectivity between like and unlike media (RFC 1810).
- This is accomplished by examining the Header of a data packet, and making a decision on the next hop to which it should be sent (RFC 1810).
- They use preconfigured static routes, status of their hardware interfaces, and routing protocols to select the best route between any two subnets.
- A router is connected to at least two networks, commonly two LANs or WANs or a LAN and its ISP's network.
- Some DSL and cable modems, for home (and even office) use, have been integrated with routers to allow multiple home/office computers to access the Internet through the same connection.
- Many of these new devices also consist of wireless access points (waps) or wireless routers to allow for IEEE 802.1 lg/b wireless enabled devices to connect to the network' without the need for cabled connections.

### 1.5 E-Security

While there are benefits associated with the widespread popularity of the Internet and ever-increasing growth rate of the computers being connected to it, there is a down side too. The task of protection of the data and information stored in the computers and travelling across the Internet has never been so challenging. Computer and Internet Security, therefore, has become a specialized area in itself. The internet provides great opportunities for business to reach new markets and more customers than ever before, but unfortunately, with those opportunities come some e-security risks. When online, unwanted intruders can:

- Install malicious software such as spyware and viruses, which can steal sensitive business information as well as slow down your computer.

- Intercept financial transactions, steal credit card details and access customer information.
- Steal your download limit without your knowledge and at your cost.
- Take over your website and modify it.
- Steal sensitive business information from your business by using a portable device such as a USB.

E Security Computer and Internet Security Services is a modest effort to provide professional services to the Internet community, especially that of GNSE Group. We offer a broad array of services.

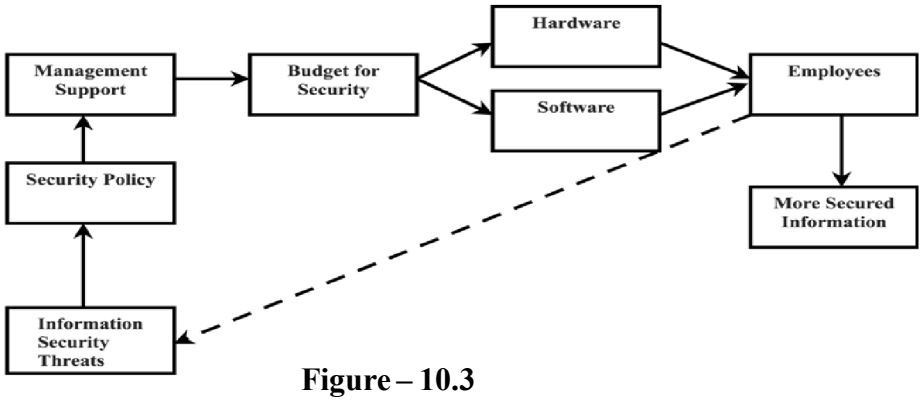


**Figure – 10.3**

**Definition**

**According to G.S.Gill**

"E-security refers to the process of ensuring the confidentiality, integrity, and availability of electronic information and protecting it against malicious attackers who could use or alter the information to disrupt critical national infrastructure and industry."

Security is of prime importance for conducting e-business. It is important to know few measures that organizations can employ to enable secure e-business transactions. Cryptography is one of the measures. It is the art and science of encrypting and decrypting data under secret keys for the purpose of secrecy or authenticity. It facilitates the secure storage and transmission of critical data in an insecure network. PKI also ensures the security of communication and transfer of critical information through the Internet. It involves the use of digital certificates and CA ,digital signatures and secure channels. E-Business can be conducted by the use of two different payment systems, namely, stored account payment system and SAPS. The stored account payment system involves the existing electronic payment system like that of a credit card system or a debit card system. The SAPS replaces cash with e-cash. E-Cash is a way of accepting payment over the Internet in which the currency is converted into its digital equivalent. Finally, the chapter talks about acceptable use policy which is an agreement that covers certain rules and principles that govern the fair use of Internet service. Indian companies mainly use firewalls as a security measure to prevent unwanted traffic from permeating the walls of the network. Two approaches that ensure protection from e-mail related threats are the proxy approach and the appliance approach. In the former approach, e-mail filtering tools acts only as a web content filtering tool blocking the e-mail websites and not the e-mail itself. Appliance approach involves the installation of e-mail filtering tools in line with several e-mail servers.

Both unacceptable e-mails and attachments are blocked in this approach. The assessment of an e-mail filtering solution is done based on its extent of integration, review of its actual working mechanism and reporting features. Web bug is a technology that helps in tracing the path of an e-mail and knowing if the e-mail has been checked and further forwarded or not. Security issues that earlier confronted computer systems are making wireless devices like PDAs, palm tops and cell phones their victims. Phishing and

Pharming are two forms of identity theft. Phishing is a fraudster campaign that makes the recipients of an e-mail disclose sensitive personal information like log-on IDs and account numbers. This kind of attack is activated when users click on a link in the e-mail message. A pharming attack involves redirecting recipients of messages to look alike websites. Layered security approach is one of the most reliable Internet security approaches. It provides protection at five important access levels - the perimeter, the network hub, the host file, the network application, and the stored data. A protection system should comprise three components — IDS/IPS software, VMS and an endpoint compliance policy. Sender ID framework and Domain Keys are two recent developments developed for enhanced security with e-mails.

## 10.5 E- Security

**The Potential of the Internet:** riginally developed as a network for military communication, the Internet now connects millions of computers all over the world, allowing governments, businesses and individuals to exchange a wide variety of information. Email and the World Wide Web are two of the most popular services to make use of the Internet. An estimated 500 million people are now connected to the Internet, and the number continues to rise.

There are many benefits to doing business over the Internet, including:

- Increased potential customer base;
- Reduced paperwork and administration;
- Reduced time taken to receive orders, supply goods and make and receive payments; and
- Access to a greater range of suppliers.

As well as sending emails and browsing the Internet, specialised business applications you may wish to consider include:

- E-banking (organising your accounts and paying bills);
- E-shopping (purchasing goods from a merchant's website);
- E-tailing (selling goods to shoppers from your website);
- Sending and receiving orders to and from business partners; and
- Lodging your tax return or business activity statement (BAS), or conducting other transactions with government agencies.

## 10.6 Summary

Electronic Payment 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. Whereas E-security is the process of ensuring the confidentiality, integrity, and availability of electronic information and protecting it against malicious attackers who could use or alter the information to disrupt critical national infrastructure and industry.

## 10.7 Self Assessment Questions

1. What do you mean by "E-Payments". Explain in detail.
2. What is risk ? Explain the various types of risk involved in e payments.
3. Write a note on advantages and disadvantages of electronic payment system.

4. What are the components of Electronic payment system ? Explain the difference between the tradition payment system and electronic payment system.

5. Define E-security ? Explain the need of e security.

6. write short note no the following :

   1. How to prevent fraud
   2. Operational risk
   3. Credit risk

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# Unit - 11 : E-Commerce and Supply Chain Management

**Structure of unit:**



## 11.0 Objectives

After completing this unit, you would be able to:

- Understand the meaning of supply chain
- Understand the concept of supply chain management (SCM)
- Differentiate between supply chain management and logistics management
- Learn the meaning to value chain
- Know the concept of e-business
- Understand the importance of e-business in SCM
- Learn the steps of implementation of SCM

## 11.1 Introduction

There is always a question what supply chain management is. Almost all of us using the name supply chain management as a synonym for logistics. But actually supply chain management is modern nomenclature for purchasing or operations, or the combination of purchasing, operations and logistics.

## 11.2 Supply Chain

A supply chain is a process in which product and services transform from supplier to customer in association with of organization, people, technology, activities, information and other resource. In supply chain raw materials are converted into finished goods to deliver them to final consumer. Hence, supply chains includes the business units and the business activities needed to design, make, deliver, and use a product or service. For survival business are dependent on the supply of material either raw or finish goods. Even many businesses are depend on more than one supply chains for successfully run their business. Due to the high competitive market to run business effectively and successfully it is very important for companies to be alert about their supply chain. Those companies that learn how to develop and participate in strong supply chains will have a substantial competitive advantage in their markets. This importance of supply chain, evoke the new concept of supply chain management. Supply chain management views the supply chain and the organizations in it as a single entity. It brings a systems approach to understanding and managing the different activities needed to coordinate the flow of products and services to best serve the ultimate customer. This systems approach

provides the framework in which to best respond to business requirements that otherwise would seem to be in conflict with each other.

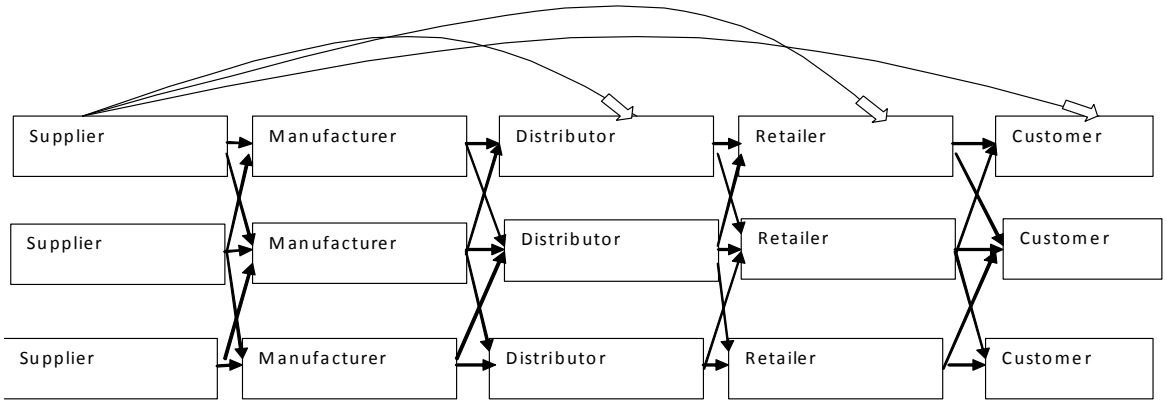


**Figure - 11.1**

**Activity A**

1. Describe supply chain. Explain any example of supply chain which you observe in your surroundings.

## 11.3 Difference Between Supply Chain Management and Logistics Management

| **Supply Chain Management (SCM)** | **Logistic management (LM)** |
|---|---|
| SCM is modern concepts | LM is traditional concepts |
| Supply chains refer to networks of companies that work together and coordinate their actions to deliver a product to market | Logistics refers to activities that occur within the boundaries of a single organization |
| Successful supply chain management requires cross-functional integration of key business processes within the firm and across the network of firms that comprise the supply chain. | Traditional logistic does not required cross-functional integration. |
| Supply Chain includes suppliers, manufacturers, distributors, retail outlets, and customers that use transactions to purchase, convert/manufacture, assemble or distribute goods and services to the consumer or end user | Logistics is that part of the supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point-of-origin and the point-of-consumption in order to meet customers' requirements |
| A supply chain consists of all the paths that allow for business transactions within a given corporate structure. | Traditional logistics covers only transform of goods to the consumer |
| Supply chain management acknowledges all of traditional logistics and also includes activities such as marketing, new product development, finance, and customer service. | Traditional logistics focuses its attention on activities such as procurement, distribution, maintenance, and inventory management |

**Activity B**

1. What is supply chain management? Contrast it with business logistics management.

## 11.4 Supply Chain Management

There is a basic pattern to the practice of supply chain management.

The major issues in every supply chain management are remaining same, being that there are unique set of market demands and individuals challenges for every supply chain. Companies in any supply chain must make decisions individually and collectively regarding their actions in five areas:

**1. Production:** Production is an important decision in supply chain management. A business unit has to take decision regarding what type of product market wants and what do produce. Which is the right time to produce the product? Company has to plan the production schedules workload balancing, quality control, and equipment maintenance.

**2. Inventory:** At every phase in a supply chain what inventory should be stored? Business unit has to take decision what type of material (raw materials, semi-finished, or finished goods) should be held as inventory. The primary purpose of inventory is to act as a buffer against uncertainty in the supply chain. However, holding inventory can be expensive, so what are the optimal inventory levels and reorder points?

**3. Location:** Where should facilities for production and inventory storage be located? Where are the most cost efficient locations for production and for storage of inventory? Should existing facilities be used or new ones built? Once these decisions are made they determine the possible paths available for product to flow through for delivery to the final consumer.

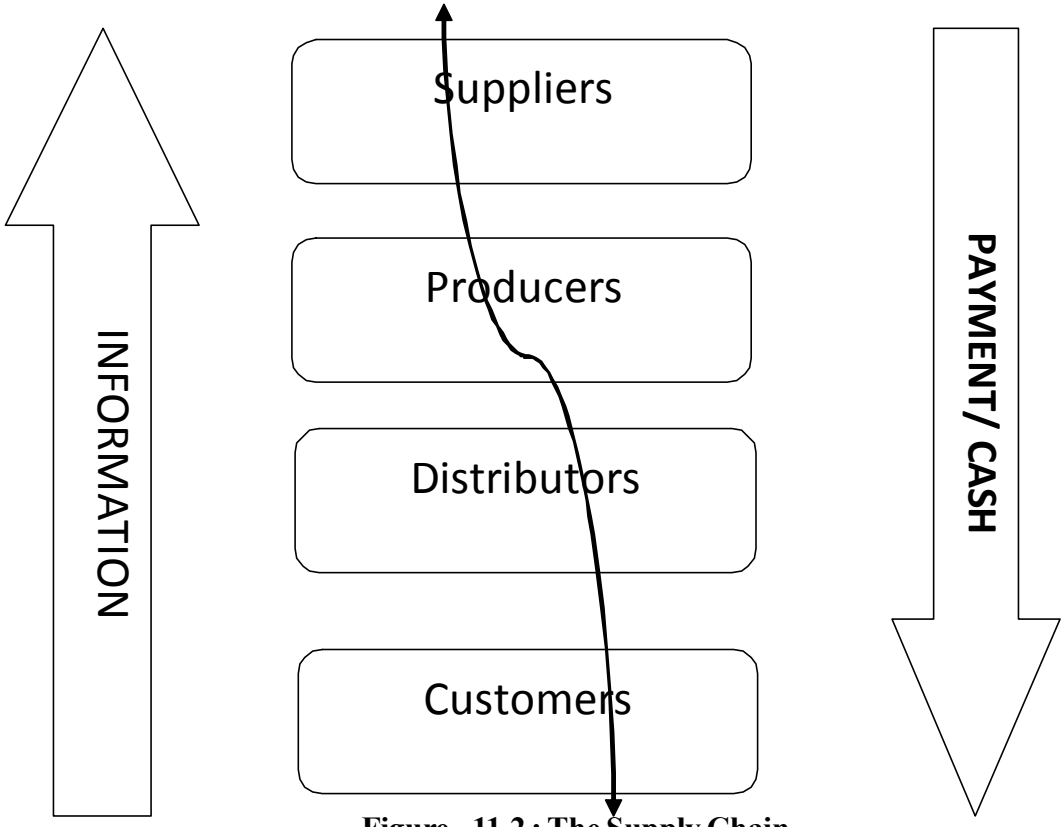


**Figure - 11.2 : The Supply Chain**

**4. Transportation:** it is important to take decision which mode of transportation is better to move the goods from one place to another. Air freight and truck delivery are generally fast and reliable but they are expensive. Shipping by sea or rail is much less expensive but usually involves longer transit times and more uncertainty. This uncertainty must be compensated for by stocking higher levels of inventory. How should inventory be moved from one supply chain location to another?

5. Information: What type of information should be shared and how much information should be shared? How much data should be collected? Timely and accurate information holds the promise of better coordination and better decision making.

Proper and accurate information helps the consumer and producer both. Producer can make right decision about what to produce and how much to produce. It also assist to locate inventory and to suggest best mode of transport.

The sum of these decisions will define the capabilities and effectiveness of a company's supply chain. The things a company can do and the ways that it can compete in its markets are all very much dependent on the effectiveness of its supply chain. If a company's strategy is to serve a mass market and compete on the basis of price, it had better have a supply chain that is optimized for low cost. If a company's strategy is to serve a market segment and compete on the basis of customer service and convenience, it had better have a supply chain optimized for responsiveness. Who a company is and what it can do is shaped by its supply chain and by the markets it serves.

**Activity C:**

1. Consider the purchase of a soft drink at a departmental store. Explain the various stages in the supply chain and the different flow involved.

## 11.5 Value Chain

Michael Porter is was the first person who has explained the term 'Value Chain' in his popular book "Competitive Advantage: Creating and Sustaining superior Performance" in year 1984

All those activities that an organization performs and related to the organization competitive position is describe as Value Chain. We can say that a value chain is a series of actions that an organization performing in order to deliver product and service to the end user. A business unit is appropriate level for construction of a value chain, not divisional or corporate level. Products transfer from different stages of a chain in steps, and at every stage the product acquired some value. There is an addition of value in overall product than sum of the independent activities' values. Value chain analysis describes the activities within and around an organization, and relates them to an analysis of the competitive strength of the organization. Therefore, it evaluates which value each particular activity adds to the organizations products or services. This idea was built upon the insight that an organization is more than a random compilation of machinery, equipment, people and money. Only if these things are arranged into systems and systematic activates it will become possible to produce something for which customers are willing to pay a price. Porter argues that the ability to perform particular activities and to manage the linkages between these activities is a source of competitive advantage.

***For Example:*** A gold smith, as a profession, can be used to illustrate the difference of cost and the value chain. The finishing and designing activity may have a low cost, but the activity adds much of the value to the end product, since a rough gold is significantly less valuable than a beautiful necklace.

Similarly quality certifications in business activities either on the process or on the product increase the value of the final product like certification from International Organization for Standardization (ISO). ISO International Standards ensure that products and services are safe, reliable and of good quality. For business, they are strategic tools that reduce costs by minimizing waste and errors and increasing productivity and increase the value of the product or services. They help companies to access new markets and to enter into a higher segment.

| Popular Standards | |
|---|---|
| ISO 31000 | Risk management |
| ISO 9000 | Quality Management |
| ISO 26000 | Social responsibility |
| ISO14000 | Environmental Management |
| ISO 22000 | Food and safety management |
| ISO 50001 | Energy Management |

All these added some values in the product and services either at primary or at secondary levels.

There are two types of value addition Primary activities and Secondary (Support) activities

The "primary activities" include: inbound logistics, operations (production), outbound logistics, marketing, sales, and service. Primary activities are directly related with the developing, creation or delivery of a product or service. They are grouped into five main areas: inbound logistics, operations, outbound logistics, marketing and sales, and service. Each of these primary activities is linked to support activities which help to improve their effectiveness or efficiency.

Support activities are those activities which covers four main areas like procurement, technology development (including R&D), human resource management, and infrastructure (systems for planning, finance, quality, information management etc.).

For a better product and services consumer can even pay more. For which organization has to add some value in the product and to manage the linkage between the all activities in the value chain which may increase the cost of the product or services but the sum of the costs of all activities in the value chain is lesser than the what a consumer pay for the this higher value this profit margin is known as margin.

Linkage among the various steps in the chain is very important and crucial for corporate success. The linkages are about faultless collaboration and information flow between the value chain activities. The linkages are flows of information, goods and services, as well as systems and processes for adjusting activities. Their importance is best illustrated with some simple examples:

Only if the Marketing & Sales function delivers sales forecasts for the next period to all other departments in time and in reliable accuracy, procurement will be able to order the necessary material for the correct date. And only if procurement does a good job and forwards order information to inbound logistics, only than operations will be able to schedule production in a way that guarantees the delivery of products in a timely and effective manner – as pre-determined by marketing.

It is not possible by a single company to design the product, to do production and final assemble of product or even deliver the same product to the final consumer. Most often, organizations are elements of a value system or supply chain. Hence, value chain analysis should cover the whole value system in which the organization operates.

Within the whole value system, there is only a certain value of profit margin available. This is the difference of the final price the customer pays and the sum of all costs incurred with the production and delivery of the product/service (e.g. raw material, energy etc.). It depends on the structure of the value system, how this margin spreads across the suppliers, producers, distributors, customers, and other elements of the value system. Each member of the system will use its market position and negotiating power to get a higher proportion of this margin. Nevertheless, members of a value system can cooperate to improve their efficiency and to reduce their costs in order to achieve a higher total margin to the benefit of all of them (e.g. by reducing stocks in a Just-In-Time system).

***A typical value chain analysis can be performed in the following steps:***

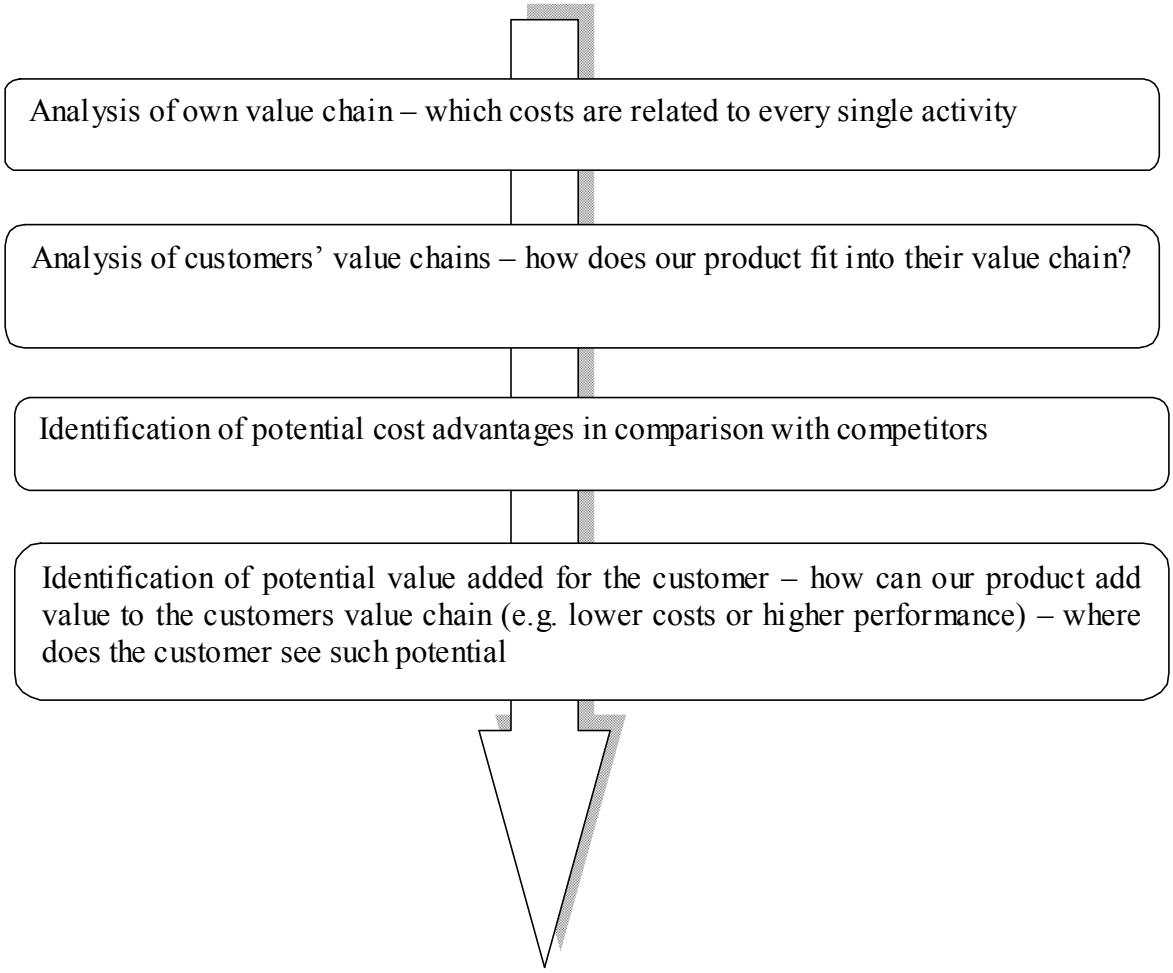


**Figure 11.3**

**Activity D:**

1. What do you mean by Value Chain? Explain it by taking an example of automobile company.

## 11.6 Restructuring the Supply Chain and Application of e-business

The Internet has grown rapidly over the last 15 years. It is predicted that more than 500 million households will be connected to the World Wide Web by 2015. This internet has a vital role in business-to-business supply chain applications. Internet has speeded up communication between customers and their producers, improving service performance, and reducing logistics costs.

The Internet is transforming the mode companies perform business. We argue that the value of the Internet for a firm is strongly dependent on the firm's industry and on the strategy it pursues. A survey of firms with an online presence displays wide disparities in performance Firms that fully exploit the revenue enhancements and cost reduction opportunities offered by the Internet and optimally integrate e-business with existing channels are likely to be the big winners in the Internet age. Internet usage allows intermediate players in a supply chain to be bypassed.

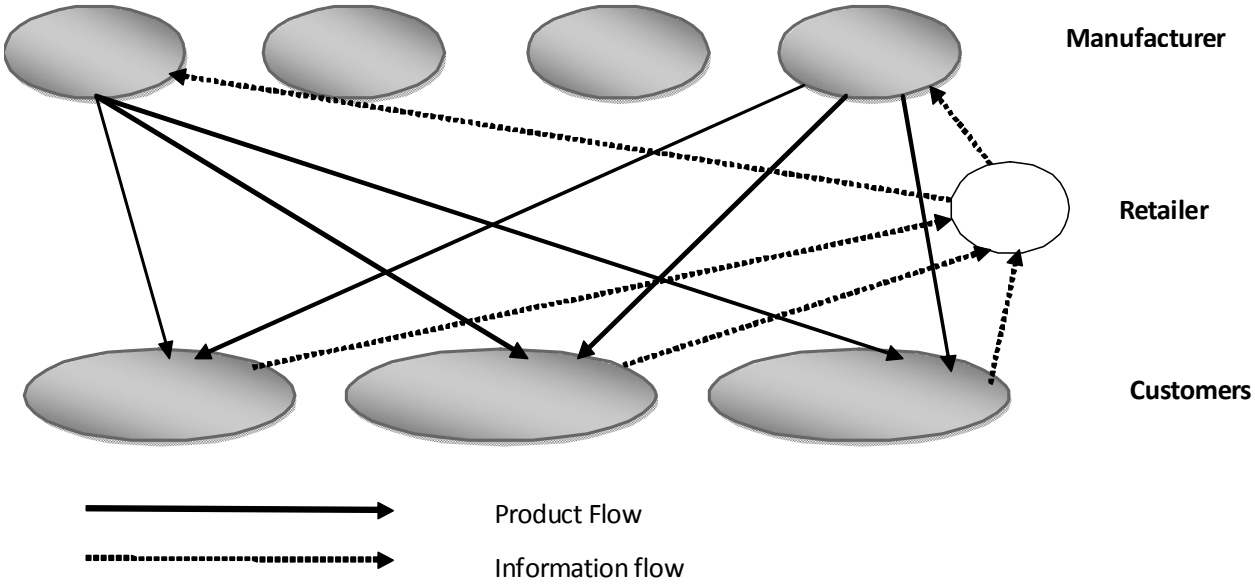


**Figure 11.4**

Many Internet business models take advantage to eliminate wholesalers and retailers by reaching the customer directly. Additional Supply Chain processes — such as marketing and purchasing — are managed horizontally across a company to minimize unnecessary delays, interruptions, and uncertainty. The success of an integrated Supply Chain depends upon excellent communication and commitment from top management.

E-commerce does not just mean trading and shopping on the Internet. It means business efficiency at all operation levels. Supply Chain Management means coordinating, scheduling and controlling procurement, production, inventories and deliveries of products and services to customers. The SCM is the backbone of E-commerce, a very critical component of E-commerce. Supply Chain Efficiency means having the right product at the right place at the right time, can save money/reduce costs, and can enhance cash utilization.

### 11.6.1 The Role of E-business in a Supply Chain

E-business involves the execution of business transactions over the Internet. Companies conducting e-business perform some or all of the following activities over the Internet across the supply chain:

- Providing product and other information
- Negotiating prices and contracts
- Placing and receiving orders
- Tracking orders
- Filling and delivering orders
- Paying and receiving payment.

All these activities have been conducted in the past using existing "channels" such as retail stores, sales people, and catalogs. For example, companies like Coxs & Kings and SOTC have used catalogs to provide tourism and service information to Clients. Previously customers book their journey through travel agents and mediators but know they can booked their travel plan as per their choice direct from these companies website and even plan past their complain and enquiry through online. Now, different firms can best use the strengths of the Internet to enhance the performance of their supply chains.

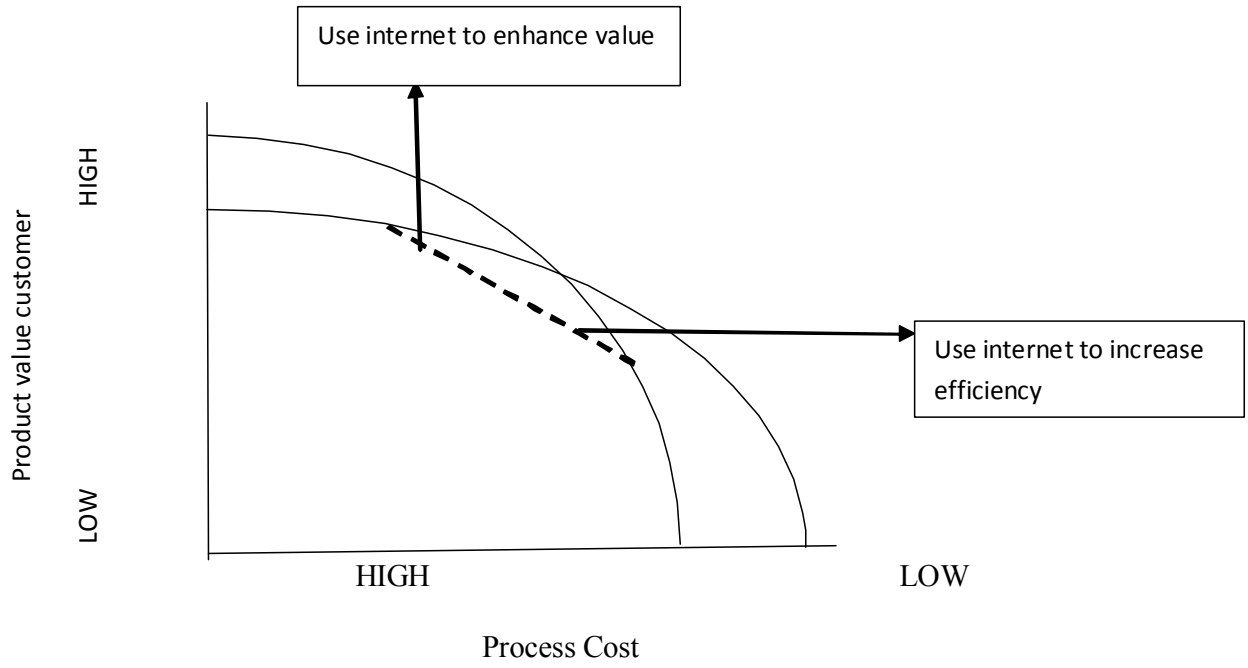


**Figure - 11.5 : The Impact of E-business on Supply Chain Performance**

*E business has great impact on supply chain management. They are as follow:*

**Revenue Impact of E-business:** E-business allows firms to enhance revenues by direct sales to customers. Manufacturers and other members of the supply chain that do not have direct contact with customers in traditional retail channels can use the Internet to shrink the supply chain by bypassing retailers and selling direct to customers. For example, Dell Computers sells PCs online direct to customers. As a result, Dell can enjoy higher margins than traditional PC manufacturers that must share some margin with retailers.

**Price and Service Customization:** Negotiating prices and contracts with customers and suppliers on-line allows price and service customization. By accommodating individual requests, the product/service may be customized and priced accordingly. Keeping customer profiles and having them "log-in" facilitates such price and service discrimination by allowing subsequent class or customer specific routing. Individualizing the purchasing experience for each customer is difficult in a physical store where the store layout cannot be changed for each individual customer.

**Price and Service Discrimination:** An e-business could price discriminate and alter prices based on the buying power of individual customers to enhance revenues. Auctions sites like eBay and exchanges like Commerce One allow people to bid for goods and services with different people potentially paying different prices. Other e-businesses offer customers a menu of services at different prices, allowing them to select the desired level of service. For example, Amazon.com provides a customer ordering multiple books with shipping times for each book. Some titles may be available for next day shipping while others involve a weeklong lead-time. Customers can choose to receive one order after a week at a lower price, or separate shipments in order of availability at a higher price.

**Global Access:** Global access at any time from any place in terms of order placement allows an e-business to enhance revenues by attracting customers who may not be able to place orders during regular business hours. For example, customers can place orders at industrial supplier Grainger.com, even when the Grainger stores where they will pick up their orders are closed. Grainer has observed a surge in online orders after their stores close.

**Cost Impact of E-business**

***Facility Costs:*** Facility costs include both site and processing costs. E-businesses are able to centralize facilities because online sales allow the separation of order placement and order fulfillment. Site costs may decrease as direct customer-manufacturer contact and geographical centralization eliminates or reduces retail sites.

***Inventory Costs:*** Many e-businesses can centralize inventories because they do not have to carry inventory close to the customer. This geographical centralization reduces required inventory levels because of increased economies of scale in the supply and reduced aggregated variability in the demand.

***Transportation Costs:*** One should differentiate inbound from outbound transportation. A firm incurs inbound transportation costs to bring a replenishment order in from a supplier while it incurs outbound transportation costs to deliver the product to the customer. Typically, replenishment orders enjoy lower unit transportation costs than customer orders because of scale economies. Physical centralization increases the distance traveled by a customer order, while decreasing the distance traveled by a replenishment order. Thus, compared to a business with several physical outlets, an e-business will tend to have higher transportation costs per unit. Clearly, transportation costs are eliminated for downloadable information goods. The most popular use of the Internet in supply chains is in the management of transport.

**Information Sharing Improves Supply Chain Coordination:** An e-business can easily share demand and other information (such as inventory positions) across the supply chain to dampen the bullwhip effect and improve coordination. Sharing planning and forecasting information further improves coordination and reduces overall supply chain costs while better matching demand with supply. Information processing costs also tend to be lower for an e-business if it has successfully integrated systems across the supply chain.

**Purchasing and the e-business:** The use of the Internet in managing purchasing in the supply chains has developed rapidly. The Internet is utilized in a variety of procurement applications including the communication with vendors, checking vendor price. The purchasing function has been streamlined through the use of the Internet. General Electric, for example, has reduced its purchasing staff by more than 50 percent and permits on-line purchasing from vendor catalogs by each department. The paperwork flows have been reduced, and order-cycle times— the time from when the order is purchased to the time it is delivered to the company—has decreased by 40 percent. Vendor negotiation has also been streamlined through the use of the Internet. Face-to-face negotiations are not used as frequently because the negotiations can conducted through the Internet. This includes the bargaining, re-negotiation, price, and term agreements.

**Inventory Management and the e-business:** One of the most costly aspects of supply chains is the management of inventory. The research has shown that the most popular use of the Internet in this area is the communication of stock-outs by customers to vendors, or the notification of stock-outs by companies to their customers. The Internet has enabled companies to more quickly institute EDI information programs with their customers. Prior to the development of the Internet, EDI took a long time to implement in a supply chain. Each channel member had to invest heavily in equipment, software, and training before EDI systems could be made operational.

This is similar to the situation with JIT delivery programs. Ever since the introduction of the Internet, JIT and EDI systems take only half of the needed time to develop and to be put into operation. The Internet has affected inventory management most dramatically in the ability of firms to be proactive in the management of inventory systems. This is demonstrated in the ability of firms to notify customers of order-shipping delays and inventory emergencies. The research showed that the information available to inventory managers is becoming more readily available because of the reporting systems that can be used through the Internet.

This includes finished-goods inventory levels at manufacturing and field level depots along with raw material levels at central and regional assembly locations. The Internet also provides managers with the ability to track out-of-stock inventory items in field depots. The overall benefit of the Internet to firms in managing inventory in their supply chains is to keep inventory levels low, reduce overall holding costs, and still provide high levels of customer service.

**Order Processing and the e-commerce:** Another most popular use of the e-commerce in supply chains is in order processing applications. The most frequent use of the e-commerce here is in order placement and order status. Over half of the firms use the Internet for this purpose. This has dramatically reduced the costs of order processing, which before the Internet accounted.

**Customer Service and the e-commerce:** The Internet has provided firms with the ability to offer their customers another way to contact the firm regarding service issues. The Internet also gives customers 24-hour access to a company's service department, enabling customers to immediately notify companies of any service issues or problems that may arise. The overall effect has led to reduced response times and resolutions of customer service problems. The Internet has improved the two-way flow of communication between firms and their customers. Experience with Internet service systems shows that customers whose service issues are dealt with quickly and to their satisfaction, are more likely to want to purchase the firm's products again. The Internet can build strong product and service loyalty if used appropriately in the customer service area.

**The e- commerce and Production Scheduling:** Production scheduling has traditionally been the most difficult aspect of SCM. The reasons for this include: (1) the high level of inaccuracy of sales forecasts; (2) the lack of raw material information from vendors; and (3) the general paucity of information regarding fluctuations in vendor-stock levels and customer demand.

**Activity E:**

1. Locate an e-market place site on the internet and describe it and the type of producers and suppliers it connects.

## 11.7 Supply Chain Management Implementation

There is no "proven path" to implementing SCM. There are so many operational and strategic facets to SCM that any given implementation can take an infinite variety of forms, progress through radically different stages, and result in several different outcomes. However, broadly speaking, SCM implementations should focus on these steps:

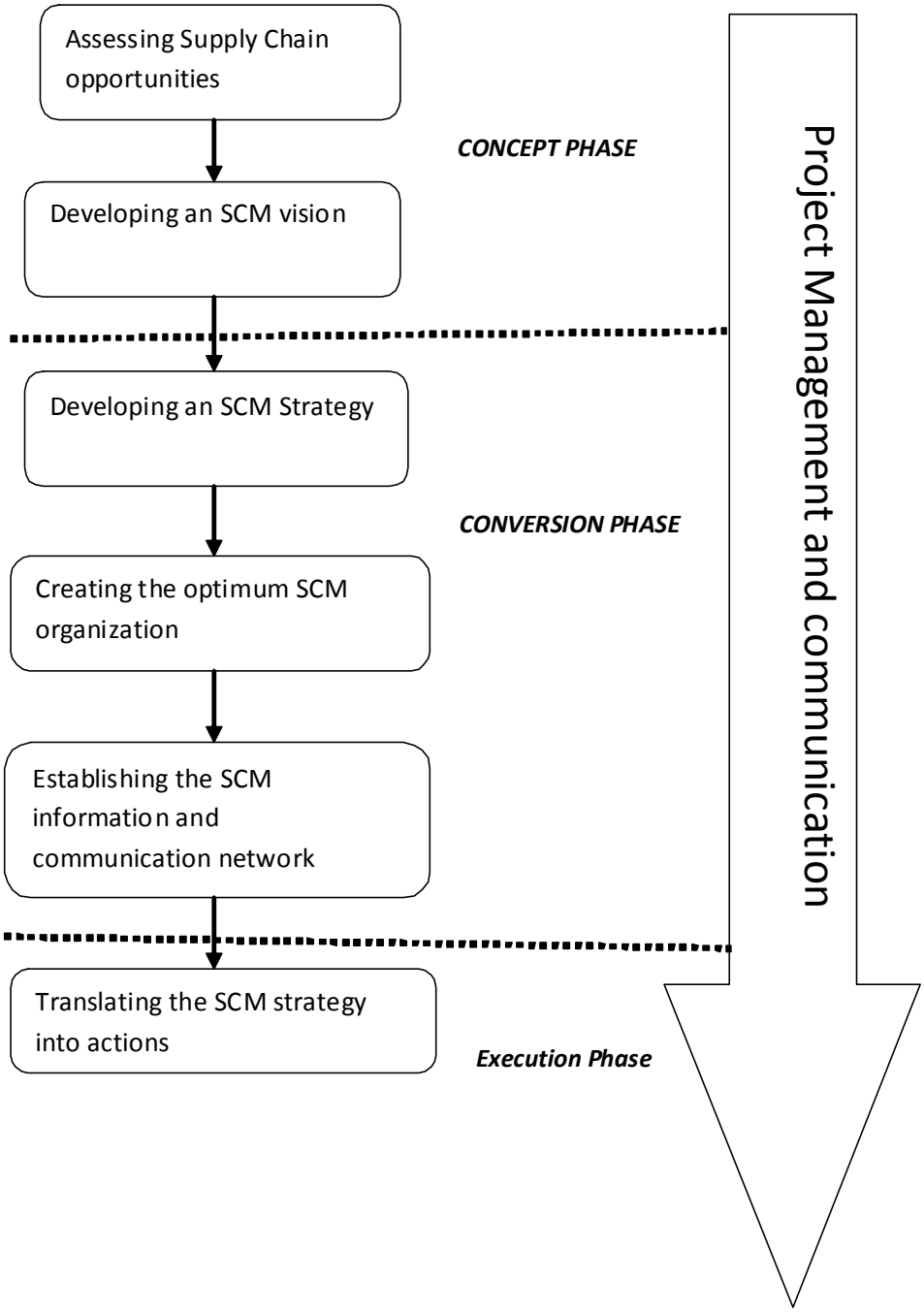


**Figure - 11.6 : SCM Implementation Steps**

- assessing supply chain opportunities;
- developing an SCM vision;
- developing an SCM strategy;
- creating the optimum SCM organizational structure;
- establishing the SCM information and communication network; and
- translating the SCM strategy into actions.

While organizations can modify the sequence and emphasis placed on these steps to meet the needs of a particular situation, these activities are recommended as a guide for implementing SCM. These steps are illustrated in diagram.

**Assessing Supply Chain Opportunities** Changing consumer demographics, the emergence of new distribution channels, the consolidation of trading partners, and the increasing use of computer and telecommunications technology are creating a changing environment for organizations. Each of these factors is producing new challenges and new supply chain opportunities.

An effective way to begin assessing supply chain opportunities is by forming an organization-wide steering committee that oversees all related project activities, challenges the basis of recommendations, and approves final recommendations and implementation plans.

The focus of the assessment team must be on facts rather than guesswork or emotions. Several categories of information need to be gathered and analyzed including:

- competitiveness of the organization;
- consumer and trading partner preferences;
- the strength of the brand or the product line;
- the impact on production and logistics operations; and
- risks and rewards.

**Developing an SCM Vision** Step two in the implementation process is to create a vision of the desired supply chain. Visioning provides organizations with specific goals and strategies on how they plan to identify and realize the opportunities they expect to find in the marketplace. Supply chain visioning is most successful when it is customer focused, strategy driven, and outcome based. Specifically, the supply chain vision should be built from a clear understanding of customer needs and how well the existing supply chain is meeting those needs. Four critical dimensions to be included in formulating an SCM vision are:

- sourcing;
- demand flow;
- customer service; and
- supply chain integration.

These objectives are achieved through careful analysis, collaboration, and communication among supply chain partners. Each dimension of the visioning process brings new perspective and progress toward these objectives.

**Developing an SCM Strategy:** Once the SCM vision has been developed, attention turns toward creating a comprehensive value-added SCM strategy. An SCM strategy must create maximum economic value for the customer. It should also provide a win-win situation for both the manufacturer and value-adding channel participants, creating growth opportunities for each participant. The ultimate goal, to develop a trust-based relationship among all parties, is based on a system of mutual support, effort, and benefit.

SCM strategies provide the basis for developing a clear direction for the supply chain that helps identify current levels of awareness and dedication to the underlying vision and objectives of the supply chain network. Second, expansion of the core supply chain strategy to reflect detailed channel strategies will provide the means to develop performance metrics, feedback, evaluation, and improvement initiatives.

**Creating the Optimum SCM Organizational Structure:** Once the SCM strategy has been articulated and accepted, the next task is to define how the customers' needs will be met at each stage of the supply pipeline, as well as who among the participants can best fulfill that need. One school of thought is that each supply chain needs an anchor organization with almost dictatorial power to orchestrate the actions of trading partners. Others argue that many supply chains are too complex for a single trading partner to have a large impact, and that inter-organizational cooperation is required to make significant changes. In support of the anchor organization, proponents point to the automobile industry's implementation of JIT, which was initiated by the large assemblers and disseminated to the tier 1 suppliers. In turn, tier 1 suppliers shared this largess with the tier 2 suppliers and so on throughout the supply chain. As the anchor organization, automobile assemblers not only had the power to dictate the necessary changes for JIT among its suppliers but also forced its customers to buy cars made-to-demand rather than made-to-order. In other supply chains, large retailers such as Wal-Mart and Home Depot play the role of the anchor organization, demanding special packaging, pricing, delivery, and inventory practices.

**Establishing the SCM Information and Communication Network:** The thread that draws channel partners together is a common objective and its communication. Information, and the tools and technologies that create it, provide the means to bridge organizational boundaries and support inter-organizational learning. The development of a robust information and communication network aids SCM participants in achieving several critical supply chain requirements, as illustrated in Exhibit 8.

Several primary features define effective SCM information and communication systems including:

- they are based on distributed open systems, or "client/server" architectures that will allow business systems as well as personal computers to "talk" with one another;
- distributed relational database technology under lies the network structures allowing for ready access and transparent use by individuals and enterprises in any location;
- systems span inter-enterprise functional boundaries and enable the development and structuring of global channel-wide information networks, allowing companies to share information regarding customer s, production, inventory, and finance with their supply chain partner s; and
- these systems are able to process transactions from multiple organizations and infrastructures rapidly and accurately.

**Translating SCM Strategies into Actions:** For most organizations, implementing an SCM strategy spanning material and product flow from vendor s to final consumption, across an array of different organizations or functional groups, is a complex task. While the specific implementation path will vary by organization over the months and years following the definition of an SCM vision and strategy, a range of actions are required by channel partner organizations, including:

- appointing a process owner;
- aligning culture with strategic response;
- reengineering critical business processes;
- measuring performance;
- developing and training the workforce;
- communicating and demonstrating senior management commitment;

- involving stakeholders and gaining commitment to change;
- implementing a system to track benefits;
- communicating with all stakeholders; and
- creating integration map.

**Activity F:**

1. "Proper implementation of SCM is more important than formation". Explain

## 11.8 Summary

The implementation e- business in a supply chain management system in a company is a trivial thing. It is related to company management style, company's business strategy, its IT system and many others. Of course, there is a suggested (and practically validated) way to implement e-business in supply chain management system. In fact, there are many ways company can benefit from the e-commerce its implementation on supply chain management. Setting up a supply chain management system for a company is like to put an electronic door to a company. Company can communicate with outside world via the electronic door while keep its preferred management strategy inside.

## 11.9 Self Assessment Questions

1. Which is supply chain?
2. Differentiate between supply chain management and logistics management.
3. What do you mean by supply chain management by taking an example of reliance fresh?
4. Is e-business likely to be more beneficial in the early part of the mature part of a product's life cycle? Why?
5. In the future, do you see the value added by distributors decreasing, increasing, or staying about the same?
6. Write a short note on supply chain management implementation.
7. What do you mean by 'Value Chain'? Explain with suitable examples.

## 11.10 References Books


- S Chopra, P Meidnl & D V Kalra,(2008), 'Supply Chain Management', Pearson publication Pvt Ltd, New Delhi
- R H Ballou & Samur K Srivastava(2009), 'Business Logistics/ Supply Chain Management', person publication Pvt. Ltd, New Delhi.
- R S Russell & B W Taylor III (2010), 'Operation Management' Person Publication Pvt Ltd New Delhi James F, and Willian C (1994) the logistic handbook New York, free

# Unit - 12 : E-Commerce and Customer Relationship Management

**Structure of Unit:**



## 12.0 Objectives

After completing this unit, you would be able to:

- Understand the meaning of CRM and E-CRM
- Explain the need of E-CRM
- Describe the framework and key features of E-CRM
- Explore the Similarities and Differences between CRM and E-CRM
- Outline the Components and Architecture of E-CRM
- To elaborate the Technology solutions for E-CRM

## 12.1 Introduction

In today's world a company can survive only if they can manage to keep its customers happy. Promising latest and top class success to customers, building a customer environment and using other means to maintain customer attention have now become the top priorities for any company that wants to make it big in the market.

As technology changes, more people all over the world have started buying and selling activities over the Internet. As a consequence companies also have to give customers a good in easy online environment. The result is nothing but E-CRM.

## 12.2 What is Customer Relationship Management?

**Customer relationship management** (**CRM**) has the business purpose of intelligently finding, marketing, selling and servicing customers. CRM is a broadly used term that covers concepts used by companies, and public institutions to manage their relationships with customers and stakeholders. Technologies that support this business purpose include the capture, storage and analysis of customer, vendor, partner, and internal process information. Functions that support this business purpose include Sales, Marketing and Customer Service, Training, Professional Development, Performance Management, Human Resource Development and compensation.

### 12.2.1 Definition of CRM

*"Customer Relationship Management is a comprehensive approach for creating, maintaining and expanding customer relationships .*

**Significance of the words used in the definitions:**

a. **Comprehensive:** CRM does not belong to just sales or marketing. It is not the sole responsibility of customer service group or an IT team; i.e. CRM must be a way of doing business that touches all the areas.

b. **Approach**: An approach is broadly a way of treating or dealing with something. CRM is a way of thinking about and dealing with the customer relationship. We can also use the word „strategy because CRM involves a clear plan. In fact, CRM strategy can usually serve as a benchmark for other strategies in your organization, because any strategy sets directions for your organization. We can also consider this from a department or area level. Just as a larger organization have strategies for shareholder management, marketing etc. Each strategy must support managing customer relationships. Thus CRM is strategic. To realize this, one can make a list of key strategies, to brief your area of responsibility. Then write down organizational approach towards customers. Compare the CRM strategies with other strategies. They should support each other. External customers are those outside the organization who buy goods and the services the organization sales. „Internal customers is a way of defining another group in some organization whose work depends upon work of your group. Therefore, they are your customers. It is your responsibility to provide what they need so that they can do their job properly.

c. **Customer Relationship:** Finally let us see what we mean by "customer relationship". In today's world where we do business with individuals or groups with whom we may never meet and hence much less know in person-to-person sense. CRM is about creating the feel of comfort in this high tech environment.

### 12.2.2 The four marketing activities that comprise CRM involve the following

1. **Customer Selection** means defining the types of customers that a company will market to. It means identifying different groups of customers for which to develop offerings and to target during acquisition, retention and extension.

2. **Customer Acquisition** refers to marketing activities intended to form relationships with new customers while minimizing acquisition costs and targeting high-value customers. Service quality and selecting the right channels for different customers are important at this stage and throughout the lifecycle.

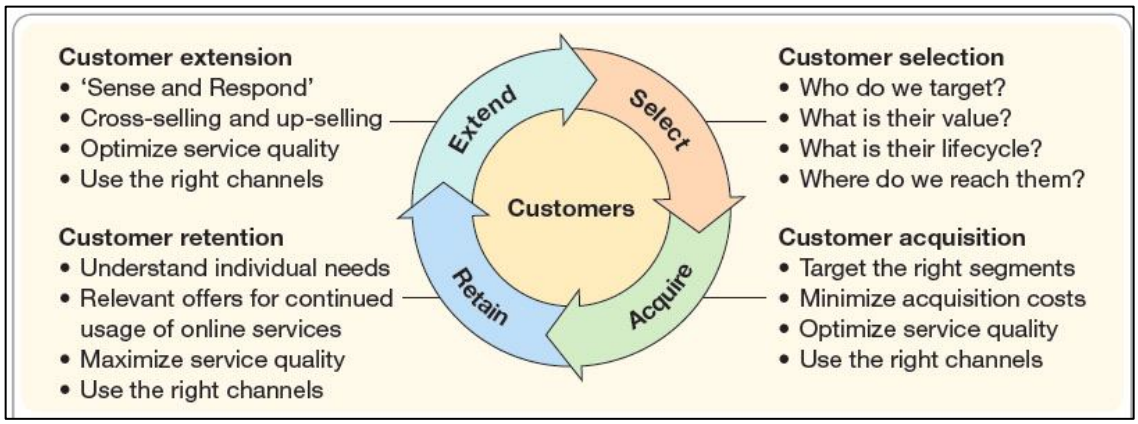


**Figure 12.1: The Four Classic Marketing Activities of Customer Relationship Management**

3. **Customer Retention** refers to the marketing activities taken by an organization to keep its existing customers. Identifying relevant offerings based on their individual needs and detailed position in the customer lifecycle (e.g. number or value of purchases) is key.

4. **Customer Extension** refers to increasing the depth or range of products that a customer purchases from a company. This is often referred to as 'customer development'. Customer extension has the aim of increasing the lifetime value of the customer to the company by encouraging cross-sales

   There are a range of customer extension techniques for CRM that are particularly important to online retailers:

   - **Re-sell**. Selling similar products to existing customers – particularly important in some B2B contexts as re-buys or modified re-buys.
   - **Cross-sell**. Sell additional products which may be closely related to the original purchase, but not necessarily so.
   - **Up-sell**. A subset of cross-selling, but in this case, selling more expensive products.
   - **Reactivation**. Customers who have not purchased for some time, or have lapsed, can be encouraged to purchase again.
   - **Referrals**. Generating sales from recommendations from existing customers, for example member-get-member deals.

### 12.2.3 Need of CRM

The experience from many companies is that a very clear CRM requirement with regards to reports, e.g. output and input requirements, is of vital importance before starting any implementation. With a proper demand specification a lot of time and costs can be saved based on right expectations versus systems capability. A well operative CRM system can be an extremely powerful tool for management and customer strategies.

**CRM is not just a technology but rather a comprehensive approach to an organization's philosophy in dealing with its customers.** This includes policies and processes, front-of-house customer service, employee training, marketing, systems and information management. Hence, it is important that any CRM implementation considerations stretch beyond technology, towards the broader organizational requirements.

The objectives of a CRM strategy must consider a company's specific situation and its customers needs and expectations.

The data gathered as a part of CRM must consider customer privacy and data security. Customers want the assurance that their data is not shared with third parties without their consent and not accessed illegally by third parties. Customers also want their data used by companies to provide a benefit to them.

**Figure - 12.2 :Customer Relationship Management**

## 12.3 Electronic Customer Relationship Management (E-CRM)

**Definition:** E-CRM provides companies with a means to conduct interactive, personalized and relevant communications with customers across both electronic and traditional channels. It utilizes a complete view of the customer to make decisions about the following.

- Messaging
- Promotional offers, and
- Channel delivery.

It synchronizes communications across otherwise disjointed customer-facing systems.

It asks for the permission of the potential customer before talking to him about product or services.

It focuses on understanding how the economics of customer relationships affect the business CRM strategy along with its electronic component constitutes E-CRM.

The trust of E-CRM is not what an organization is doing on the web but how fully an organization ties its online channel back to its traditional channel or customer touch points.

**More specifically, we can say that important e-CRM challenges and activities which require management are:**

- Using the *web site for customer development* from generating leads through to conversion to an online or offline sale using e-mail and web-based information to encourage purchase;
- Managing e-mail list quality (coverage of e-mail addresses and integration of customer profile information from other databases to enable targeting);
- Applying *e-mail marketing* to support up sell and cross-sell;
- *Data mining* to improve targeting;
- With a web site with **personalization** or **mass customization** facilities to automatically recommend

the 'next-best product';

- Providing *online customer service facilities* (such as frequently asked questions, callback and chat support) that help achieve conversion to sale (these can be triggered automatically so that visitors to a site who show high intent or distress through multiple page visits can be prompted to enter a chat session or a callback (staff resources may limit offering these to all site visitors);
- Managing *online service quality* to ensure that first-time buyers have a great customer experience that encourages them to buy again;
- Managing the *multi-channel customer experience* as customers use different media as part of the buying process and customer lifecycle.

### 12.3.1 Need of E-CRM

**(1)** The CRM offerings remain channel centric not customer centric.

**(2)** Contemporary customers facing traditional systems.

**(3)** Customer centric metrics is non-existence.

1. **The CRM Offerings Remain Channel Centric Rather Customer Centric:** Host CRM offerings focus in improving the effectiveness of the individual channel that their systems support. While this is a necessary step, it does not address the fundamental question of which customers should be targeted in the channel and how much should be invoked in them. At a typical bank, the majority of customers are unprofitable. Regardless of how efficient customer communications may be through any channel, these customers will remain unprofitable.
2. **Customer Centric Metrics Do Not Exist:** Most CRM offerings have weak metrics and measurement capabilities. Generally those with customer profitability return on investment of customer interaction and lifetime value of a customer because data needed for this falls outside the reach and design of channel centric system. Instead they focus on operational metrics such as wait time on calls, the number of annoyed callers. While these metrics are important to run various channels operationally, they fail to address the question. Are we investing the right amount of resource on customers with the most value? Answering the question requires a holistic view of customer experience.
3. **Customer Facing Systems Create New Islands of Non-Integrated Information:** Contemporary customers facing traditional systems such as sales force automation and customer care often have their own data models and data stores that manage only the information that their application requires and generates. These systems rarely interact with others, as they remain isolated.

   **Example:** A customer, who has ordered a product and has a question about the status of that order, rather than calling a customer service number, the customer is able to return to the web site and inquire about the order through self service, which queries the company's order processing system automatically to return the status of the order. The customer can do this whenever it is convenient, and the company saves thousands of dollars in customer service costs.

## 12.4 Conversion Marketing

For managers to assess and improve the effectiveness of their customer relationship management implementation, evaluation using the conversion marketing concept is useful. In an online context, this assesses how effective marketing communications are in converting:

- Web browsers or offline audiences to site visitors;
- Site visitors to engaged site visitors who stay on the site and progress beyond the home page;
- Engaged site visitors to prospects (who are profiled for their characteristics and needs);
- Prospects into customers;
- Customers into repeat customers.

## 12.5 Online Buying Process

Companies that understand how customers use the new media in their purchase decision making can develop integrated communications strategies that support their customers at each stage of the buying process. Considering mixed-mode buying or how a customer changes between an online channel and an offline channel during the buying process is a key aspect of devising online marketing communications since the customer should be supported in changing from one channel to another.

The simple model of the buying process shown in *Figure 12.3* is valuable in developing the right online marketing tactics to support each stage of the process for each business.

Individual preferences for using the web will also differ. Lewis and Lewis (1997) identified five different types of web users who exhibit different **searching behavior** according to the purpose of using the web.

- **Directed Information-Seekers:** Will be looking for product, market or leisure information such as details of their football club's fixtures. This type of user tends to be experienced in using the web and is proficient in using search engines and directories.
- **Undirected Information-Seekers:** These are the users usually referred to as 'surfers', who like to browse and change sites by following hyperlinks. This group tends to be novice users (but not exclusively so) and they may be more likely to click on banner advertisements.
- **Directed Buyers:** These buyers are online to purchase specific products. For such users, brokers or cyber mediaries who compare product features and prices will be important locations to visit.
- **Bargain Hunters:** These users want to use the offers available from sales promotions such as free samples or prizes.
- **Entertainment Seekers:** Users looking to interact with the web for enjoyment through entering contests such as quizzes.

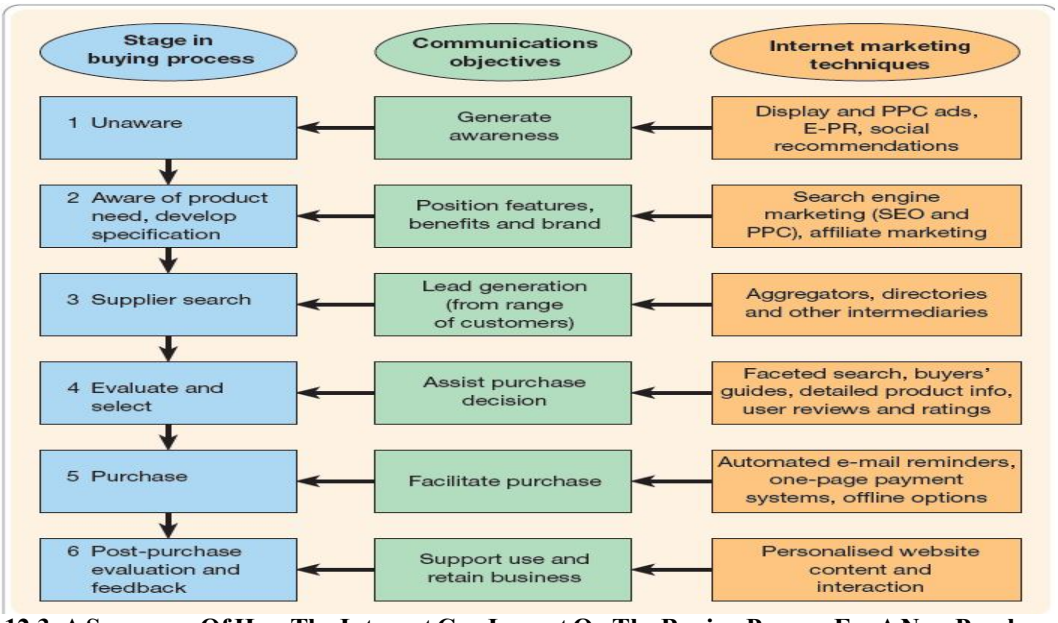


**Figure 12.3: A Summary Of How The Internet Can Impact On The Buying Process For A New Purchaser**

## 12.6 Framework of E-CRM

Companies need to take firm initiatives on the E-CRM frontier to

- Optimize the value of interactive relationship

  E-CRM must address customer optimization along three dimensions. The three dimensions are:

  a. **Customer Acquisition Management:** In an online context, 'customer acquisition' can have two meanings. First, it may mean the use of the web site to acquire new customers for a company as qualified leads that can hopefully be converted into sales. Second, it may mean encouraging existing customers to *migrate* to using online for purchase or service. Many organizations concentrate on the former, but where acquisition is well managed, campaigns will be used to achieve online conversion. Before an organization can acquire customers through the content on its site, it must, of course, develop marketing communications strategies to attract visitors to the web site.

  b. **Expansion:** increasing probability by encouraging customer to purchase more products and services

  c. **Customer Retention Management:** increasing the amount of time that customer stays.

     For an e-commerce site, customer retention has two distinct goals:

     1. To retain customers of the organization (repeat customers).
     2. To keep customers using the online channel (repeat visits).

- Enable the business to extend its personalized reach.
- Coordinate marketing initiatives across are the customer channels.
- Leverage customer information for more effective e-marketing and e-business.

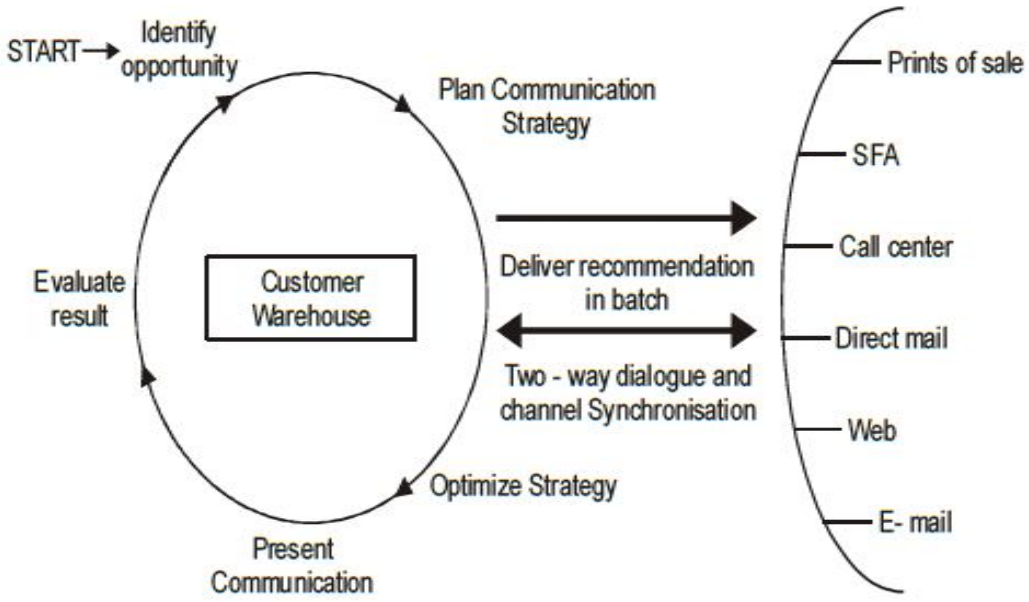


**Figure - 12.4 : Complete Framework Of E-CRM**

The above diagram depicts the complete framework for E-CRM. The left-hand cycle represents the set of e marketing and offline marketing functions. These functions utilize a single view of the customer, contained in the central data warehouse. The right side shows a sampling of customer channels, containing both electronic applications such as the web and personalized email as well as traditional direct mail. The one-way arrow in the middle of the schematic illustrates one-way batch outputs to the channels. The two-way arrow depicts bi-directional customer communications in real-time, and the synchronization of communications across channels.

## 12.7 Key features of E-CRM

- Driven by a data warehouse.
- Focused on consistent metrics to assess customer actions across channels.
- Built to accommodate the new market dynamics that place the customer in control.
- Structured to identify a customer's profitability and to determine effective investment allocation decisions accordingly, so that most profitable customer could be identified and retained.

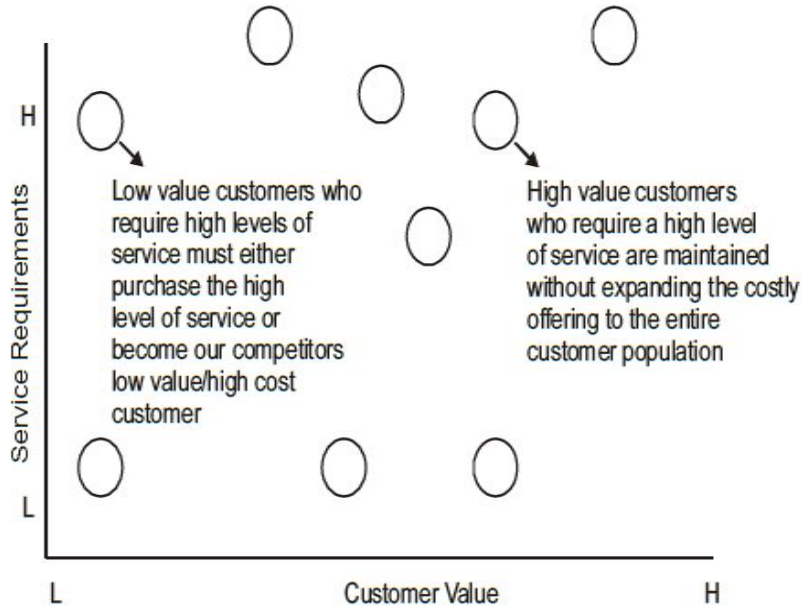


**Figure -12.5 : Relationships Between Customer Value and Service Requirement**

## 12.8 Six "E's" of E-CRM

The business types must address the six Es in E-CRM to optimize the value of relationship between companies and their customers. They are:

1. Electronic
2. Enterprise
3. Empowerment
4. Economics
5. Evaluation
6. External Information

1. **Electronic:** New electronic channels such as the web and personalized e-messaging have become

the medium for fast, interactive and economic customer communications, challenging companies to keep pace with this increased velocity.

2. **Enterprise:** Through E-CRM, a company gains the means to touch and shape a customer's experience across the entire organization, reaching beyond just the bounds of marketing to sales, services and corner offices whose occupants need to understand and assess customer behavior. It relies heavily on the construction and maintenance of a data warehouse that provides consolidated, detailed views of individual customers, cross channel customer behavior and communications history.

3. **Empowerment:** E-CRM strategies must be structured to accommodate consumers, who now have the power to decide when and how to communicate with the company and through which channel. With the ability to opt in optout; consumers decide which firms earn the privilege. In light of this new consumer empowerment, an E-CRM solution must be structured to deliver timely, pertinent, valuable information that a consumer accepts in exchange for his or her attention.

4. **Economics:** Too many companies execute customer communication strategies with little effort or ability to understand the economics of customer relationships and channel delivery choices. Yet, customer economics drives smart asset allocation decisions, directing dollars and efforts as individuals are likely to provide the greatest return on customer communication initiatives.

5. **Evaluation: U**nderstanding customer economics relies on a company's ability to attribute customer behavior to marketing programs, evaluate customer interactions along various customer touch point channels, and compare anticipated ROI (Rate of Investment) against actual returns through customer analytic reporting. Evaluation of results allows companies to continuously refine and improve efforts to optimize relationships between companies and their customers.

6. **Eternal Information:** The use of consumer sanctioned external information can be employed to further understand customer needs. This information can be gained from such sources as third party information networks and web page profiler applications, under the condition that companies adhere to strict consumer opt in rules and privacy concerns.

## 12.9 Similarities and Differences between CRM and E-CRM

As the customer relationship revolution moves on, companies are willing to find better ways in dealing with customers. CRM and E-CRM offer these opportunities to provide value added relationships. The tables below identify some of the CRM and E-CRM similarities. It is important for a company to review their business model and then choose the direction of traditional CRM or the E-CRM.

***Table- 1 :Similarities between CRM and E-CRM***

| **Characteristics** | **CRM and E-CRM** |
|---|---|
| Objective | They make the companies closer to the customers. |
| Level of Interaction | They provide the best interaction between marketing, sales, service and support |
| Usage | They eliminate and reduce the disconnections between customer and company relationships. |
| Focus | They both improve upon reality and perception of personalization |
| Media | Mail, telephone or in person or the common customer touch points |

***Table – 2 : Difference between CRM and E-CRM***

| Characteristics | CRM | E-CRM |
|---|---|---|
| Strategy | It is a business strategy for acquiring and maintaining the right customer. | It is an extension, which includes the electronic channel also along with the traditional channel of CRM. |
| Customer Touch Points | Customer touch points or contacts are through mail, telephone or in person. | Includes web enabled touch points and fully integrates with the other traditional touch points. |
| Process | This is the manual process where the human beings will handle the customers and the interaction will be direct. | This is the menu-based interaction where the customers will interact through the applications. This communication is indirect. |
| Priority of Goals | This is Company centric mechanism where the company objectives and the growth will have highest priority. | This is customer centric mechanism where the customers and their satisfaction will have highest priority. |
| Emotional Dealings | Emotional dealings will be more because the human beings handle the customers. The human frustrations or the multiple dealings at the same time can affect the customer relationship. | Emotional dealings will be less. Because the machines and the applications cannot express their emotions. The relationship will be stable. |
| Nature of Transaction | Single transaction at a time. Because the human being can interact with only one customer at a time. Due to this reason the company may lose the customers because of the time delay or the frustrations or may create errors in the dealings. | Multiple transactions at the same time. Many customers can log on at the same time and can enter into the dealings with the organization without any confusion. |
| Mode of Communication | Single mode communication | Multi mode communication. All the touch points are accessed and the information will go to the same data repository. |
| Data Repository | Multiple data repository | Single data repository |
| Man Power | Manpower requirement is more and the technical requirement is less. | Manpower requirement is very less and the technical browsers, applications, DBMS requirements will be more. |
| Data Pooling | Customer data is maintained only as a history, which is not utilized as a customer intelligence base. | Customer data is used for review purpose. The data will be analyzed and the further sales pattern will be based on the existing data. The algorithms will analyze the data and the sales models will be prepared automatically. |
| Constraints | The transaction is limited by time, geographical factors | The transaction can happen at any time from anywhere in any way. |
| Emphasis | Emphasis on customer care and customer satisfaction. | Emphasis on integration and better customer integration. |
| Return on Investment | Return on Investment is generally difficult to calculate. | Helps in calculating Return on Investment using customer lifetime value. |
| Number of Campaigns | Less number of campaigns possible. | More number of campaigns possible. |

## 12.10 Components of E-CRM

1. **E-CRM Assessment:** It is very important to devise numerical measures of how a company measures up in the eyes of the customers with respect to its competitors. An E-CRM capability index is devised which provides a benchmark for cross company comparison. Based on these results, a company identifies quick hits, which can be immediately implemented to improve business processes; impact the bottom line and future enhance its understanding of its customer's view of the company.

2. **E-CRM Strategy Alignment:** Each company must identify measures and align to the gaps that exist between customer expectation already measured in the e-CRM assessment stage and the internal capabilities that serve these customer expectations.

3. **E-CRM Architecture:** During this stage, the company will try and develop a CEA (Connected Enterprise Architecture) within the contest of the company's own customer relationship management strategy. The following is a set of technical e-CRM capabilities and applications that collectively and ideally comprise a full e-CRM solution.
   - **Customer Analytic Software:** It should integrate with customer communications software to enable companies to transform customer findings into ROI (Return on Investment) producing initiatives.
   - **Data Mining Software:** The predictive modeling it does must be tightly integrated with campaign management software to keep pace with multiple campaigns running daily or weekly.
   - **Campaign Management Software:** This software tests various offers against control groups, capture promotion history for each customer and prospect and produces output for virtually any online or offline customer touch point channel.
   - **Business Simulation:** It is used in conjunction with Campaign Management Software, optimizes offer, messaging and channel delivery prior to the execution of campaign and compares planned costs and ROI projections with actual result.
   - **Real Time Decision Engine:** It coordinates and synchronizes communications across duplicate customer touch points system. It contains business intelligence to determine and communicate the most appropriate message offer and channel delivery in real time and support two-way dialogue with the customer.

## 12.11 Architecture of CRM

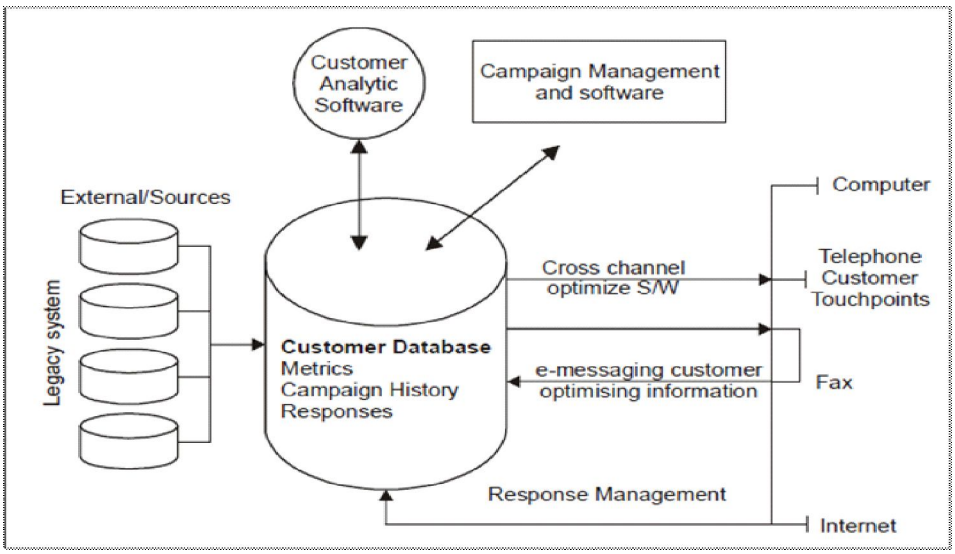


**Figure - 12.6 Architecture Diagram**

**Architecture of PeopleSoft CRM:** Internet architectures are very difficult to realize in practice. Perhaps, the company that is purchasing CRM system has a long history of using SAP or has built its own internal system or has both client server and mainframe systems at multiple sites. This sort of problems can create a disaster unless there is some way of dealing with the problem, the Internet architecture can provide. The strength of PeopleSoft architecture is elegant approach for integration using the concept of available enterprise integration points (EIPs). The idea of EIP is central to all Internet architecture. They are open, standard pieces of reusable code that provide the developers with preprogrammed means to communicate with internal systems and other PeopleSoft systems. In Sap's world, they are called Business Application Programmers Interface [BAPI]. PeopleSoft provides these EIPs through their open integration framework. OIF is a multi-featured framework that provides foundation for various interactions between systems.

**It consists of the following parts:**

1. **Application Messaging:** This is the publish/subscribe model for communication and synchronization between one system and the other. It works with XML messages that the other systems don't have to have knowledge of. When a specified business event occurs, the message is created and sent to any number of users who have subscribed to that message.
2. **Business Interlink:** They are Internet versions of what has been called as enterprise application integration. Through the use of C, C++, or JAVA, these business interlinks are plug-ins that identify the transactions, wrap themselves around third party API and then allow data to pass to or from third party. It saves you from the trouble of trying EAI application if it works well.
3. **Component Interface API:** The components are easily recognizable interfaces in the business world such as a sales order, invoice etc. The interface is the ability of architecture to recognize the document in other party's form and pass PeopleSoft data to that form. It can be done through the same languages and protocols as business interlink and CORBA and EJB.
4. **People Code Java:** These are specific Java classes which provides for programmers who are interested in Java.
5. **File Layout Object and Application Engine:** PeopleSoft uses application engine for large-scale batch processors. The file layout object is a metadata representation of a flat file whose data is in either an XML format or delimited by columns or delimiting characters.
6. **EDI Manager:** This is useful for systems that use EDI rather than XML. When an incoming EDI transaction is recognized, it is translated to a PeopleSoft business document and then processed.
7. **Open Query:** This is a tool and it allows third party applications to communicate with PeopleSoft. This is a classic representation of well functioning Internet architecture. It is mature, ready to work with the third party system and as a whole sophisticated enough for any sized enterprise.
8. **Occupied Real Estate:** The pure Internet application normally rests on the server with browser as zero code clients. The web enabled content applications need downloaded applets and applications to desktop to carry out a specific function.
9. **The feel:** With the browser as the client, it is easy to feel that access anywhere and anytime. Because all the functions are accessible transparently.
10. **Back-end code:** While CRM is considered front office technology meaning that the applications are available to the customer and the impact of the customer, there is a back end to the front office

i.e. to develop E-CRM, development tools for the web that use HTML, JAVA, JAVASCRIPT, EJB, PERL or XML are the groundwork for introducing "e before E-CRM.

## 12.12 Technology Solution for E-CRM

Database technology is at the heart of delivering CRM applications. Often the database is accessible through an intranet web site accessed by employees, or an extranet accessed by customers or partners provides an interface with the entire customer relationship management system. Today, on-demand web services such as Siebel CRM on Demand (www.crmondemand.com) and Salesforce.com (www.salesforce.com) are becoming increasingly popular.

E-mail is used to manage many of the inbound, outbound and internal communications managed by the e-CRM system. Using e-mail for communications is a service provided by e-CRM systems such as Sales force (www.salesforce.com) or Siebel (www.siebel.com), or smaller businesses can use an e-mail marketing ASP service such as Email Reaction (www.emailreaction).

A workflow system is often used for automating CRM processes. For example, a workflow system can remind sales representatives about customer contacts or can be used to manage service delivery such as the many stages of arranging a mortgage.

**The three main types of customer data held as tables in customer databases for CRM are typically:**

1. **Personal And Profile Data:** These include contact details and characteristics for profiling customers such as age and sex (B2C) and business size, industry sector and individual's role in the buying decision (B2B).
2. **Transaction Data:** A record of each purchase transaction including specific product purchased, quantities, category, location, date and time, and channel where purchased.
3. **Communications Data:** A record of which customers have been targeted by campaigns, and their response to them (outbound communications). Also includes a record of inbound enquiries and sales representative visits and reports (B2B).

**The Hewson Consulting Group (www.hewson.co.uk) identifies the following benefits of CRM systems to customers:**

- Improved response times to customer requests for information;
- Delivered product meets customer requirements;
- Reduced costs of buying and using a product or service;
- Immediate access to order status and more responsive technical support.

**Technical issues for managers selecting e-CRM systems are:**

1. Type of applications
2. Integration with back-office systems
3. The choice of single-vendor solutions or a more fragmented choice
4. Data quality.

1. **Types of CRM Applications:** *Figure 12.7* is intended to convey the complexity of providing

CRM solutions. The aim of CRM technology is to provide an interface between the customer and the employee that replaces or facilitates direct interaction. From both customer and employee perspectives, the ultimate aim of CRM systems is to enable contact regardless of the communications channel that the customer wants to use, whether this is traditional methods such as phone or fax or newer digital technologies. Thus the ideal CRM system will support multi-channel communication or the customer-preferred channel. Regardless of channel, the customer will have different needs depending on their stage in the buying process. In the figure, we identify three core needs for the customer – to find out more information about a product, to place an order and to receive post-sales support. Applications must be provided to support each of these needs. Likewise, the employee will have applications requirements to support the customer and the sales and marketing objectives of the organization; in the figure these are sales force automation, to place an order received by phone, by fax or in person and to answer customers' questions via a support system and knowledge base. At the heart of the system is the database storage needed to support these applications.

2. **Integration With Back-Office Systems:** When introducing a CRM system to an organization, a company will have previously invested in systems for other key business functions such as sales order processing or customer support. These existing, legacy systems appear at both the applications and database levels in *Figure 12.7*. It will not be financially viable to discard these applications, but integration with them is vital to give visibility of the customer information to everyone in the organization and provide excellent customer support. Thus integration of legacy systems is a vital part of deciding on and implementing CRM systems.

3. **The choice of single-vendor solutions or a more fragmented Choice**

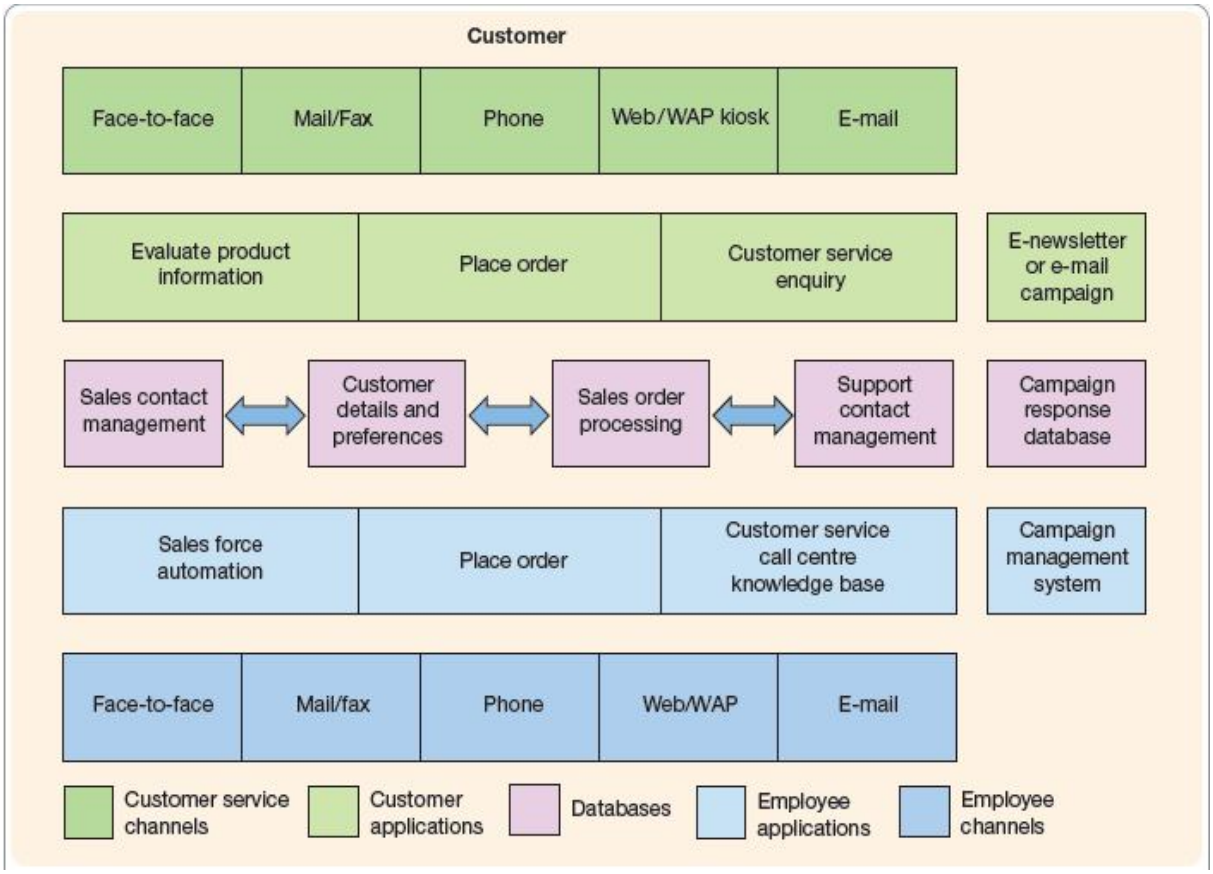


**Figure - 12.7 : An Overview Of Components Of CRM Technologies**

Figure 12.7 - highlights the key issues in deciding on and designing a system to support CRM. Think about the ideal situation; it would be:

- A single customer-facing and employee-facing application that supports all the communications channels;
- A single integrated database such that any employee has total visibility about a customer – they can access all visit, sales and support histories;
- From a single vendor for ease of implementation and support.

4. **Data Quality:** All CRM systems are critically dependent on the currency, completeness and accuracy of their databases. One of the biggest challenges after installation is maintaining data quality. The importance of this was recognized in a survey of CRM and marketing managers in 120 medium–large UK B2C organizations (QAS, 2002). Of these, 86 per cent rated accurate data as 'crucial' to their CRM system. However, the majority rated their data quality as falling short of their objectives. It can be suggested that for data quality to be managed successfully, the following are important:

   **a) Establish a Business Owner:** This issue is too important to be managed solely by technologists and it requires management at customer contact points, which are part of the responsibility of marketing. All staff involved with managing customer data should be made clear about their responsibilities.

   **b) Optimize Quality on Capture:** Validation checks can be built in at data entry to check that fields such as postcode are complete and accurate.

   **c) Continuously Improve Quality:** Customer contact details constantly change. Changes of e-mail address are even more difficult to manage than changes of physical address. As a consequence, all contact points, whether with the web site, contact-centre staff, or sales staff should be used to help maintain data quality.

   **d) Work Towards A Single View of Customer:** Many errors result because different data are stored in different databases. Unifying the data in a single database is the aim for many organizations, but it is arguably more difficult the older and larger the organization is.

   **e) Adopt a Data Quality Policy:** Of the sample in the QAS (2002) survey 40 per cent had no data quality policy, but this is essential to help achieve the four steps above.

## 12.13 Summary

The objective of customer relationship management (CRM) is to increase customer loyalty in order to increase profitability. CRM is aimed at improving all aspects of the level of customer service. CRM tactics can be based around the acquisition–retention–extension model of the ideal relationship between company and customer. In an e-commerce context, acquisition refers to gaining new customers to a company and converting existing customers to online services. To enable an online relationship it is important to profile customers to find out their needs and expectations and obtain an opt-in e-mail agreement to continue the dialogue. Marketing communications techniques to achieve acquisition, retention and extension include traditional online mass-media techniques and specialized online techniques such as search engine registration, link-building, e-mail marketing and banner advertising. Techniques for customer retention include the use of extranets, online communities, online sales promotions and e-mail marketing. Customer extension involves better understanding of the customer through feedback on new product development and encouraging

customers to increase the depth of their relationship by offering complementary products for purchase or increasing purchase frequency. Knowledge of online buyer behavior, and in particular, the differing needs of the customer through the different stages of the buying decision can be used to improve CRM management. Technology solutions for CRM are aimed at providing interaction between employees and customers across multiple communications channels with all customer information stored in a single database to provide complete visibility of the customer by employees. Managers look to minimize the number of solutions partners they work with to achieve these goals. E-CRM provides companies with a means to conduct interactive, personalized and relevant communications with customers across both electronic and traditional channels.

## 12.12 Self Assessment Questions

1. Define Customer Relationship Management
2. What is E-CRM? Explain its features and framework.
3. State the similarities and differences between CRM and E-CRM.
4. Explain the architecture of E-CRM with example
5. What are the six Es in E-CRM? Also explain key features of E-CRM.
6. Explain the components of E-CRM.
7. What is technology solution for E-CRM

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# Unit - 13 : e-Governance

**Structure of Unit:**



## 13.0 Objectives

After completing this unit, you would be able to;

- Describe various concepts of e-Governance;
- Difference between e-Government and e-Governance;
- Objectives of e-Governance;
- Discuss on increasing Government and Citizen interaction;
- Challenges of e-Government
- Know about transparency in the governing process;
- Elaborate on various stages of e-Governance;
- e-Governance Initiatives in India

## 13.1 Introduction

The introduction of e-Governance in India started with an emphasis on computerizing applications for defence services, economic planning, national census, elections tax collections, etc. However, from the early 90s, e-Governance has taken on a broader dimension, using IT for wider sectoral applications with a policy emphasis on reaching out to rural areas and taking in greater inputs from NGOs and the private sector. While the emphasis was initially on automation and computerization, the later forays began to encompass connectivity, networking, setting up systems for processing information and delivering services.

At a micro level, this ranged from IT automation in individual departments, electronic file handling and access to entitlements, public grievance systems, service delivery for high volume routine transactions such as payment of bills and tax dues to meeting poverty alleviation goals through the promotion of entrepreneurial models and provision of market information. Government weighed down by the rising expectations and

demands of a highly aware citizenry suddenly began to believe that there can be a new definition of public Governance characterized by enhanced efficiency, transparency, accountability and a citizen-orientation in the adoption of IT enabled Governance.

## 13.2 What is e-Governance?

e-Governance aka Electronic Governance means "using Information and Communications Technology (ICT) to transform functioning of the Government".

"e-Governance may be understood as the performance of this Governance via the electronic medium in order to facilitate an efficient, speedy and transparent process of disseminating information to the public, and other agencies, and for performing government administration activities".

e-Governance facilitates interaction between government and citizens (G2C), government and business enterprises (G2B), and inter-agency relationships (G2G) thereby making the entire exercise of governance far more friendly, convenient, transparent, inexpensive, smooth and hassle free.

**World Bank Defines e-Governance as under:**

"The use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government".

e – Governance can be exclaimed as the use of a range of modern Information and Communication Technologies such as Internet, Local Area Networks, mobiles etc. by Government to improve the effectiveness, efficiency, service delivery and to promote democracy.

**Governance: An Information Perspective**

- Representative democracy relies on supposition that best way to make a decision is wider participation for all its citizens having access to relevant information.
- Government is by nature an information intensive organization.
- Information is power and information management is political.

**Governance: In IT Framework**

- Expansion of Internet and electronic commerce, is redefining relationships among various stake holders in the process of Governance.
- A new model of governance would be based upon the transactions in virtual space, digital economy and dealing with knowledge oriented societies.
- Electronic Governance is an emerging trend to re-invent the way the Government works.

**e-Governance: Focus**

- Greater attention to improve service delivery mechanism
- Enhancing the efficiency of production
- Emphasis upon the wider access of information

## 13.3 What is e-Government?

e-Governance is generally considered as a wider concept than e-Government, since it can bring about a change in the way how citizens relate to governments and to each other.

e-Government i.e. Electronic Government is the use of Information and Communications Technology (ICT) to enhance delivery of government information and service to citizens, business partners, employees, other agencies, and government entities."

"e-Government is about improving the efficiency and effectiveness of government by using the internet and related technologies".

"Electronic or e-government means providing public access via the Internet about all the services offered by central government departments and their agencies; and enabling the public to conduct and conclude transactions for all those services.

However the term e-government is misleading, as it implies an electronic substitute for the physical government. Electronic substitution of a government is not possible as Government is a unit of people coming together to administer a country.

e-Government can transform citizen service, provide access to information to empower citizens, enable their participation in government and enhance citizen economic and social opportunities, so that they can make better lives, for themselves and for the next generation.

## 13.4 What is Difference between e-Governance and e-Government?

"Government's foremost job is to focus society on achieving the public interest."

"Governance is a way of describing the links between government and its broader environment - political, social and administrative."

E-Governance is a team often confused with-Government. It is therefore, imperative that a proper understanding of both the terms is clear to avoid any confusion.

Key differences between e-government and e-Governance are as under:

| GOVERNMENT | GOVERNANCE |
|---|---|
| superstructure | functionality |
| decisions | processes |
| rules | goals |
| implementation | coordination |
| outputs | outcomes |
| **e-Government** | **e-Governance** |
| electronic service delivery | electronic consultation |
| electronic workflow | electronic controllership |
| electronic voting | electronic engagement |
| electronic productivity | networked societal guidance |

## 13.5 How e-Government Works?

The e-Government improves improve the quality of government, and peoples' participation in it in four important ways.

i. **It Makes Easier for People to Have Their Say in Government :** Consider a situation where a Ministry proposes to make changes in a particular service. It could outline the proposed policy changes on its Internet site and seek comment from people who have something to say about those services, and the proposed new policy. The feedback could then be used to refine that policy.

ii. **People Receive More Integrated Services Because Different Government Organisations Able to Communicate More Effectively With Each Other:** If you are working in any Ministry and travelling to foreign country, you can get your credentials verified online from Ministry of Home Affairs and Ministry of External Affairs and can seek comments and provide your feedback as well.

iii. **People Will Get Better Services from Government Organisations:** Instead of joining a queue to renew a driver's licence, the licence-holder able to do it from his or her home and at any time of the day on any day of the week. This improves flexibility, speed and access to government services, and it has another potential benefit - lowering the cost of providing the service by government.

iv. **People Can Get Up-to-date and Comprehensive Information About Government Laws, Regulations, Policies and Services:** If a person wants to transport an oversize load of materials by truck or trailer from one side of town to the other, he has to get a hold of the appropriate road safety regulations, which are available only in a printed form. Making that kind of information available on the Internet will improve peoples' ability to go about their leisure or work-time activities safely and within the law.

**Activity A:**

1. How will you differentiate e-Governance from e-Government?
2. How has e-Government changed the working of government system?

## 13.6 Objectives of e-Governance

e-Governance can bring forth new concepts of citizenship, both in terms of citizen needs and responsibilities. Its objective is:

i. To build an informed society

ii. To increase Government and Citizen interaction

iii. To encourage citizen participation

iv. To bring transparency in the governing process

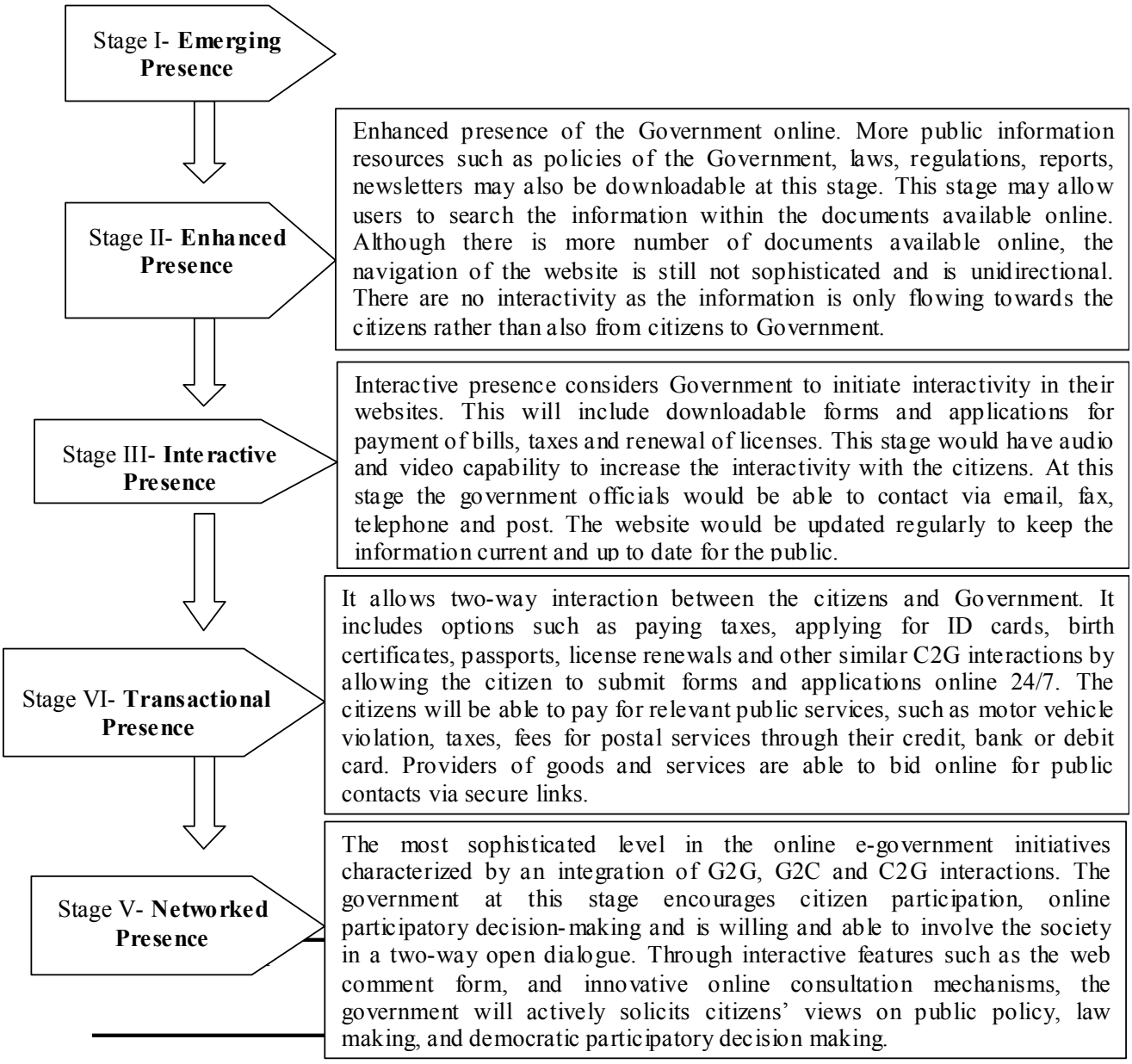
v. To make the Government accountable

vi. To reduce the cost of Governance

vii. To reduce the reaction time of the Government

## 13.7 Stages of e-Governance

Availability of limited and basic information. A basic online involves an official website and few WebPages. Links to ministries and departments of Central /regional/local Government may or may not be available. However most of the information remains static without any options for citizens.




## 13.8 Framework for e-Governance

The e-Governance framework would include Backends (databases of the different government agencies, service providers, state governments etc.), Middleware and the Front-end delivery channels (home PCs, mobile phones, kiosks, integrated citizen service centers etc) for citizens and businesses. The Middleware comprises of communication and security infrastructure, gateways and integrated services facilitating integration of inter-departmental services.

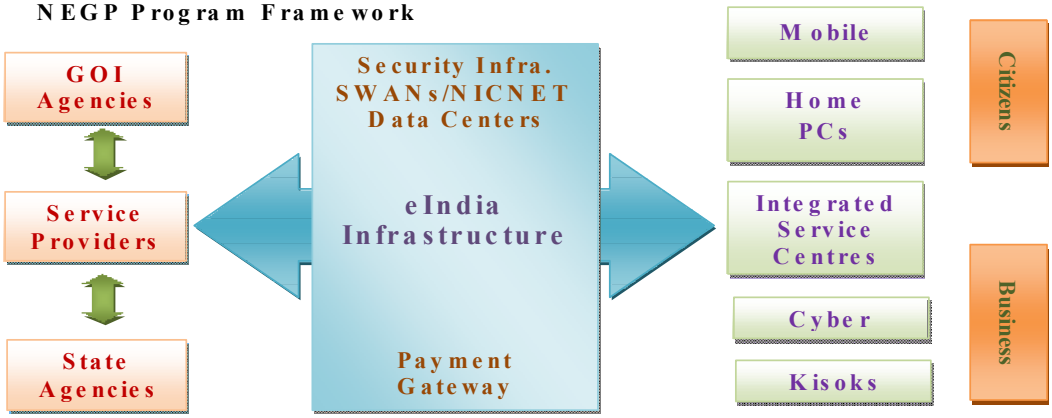



**Figure - 13.1**

### 13.8.1 Major Components of e-Governance Framework

i. Information

ii. Interaction

iii. Transaction

iv. Transformation

#### 13.8.1.1 Information

It is imperative for governments to inform their citizens about the services and opportunities that they offer in a transparent and equitable manner. It is only then that the facilities provided would be utilized properly and the nation move forwards.

- Web presence
- Public Information (G2C & G2B)

Examples of Information

- Governmental rulings
- Policies and decisions in state
- Coming Events
- Public Transportation Schedules
- Job Opportunities/Advertisements
- Self help or Counseling
- Emergency Medical & Accident Advise

#### 13.8.1.2 Interaction

Information enables communication is between these stakeholders and leads to healthy interaction between them. This ushers in accountability and transparency in the functioning of different government agencies in their dealings with citizens. They start to voice their opinion and concerns about the way the government functioning and contribute towards fulfilling the objective of good governance. This stage implies:

- Interaction between government and public (G2C & G2B)
- E-mail
- Search engines
- Downloadable forms and documents

Example of interaction

- Admissions related registration
- Circulars
- Grievance Online Applications
- Bio-data Online/Job Application forms Online
- Placement Registration/Send Bio-data
- Others

#### 13.8.1.3 Transaction

Once citizens get a platform where they can voice their views, they get involved in planning, development as well as in monitoring the activities of different government agencies. In other words it can be said that

citizens get a complete access to all the activities of the government and they can get completely involved in the process of governance. Then transaction follows:

- Complete transactions (G2G, G2IB, G2PP, G2NG, G2C & G2B) can be done without going to an office
- Digital (electronic) signatures necessary to enable legal transfer of services.

Examples of Transaction

- Online Interviews & Recruitment
- Career Counseling/Guidance
- Online Learning
- Online Training

#### 13.8.1.4 Transformation

Once the above mentioned practice comes into existence, it leads to a situation where citizens, through a process of debates, consensus and compromise, find expression for their concerns in the overall governance of their country. This brings about a revolutionary transformation in the way a government functions and contribute towards achieving the objective of 'good governance'.

- All information systems are integrated and the public can get G2C & G2B services at one (virtual) counter.
- One single point of contact for all services is the ultimate goal.

Examples of Transformation

- Online University
- Competitive Examinations (JEE, UPSC, SPSC, Others)
- Smart Schools/Colleges/Universities
- Personalized Education
- Complete Personality

**Activity B:**

1. What are the objectives of e-governance?
2. How do different stages of e-Governance differ from each other?
3. What are the major differences between Interaction and Transformation components of e-Governance Framework

## 13.9 Benefits of e-Governance

**E-Governance ushers in multiple advantages:**

- It greatly simplifies the process of information accumulation for citizens and businesses.
- It empowers people to gather information regarding any department of government and get involved in the process of decision making.
- e-Governance strengthens the very fabric of democracy by ensuring greater citizen participation at all levels of governance

- E-Governance leads to automation of services, ensuring that information regarding every work of public welfare is easily available to all citizens, eliminating corruption.
- This revolutionizes the way governments function, ensuring much more transparency in the functioning, thereby eliminating corruption.
- Since the information regarding every activity of government is easily available, it would make every government department responsible as they know that every action of theirs is closely monitored.
- Proper implementation of e-Governance practices make it possible for people to get their work done online thereby sparing themselves of unnecessary hassles of traveling to the respective offices.
- Successful implementation of e-Governance practices offer better delivery of services to citizens, improved interactions with business and industry, citizen empowerment through access to information, better management, greater convenience, revenue growth, cost reductions etc.
- Furthermore, introduction of e-Governance brings governments closer to citizens. So much so that today it becomes extremely convenient to get in touch with a government agency. Indeed, citizen service centers are located closer to the citizens now. Such centers may consist of an unattended kiosk in the government agency, a service kiosk located close to the client, or the use of a personal computer in the home or office.
- e-Governance practices help business access information that might be important for them at a click.

## 13.10 e-Governance Challenges

*"e-governance, however, is not really the use of IT in governance but as a tool to ensure good governance. e-governance does not mean proliferation of computers and accessories; it is basically a political decision which calls for discipline, attitudinal change in officers and employees, and massive government process re-engineering,.*

The diffusion of e-Government has been slower than expected and the governments are not making full use of the available technology for reforming governance. Wherever adopted, the impact of e-Government has been only incremental rather than transformative.

A number of challenges have limited the reach and impact of e-Government. Several social, economic and political barriers constrain the scope of transformation and restrict the ability of policy makers to make effective use of new technology. The two most commonly cited constraints are digital divide and the political nature of public sector reforms.

Universal access to the internet is still far away in many countries. In some countries significant proportion of population cannot afford to access the technology even when it is available. The UN e-government survey-2008 notes that as a proportion of monthly income, internet access in the United States is 250 times cheaper than in Nepal and 50 times cheaper than in Sri Lanka. In the United States, 50 per cent of the people use the internet compared to a global average of 6.7 per cent. In Indian sub-continent, it is a mere 0.4 percent. Studies have shown that even in developed countries online transactional systems have achieved modest and, in many cases, extremely low usage levels. Governance reforms literature shows that bringing openness to public sector agencies and improving bureaucratic accountability often meet with stiff resistance as they require substantial changes in the existing power relations. These political dynamics partly explain why e-government projects which have governance reforms as their principal target do not impact the

system beyond achieving politically neutral goals such as improved access and increased efficiency. E-governance will continue to advance but its pace, spread and impact will be determined by the extent of technology diffusion and the pressure of public demand for reforms.

The biggest challenge of deploying e-governance is not technology but change management. Change management is important not only in terms of cultural change but also in terms of changing operations and processes workflow that the automated environment will introduce.

The key challenges with electronic governance are not technology or internet issues but organizational issues like

- Redefining rules and procedures
- Information transparency
- Legal issues
- Infrastructure, Skill and awareness
- Access to right information
- Interdepartmental collaboration
- Tendency to resist the change in work culture

### 13.10.1 e-Governance obstacles

Major obstacles are:

- geographical distances
- lack of trained human resources
- lack of ICT penetration in remote areas.

For instance, a good e-governance application will not benefit anybody in remote areas if there is no supporting infrastructure such as electricity, computers and connectivity.

The connectivity obstacle have also reduced over the years with the falling prices of bandwidth and increased reach of connectivity service providers. Major VSAT service providers already have established large footprints in India, and telecom service providers have stepped up their leased line offerings even in previously unrepresented territories.

Many state governments have developed state wide area networks (SWANs), customised applications, and data banks. But the interconnectivity of the servers is an issue which calls for the establishment of state data centres. The NIC, which is promoting e-governance in the country, has established VSAT connectivity in all the districts of the country. There remains however issues such as standardisation, inter-operability, security, and propriety vs. open source.

### 13.10.2 e-Governance Challenges Specific to India

We list down some of the challenges which are specific to India –

- **Lack of Integrated Services:** Most of the e-Governance Services being offered by state or central governments are not integrated. This can mainly be attributed to ***Lack of Communication between different Departments.*** So the information that resides with one department has no or very little meaning to some other department.
- **Lack of Key Persons:** e-Governance projects lack key persons, not only from technological aspect, but from other aspects as well.

- **Population:** This is probably the biggest challenge. Apart from being an asset to the country it offers some unique issues, an important one being **Establishing Person Identities.** There is no unique identity of a person in India. Apart from this, measuring the population, keeping the database of all Indian nationals (& keeping it updated) are some other related challenges.
- **Different Languages:** A challenge due to the diversity of the country. It enforces need to do governance (upto certain level), in local languages. Ensuring e-Governance in local language is a big task to achieve.

### 13.10.3 Success factors of e-Gov projects -

- 10% Technology
- 60% Process
- 20% Change Management
- Rest is luck

### 13.10.4 Challenges for e-Government in India:

The governments both –the Union and the states must make earnest efforts to complete the daunting, but formidable task of quicker and effective e-government programs by:

- Huge investments for the purchase of hardware and software for computerization;
- Mobilize resources for this arduous job. One way to deal with the situation could be for leasing of computers. This would reduce initial heavy capital investments.
- Establishing complete connectivity between various ministries and departments so that transfer of files and papers could be done through Internet giving efficacious speed as an alternative to manual labour.
- The interoperability of e- governance projects for benefit of IT in day to day life requires databases of various departments compatible with one another.
- Supplying information to the public in a language that they understand and are comfortable with, and generally, it is the local language. With, technology transliteration from English into other languages can be made.
- Changing the mindset of the government employees who are used to working only in the manual mode. This is a big task and needs patience and careful planning.

**Activity C:**

1. How wil you differentiate major benefits and challenges of e-Governance?

## 13.11 e-Governance in India

**e-Governance in India** has steadily evolved from computerization of Government Departments to initiatives that encapsulate the finer points of Governance, such as citizen centricity, service orientation and transparency. Due cognizance has been taken of the notion that to speed up e-Governance implementation across the various arms of Government at National, State, and Local levels, a programme approach needs to be adopted, guided by common vision and strategy.

The main thrust for e-Governance was provided by the launching of NICNET in 1987 – the national satellite-based computer network. This was followed by the launch of the District Information System of the

National Informatics Centre (DISNIC) programme to computerize all district offices in the country for which free hardware and software was offered to the State Governments. NICNET was extended via the State capitals to all district headquarters by 1990. In the ensuing years, with ongoing computerization, tele-connectivity and internet connectivity established a large number of e-Governance initiatives, both at the Union and State levels.

The Government of India kick started the use of IT in the government in the right earnest by launching number of initiatives. First the Government approved the National E-Governance

Action plan for implementation during the year 2003-2007. The plan is an attempt to lay the foundation and provide impetus for long-term growth of e-governance within the country. It proposed to create the right governance and institutional mechanisms at the center, state and local levels to provide a citizen centric and business centric environment for governance. The Government has given approval in-principle to the plan and overall programme content; implementation approach and governance structure. While endorsing the plan, it was observed that: weight age must be given for quality and speed of implementation in procurement procedures for IT services; suitable system of motivating the states for quick adoption be incorporated; provision of delivery of services to the citizens through a single window should be encouraged; Out sourcing of services wherever and whenever feasible; efforts be made to promote and develop public private partnerships to utilize the full potential of private sector investments; and connectivity should be improved and extended up to the block level in the states. Apart from the action plan, the following measures have also been introduced:

- **Adoption of "Information Technology (IT) Act, 2000** by the Government of India to provide legal framework to facilitate electronic transactions. The major aims of this act are to: recognize electronic contracts, prevents computer crimes, and make electronic filing possible. The Act came into force on 17 October, 2000;
- **Establishment of the National Taskforce of Information Technology and Software Development in May 1998**;
- **Creation of Centre for e-Governance** to disseminate the best practices in the area of e-Governance for the use by the Central and State Governments and act as a nodal center to provide general information on e-governance, national and international initiatives, and IT policies of the government(s);
- **Developing e-office Solutions** to enable various ministries and departments to do their work electronically. Modules such as Workflow for Drafts for Approvals, e-file, e56 notings, submission of reports, integrated personal information and financial accounting systems have been developed;
- **Instituting Websites** by almost all Ministries and Departments and providing information on aspects such as their objectives, policies and decisions, contact persons, etc. Some of them have started their electronic newsletter for giving publicity to their activities on wider scale; and identifying departments, which have frequent inter-face with the citizens, and computerizing them on priority basis.

Some Departments of Government of India as well as State Governments had initiated steps to adopt e-Governance under the following categories:

i. Government to Citizen (G2C) initiatives
ii. Government to Business (G2B) initiatives
iii. Government to Government (G2G) initiatives

### 13.10.1 Central Initiatives

The formulation of National e-Governance Plan (NeGP) by the Department of Electronics and Information Technology (DEITY) and Department of Administrative Reforms and Public Grievances (DAR&PG) in 2006 has boosted the e-Governance process.

**The Aadhar Project in 2010 ,** a big part of the national e-governance plan in India, earlier known as Unique Identification Number or UID aims to make our welfare systems more accessible and fair to every citizens of India**.**

The Central initiatives include:

- National e-Governance Plan (NeGP)
- National e-Governance Division (NeGD)
- e-Governance Infrastructure
- Mission Mode Projects
- Citizens & Business Services
- Projects and Initiatives
- R&D in e-Governance

### 13.10.2 States Initiatives

Several State Governments have taken various innovative steps to promote e-Governance and have drawn up a roadmap for IT implementation and delivery of services to the citizens online. The applications that have been implemented are targeted towards providing Government to Citizen (G2C), Government to Business (G2B) and Government to Government (G2G) services with emphasis on use of local language.

State governments have initiated measures to introduce information technology and its tools in the governance process. Most of these states are using these applications for improving service delivery to their citizens. They are moving from manual processes to on-line delivery by using conveniently located service centers in public places.

Counters at these service centers are manned by public/ private agencies and multiple services are provided on-line at each location. Empirical evidence reveals that it has not been

an easy task to implement ICT related reforms particularly at the state level and hence needs to be planned carefully for their successful implementation.

Every State has the flexibility of identifying up to five additional State-specific Mission Mode Projects (relevant for economic development within the State). In cases where Central Assistance is required, such inclusions are considered on the advice of the concerned Line Ministries/ Departments. States have MMPs on Agriculture, Commercial Taxes, e"District, Employment Exchange, Land Records, Municipalities, Gram Panchayats, Police, Road Transport, Treasuries, etc. Apart from MMPs the States have other e-Governance initiatives.

## 13.11 e-Governance Projects in India

| Some e-Governance Initiatives | |
|---|---|
| **State/Union Territory** | Initiatives covering departmental automation, user charge collection, delivery of policy/programme information and delivery of entitlements |
| **Andhra Pradesh** | e-Seva, CARD, VOICE, MPHS, FAST, e-Cops, AP online-One-stop-shop on the Internet, Saukaryam, Online Transaction processing |
| **Bihar** | Sales Tax Administration Management Information |
| **Chattisgarh** | Chhattisgarh Infotech Promotion Society, Treasury office, e-linking project |
| **Delhi** | Automatic Vehicle Tracking System, Computerisation of website of RCS office, Electronic Clearance System, Management Information System for Education etc |
| **Goa** | Dharani Project |
| **Gujarat** | Mahiti Shakti, request for Government documents online, Form book online, G R book online, census online, tender notice. |
| **Haryana** | Nai Disha |
| **Himachal Pradesh** | Lok Mitra |
| **Karnataka** | Bhoomi, Khajane, Kaveri |
| **Kerala** | e-Srinkhala, RDNet, Fast, Reliable, Instant, Efficient Network for the Disbursement of Services (FRIENDS) |
| **Madhya Pradesh** | Gyandoot, Gram Sampark, Smart Card in Transport Department, Computerization MP State Agricultural Marketing Board (Mandi Board) etc |
| **Maharashtra** | SETU, Online Complaint Management System-Mumbai |
| **Rajasthan** | Jan Mitra, RajSWIFT, Lokmitra, RajNIDHI |
| **Tamil Nadu** | Rasi Maiyams–Kanchipuram; Application forms related to public utility, tender notices and display |
| **North-Eastern States** | |
| **Arunachal Pradesh,** | Community Information Center. Forms available on |
| **Manipur, Meghalaya,** | the Meghalaya website under schemes related to |
| **Mizoram & Nagaland** | social welfare, food civil supplies and consumer affairs, housing transport etc. |

## 13.12 Success Story of e-Governance Projects in India

### 13.12.1 Digitization of Land Records: Bhoomi Project

Bhoomi project is an attempt made by Karnataka State Government for Computerization of Land Records. This project is sponsored jointly by Ministry of Rural Development, Government of India and State Government of Karnataka.

Under the Bhoomi E-Governance project all 20 million land records of 6.7 million land owners in 176 taluks of Karnataka have been computerised. This system works with the software called "BHOOMI" designed fully in-house by National Informatics Center, Bangalore.

#### 13.12.1.1 Important Features of BHOOMI

- This software provides for printing of land records as and when required.
- It incorporates process of online updation to ensure that the RTCs provided to the farmers is in sync with the time.
- All the mutations to the land records database are done on the computer itself so as to ensure that data on computer remain current with time.
- It incorporates the state of the art bio-logon metrics system from Compaq, which authenticates various users on the Bhoomi software on the basis of fingerprints.This ensures that no body can hack the system by imitating other users.
- This software also has the provision of scanning of original mutation orders of the revenue inspector (who is the authorised person to pass orders in the mutations in the field) and notices served on interested parties. Both documents are scanned to ensure that not only responsibility can be fixed on Officials by showing the original documents signed by them but also to ensure that the intestered particies do not claim in the court that they were not served with the notice before effecting the mutation.
- The software enables the administrators to generate various reports based on type of soil, land holding size, type of crops grown etc. This information would enable administrators to take informed policy decision.

#### 13.12.1.2 Components of Bhoomi

There are 3 main components in Bhoomi system -

- The computer centre where mutation and updation are done in online fashion. It includes finger print authentication and scanning of important documents to ensure robust and secured system. Most of the components of the Computer Centre are funded under the Central Scheme.
- Land Records kiosk from where the farmers can collect the copy of their record by paying Rs.15. They can also lodge request for mutation to their land records . the Kiosk is fully funded by State Government.
- Touch Screen Kiosk where farmers can see their land related information without anybody's intervention or help.

### 13.12.1.3 Benifits of Bhoomi

#### A. FARMERS

**a. Farmers can quickly get their land records from Kiosks and are protected from harassment and extortion**

As against time delay of 3 to 30 days they now get their records in less than 2 minutes. No overhead cost is to be incurred. No application is required to be submitted at the kiosk. The records are authentic and legible. Use of biometrics authentication system for updation of records have freed farmers from the worry of probable manipulation of their records by some times some unscrupulous officials

**b. Reduction in processing time formulation**

Farmers can lodge application for mutation (change in land title) to their land records at the mutation kiosks, get acknowledgement for the same and can monitor the progress using touch screen kiosks available in some Bhoomi centers. They would then get their updated land record in a fixed time frame without the need of approaching any authority. As against earlier time of 70-200 days, mutation would now require less than 35 days.

**c. Online tracking of mutation status**

Farmers can also get the official status report of their request for mutation which would let them know the stage at which their request is pending. This status report would help them in enforcing their right of getting the record mutated in the prescribed time.

**d. Easy access to F**

Online connectivity to banks would ensure farm credit to farmers in less than 5 days as against 25-30 days in manual system.

**e. Ease in case of legal matters**

It would be easier for the farmers to pursue land related litigation in the court.

## B. ADMINISTRATORS

### a. Ease of maintenance and updation of land records documents

In manual system land records updation used to get delayed by as high as 1-2 years in some cases. Now it would always be in sync with time

### b. Quick and easy access to Land records for analysis purpose

Support for development programs, based on valuable land records data like various crops grown in a village or a sub district, the fertilizers and pesticide requirement in a season etc to Departments like Agriculture, Industries and Planning. Such data in earlier system became available to departments only after 2-3 years. It is now available almost immediately.

### c. Ease of monitoring Government Lands

Monitoring of Government lands and prevention of their encroachments. Lack of monitoring had costed a reported loss of Rs.25 billion to State Government by way of officials tampering with records. It is now available almost immediately

### d. For Financial Institutions, Online Farm credit related activities

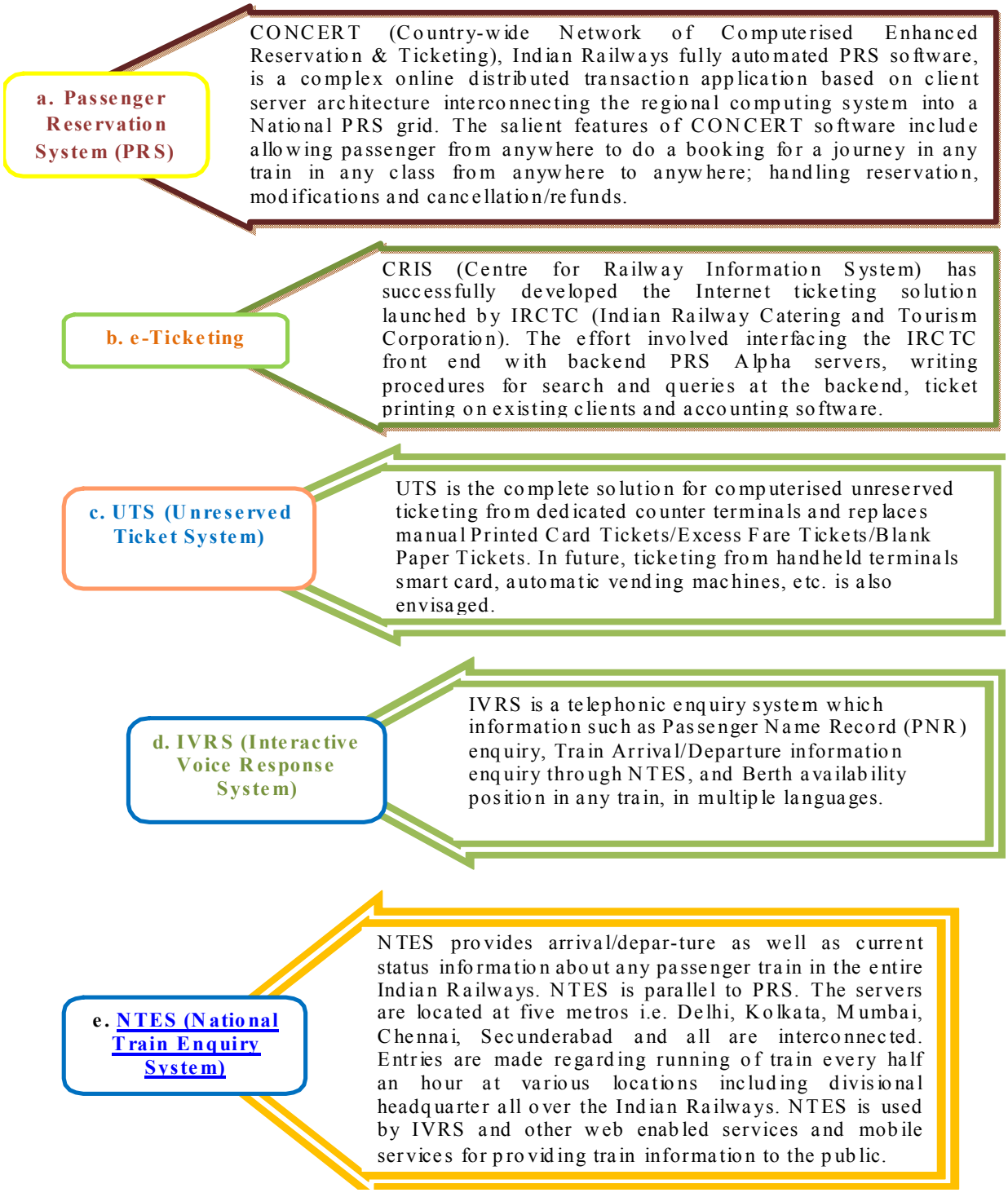
Online connectivity to financial institutions would help banks in planning for their farm credit related activities. In manual system they worked on 2 years old data or just guessed the farm sector requirement

### 13.12.2 Indian Railways RAILNET

The Indian Railways is Asia's largest and the world's second largest rail network. Adopting e-Governance in right earnest and to reap the benefit of IT explosion, Indian Railways have established a 'Corporate Wide Information System' (CWIS) called RAILNET. It provides smooth flow of information on demand for administrative purposes, which would enable taking quicker and better decisions.

Realising the important role that information plays in customer services and in railways operations, IR had embarked on its computerisation program. IR developed a dedicated skeletal communication network, as a basic requirement for train operation. After the early introduction of basic computer applications e.g. Pay rolls, Inventory Control and Operating Statistics, Railways went for deployment of computers for productivity improvement through building up operational databases.

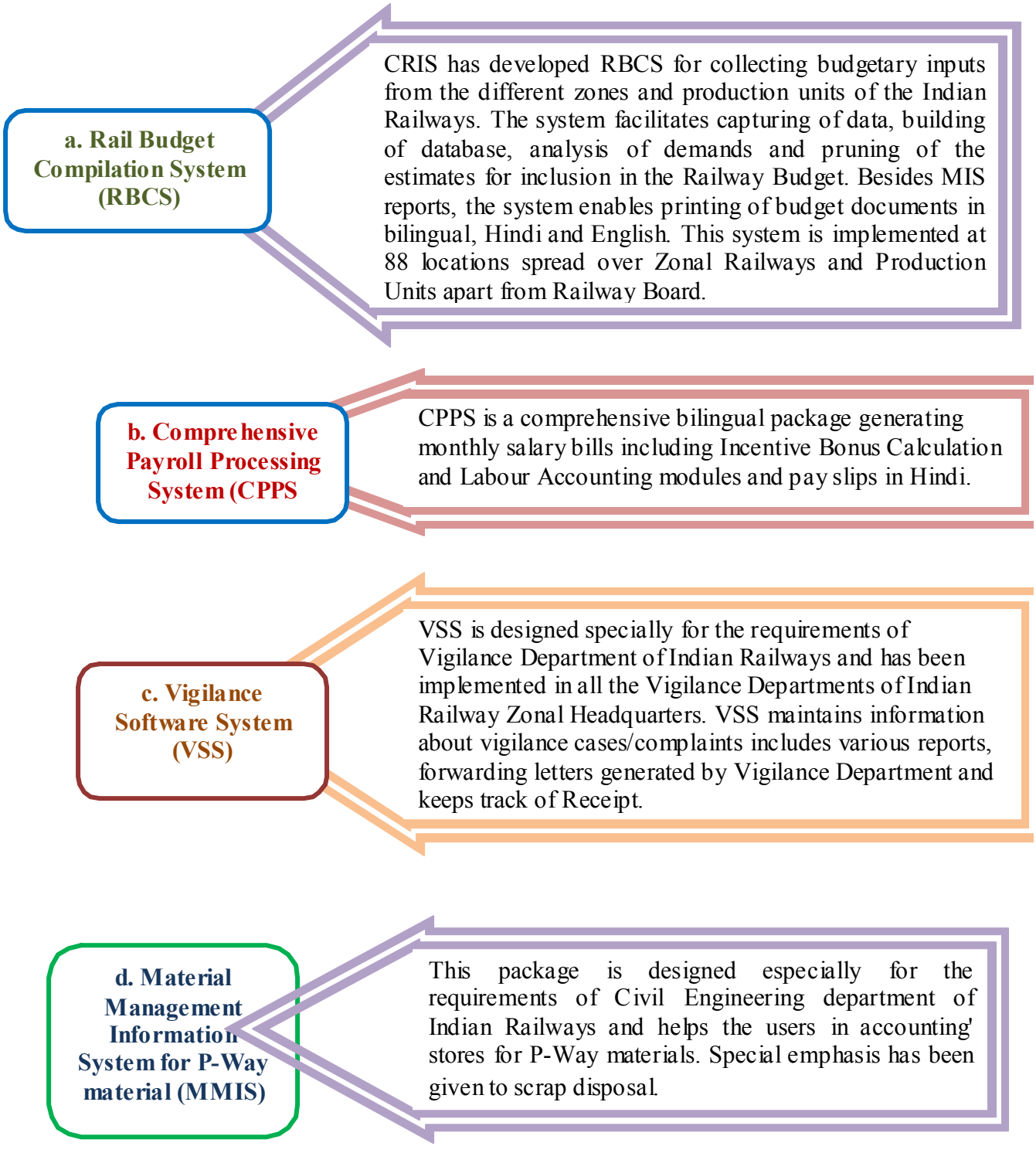
#### 1.12.2.1 Use of IT in Railway



### 13.12.2.2 RailNET MIS

For running any business organisation, the efficiency of the MIS is very important. Indian Railways have many areas, where use of IT is going to have a telling effect. Some of these are listed down:

CRIS has developed RBCS for collecting budgetary inputs from the different zones and production units of the Indian Railways. The system facilitates capturing of data, building of database, analysis of demands and pruning of the estimates for inclusion in the Railway Budget. Besides MIS reports, the system enables printing of budget documents in bilingual, Hindi and English. This system is implemented at 88 locations spread over Zonal Railways and Production Units apart from Railway Board.



## 13.13 Summary

e-Governance projects aiming to improved availability of government services and transparency with participation of citizens. Most significant benefit of all e-Governance projects is time bound service delivery without any mediator. The purpose of implementing e-Governance is to enhance good Governance. Good Governance is generally characterized by participation, transparency and accountability. The recent advances in communication technologies and the Internet provide opportunities to transform the relationship between governments and citizens in a new way, thus contributing to the achievement of good Governance goals. The use of information technology can increase the broad involvement of citizens in the process of Governance at all levels by providing the possibility of on-line discussion groups and by enhancing the rapid development and effectiveness of pressure groups. Advantages for the government involve that the government may provide better service in terms of time, making Governance more efficient and more effective. In addition, the transaction costs can be lowered and government services become more accessible.

## 13.14 Self Assessment Questions

1 How e - Governance has made government more responsive and accessible?

2 Explain the needs and benefits of e - Governance

3 Discuss Transformation and Interaction stages in e – Governance

4 What are the important features of the Bhoomi project of Karnataka and how it is beneficial to farmers?

## 13.15 Reference Books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# Unit - 14 : Legal Aspects in e-Commerce

**Structure of Unit:**



## 14.0 Objectives

After completing this unit, you would be able to:

- Understand the legal issues of E- Commerce.
- Understand the dimensions of IT security.
- Point out the relevance of data communication.
- Know that how digital signature works.
- Learn about use of electronic records.
- Understand different terminology of E-commerce.

## 14.1 Introduction

E-commerce, in the general sense, can be defined as: the use of the Internet and the Web to conduct business transactions. E-commerce is business in the online environment. Here all transactions, deals take place over the internet. E-commerce is business in the online environment. Here all transactions, deals take place over the internet. A more technical definition would be: e-commerce involves digitally enabled commercial transactions between and among organizations and individuals. E-commerce differs from e-business in that no commercial transaction takes place in e-business.

## 14.2 What is e-Commerce?

In a broad sense, electronic commerce is an electronic information exchange between a business and its customers. This can be done by fax, phone, voice-mail1, and e-mail, Extranet or Internet. In the narrow sense of electronic commerce is a complex solution that provides Internet technology. This means that a multitude of applications and Internet service providers must work together in perfect synchronization as an ecommerce site can operate. In other words E-commerce is business in the online environment. Here all transactions, deals take place over the internet. E-commerce is business in the online environment. Here all transactions, deals take place over the internet. A more technical definition would be: e-commerce involves digitally enabled commercial transactions between and among organizations and individuals. It can be depicted as under:-

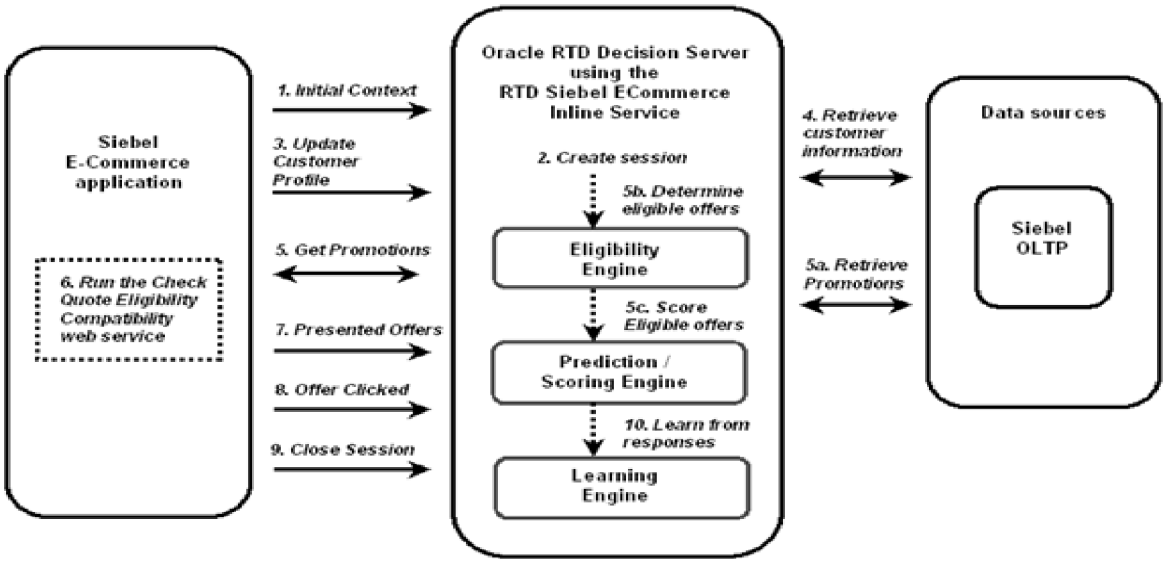


**Figure - 14.1**

## 13.3 IT Act 2000-Law Related to IT Security

Information technology is one of the important law relating to Indian cyber laws. It had passed in Indian parliament in 2000. This act is helpful to promote business with the help of internet. It also set of rules and regulations which apply on any electronic business transaction. Due to increasing crime in cyber space, Govt. of India understood the problems of internet user and for safeguarding the interest of internet users, this act was made.

### 1.3.1 Definitions

(1) In IT Act2000, unless the context otherwise requires, —

*(a)* "access" with its grammatical variations and cognate expressions means gaining entry into, instructing or communicating with the logical, arithmetical, or memory function

resources of a computer, computer system or computer network;

*(b)* "Addressee" means a person who is intended by the originator to receive the

electronic record but does not include any intermediary;

(c) "Adjudicating officer" means an adjudicating officer appointed under subsection (1)

of section 46;

*(d)* "Affixing digital signature" with its grammatical variations and cognate expressions

means adoption of any methodology or procedure by a person for the purpose of authenticating an electronic record by means of digital signature;

*(e)* "Appropriate Government" means as respects any matter,—

(I) Enumerated in List II of the Seventh Schedule to the Constitution;

(ii) Relating to any State law enacted under List III of the Seventh Schedule to the Constitution, the State Government and in any other case, the Central Government;

*(f)* "asymmetric crypto system" means a system of a secure key pair consisting of a

private key for creating a digital signature and a public key to verify the digital signature;

*(g)* "Certifying Authority" means a person who has been granted a license to issue a Digital Signature Certificate under section 24;

*(h)* "Certification practice statement" means a statement issued by a Certifying Authority to specify the practices that the Certifying Authority employs in issuing Digital Signature Certificates;

*(I)* "computer" means any electronic magnetic, optical or other high-speed data processing device or system which performs logical, arithmetic, and memory functions by manipulations of electronic, magnetic or optical impulses, and includes all input, output, processing, storage, computer software, or communication facilities which are connected or related to the computer in a computer system or computer network;

*(j)* "Computer network" means the interconnection of one or more computers through—

(i) the use of satellite, microwave, terrestrial line or other communication media; and

(ii) terminals or a complex consisting of two or more interconnected computers whether or not the interconnection is continuously maintained;

*(k)* "Computer resource" means computer, computer system, computer network, data, computer data base or software;

*(l)* "computer system" means a device or collection of devices, including input and output support devices and excluding calculators which are not programmable and capable of being used in conjunction with external files, which contain computer programmes, electronic instructions, input data and output data, that performs logic, arithmetic, data storage and retrieval, communication control and other functions; *(m)* "Controller" means the Controller of Certifying Authorities appointed under sub-section (l) of section 14;

*(n)* "Cyber Appellate Tribunal" means the Cyber Regulations Appellate Tribunal established under sub-section (1) of section 48;

*(o)* "data" means a representation of information, knowledge, facts, concepts or instructions which are being prepared or have been prepared in a formalized manner, and is intended to be processed, is being processed or has been processed in a computer system or computer network, and may be in any form (including computer printouts magnetic or optical storage media, punched cards, punched tapes) or stored internally in the memory of the computer;

*(p)* "Digital signature" means authentication of any electronic record by a subscriber by means of an electronic method or procedure in accordance with the provisions of section 3;

*(q)* "Digital Signature Certificate" means a Digital Signature Certificate issued under sub section *(4)* of section 35;

*(r)* "electronic form" with reference to information means any information generated, sent, received or stored in media, magnetic, optical, computer memory, micro film, computer generated micro fiche or similar device;

*(s)* "Electronic Gazette" means the Official Gazette published in the electronic form;

*(t)* "electronic record" means data, record or data generated, image or sound stored, received or sent in an electronic form or micro film or computer generated micro fiche;

*(u)* "Function", in relation to a computer, includes logic, control arithmetical process, deletion, storage and retrieval and communication or telecommunication from or within a computer;

*(v)* "Information" includes data, text, images, sound, voice, codes, computer programmes, software and databases or micro film or computer generated micro fiche:

*(w)* "Intermediary" with respect to any particular electronic message means any person who on behalf of another person receives stores or transmits that message or provides any service with respect to that message;

(x) "key pair", in an asymmetric crypto system, means a private key and its mathematically related public key, which are so related that the public key can verify a digital signature created by the private key;

*(y)* "Law" includes any Act of Parliament or of a State Legislature, Ordinances promulgated by the President or a Governor, as the case may be. Regulations made by

the President under article 240, Bills enacted as President's Act under sub-clause (a) of clause (1) of article 357 of the Constitution and includes rules, regulations, bye-laws

and orders issued or made there under;

*(z)* "Licence" means a licence granted to a Certifying Authority under section 24;

*(za)* "originator" means a person who sends, generates, stores or transmits any electronic message or causes any electronic message to be sent, generated, stored or transmitted to any other person but does not include an intermediary;

### 1.3.2 Regulation of Certifying Authorities

**Appointment of Controller and Other Officers:**

(1) The Central Government may, by notification in the Official Gazette, appoint a Controller of Certifying Authorities for the purposes of this Act and may also by the same Or subsequent notification appoints such number of Deputy Controllers and Assistant Controllers as it deems fit.

(2) The Controller shall discharge his functions under this Act subject to the general control and directions of the Central Government.

(3) The Deputy Controllers and Assistant Controllers shall perform the functions assigned to them by the Controller under the general superintendence and control of the Controller.

(4) The qualifications, experience and terms and conditions of service of Controller, Deputy Controllers and Assistant Controllers shall be such as may be prescribed by the Central Government.

(5) The Head Office and Branch Office of the office of the Controller shall be at such places as the Central Government may specify, and these may be established at such Places as the Central Government may think fit.

(6) There shall be a seal of the Office of the Controller.

**Functions of Controller:**

The Controller may perform all or any of the following functions, namely:—

(a) Exercising supervision over the activities of the Certifying Authorities;

(b) Certifying public keys of the Certifying Authorities;

(c) Laying down the standards to be maintained by the Certifying Authorities;

(d) Specifying the qualifications and experience which employees of the Certifying Authorities should possess;

(e) Specifying the conditions subject to which the Certifying Authorities shall conduct their business;

(f) Specifying the contents of written, printed or visual materials and advertisements that may be distributed or used in respect of a Digital Signature Certificate and the public key;

(g) Specifying the form and content of a Digital Signature Certificate and the key,

(h) Specifying the form and manner in which accounts shall be maintained by the Certifying Authorities;

(I) specifying the terms and conditions subject to which auditors may be appointed and the remuneration to be paid to them;

(j) Facilitating the establishment of any electronic system by a Certifying Authority either solely or jointly with other Certifying Authorities and regulation of such systems;

(k) Specifying the manner in which the Certifying Authorities shall conduct their dealings with the subscribers;

(l) Resolving any conflict of interests between the Certifying Authorities and the subscribers;

(m) Laying down the duties of the Certifying Authorities;

(n) Maintaining a data base containing the disclosure record of every Certifying Authority containing such particulars as may be specified by regulations, which shall be accessible to public.

**1.3.3 Licence to Issue Digital Signature Certificates:**

(1) Subject to the provisions of sub-section (2), any person may make an application, to the Controller, for a licence to issue Digital Signature Certificates.

(2) No licence shall be issued under sub-section (1), unless the applicant fulfills such requirements with respect to qualification, expertise, manpower, financial resources and other infrastructure facilities, which are necessary to issue Digital Signature Certificates as may be prescribed by the Central Government

(3) A licence granted under this section shall—

(a) Be valid for such period as may be prescribed by the Central Government;
(b) Not be transferable or heritable;
(c) Be subject to such terms and conditions as may be specified by the regulations.

**Application for Licence:**

(1) Every application for issue of a licence shall be in such form as may be prescribed by the Central Government.

(2) Every application for issue of a licence shall be accompanied by—

(a) A certification practice statement;

(b) A statement including the procedures with respect to identification of the applicant;

(c) Payment of such fees, not exceeding twenty-five thousand rupees as may be prescribed by the Central Government;

(d) Such other documents, as may be prescribed by the Central Government.

**Renewal of Licence:**

An application for renewal of a licence shall be—

(a) In such form;

(b) Accompanied by such fees, not exceeding five thousand rupees, as may be prescribed by the Central Government and shall be made not less than forty-five days before the date of expiry of the period of validity of the licence.

**Procedure for Grant or Rejection of Licence:**

The Controller may, on receipt of an application under sub-section (1) of section 21, after considering the documents accompanying the application and such other factors, as

He deems fit, grant the licence or reject the application:

Provided that no application shall be rejected under this section unless the applicant has been given a reasonable opportunity of presenting his case.

### 1.3.4 Disclosure

(1) Every Certifying Authority shall disclose in the manner specified by regulations—

(a) its Digital Signature Certificate which contains the public key corresponding to the private key used by that Certifying Authority to digitally sign another Digital Signature Certificate;

(b) Any certification practice statement relevant thereto;

(c) Notice of the revocation or suspension of its Certifying Authority certificate, if any; and

(d) Any other fact that materially and adversely affects either the reliability of a Digital Signature Certificate, which that Authority has issued, or the Authority's ability to perform its services.

(2) Where in the opinion of the Certifying Authority any event has occurred or any situation has arisen which may materially and adversely affect the integrity of its computer system or the conditions subject to which a Digital Signature Certificate was granted, then, the Certifying Authority shall—

(a) Use reasonable efforts to notify any person who is likely to be affected by

that occurrence; or

(b) Act in accordance with the procedure specified in its certification practice statement to deal with such event or situation.

### 1.3.5 Penalties and Adjudication

If any person without permission of the owner or any other person who is in charge of a

computer, computer system or computer network, —

(a) Accesses or secures access to such computer, computer system or computer network;

(b) downloads, copies or extracts any data, computer data base or information from such computer, computer system or computer network including information or data held or stored in any removable storage medium; (c) I introduces or causes to be introduced any computer contaminant or computer virus into any computer, computer system or computer network;

(d) damages or causes to be damaged any computer, computer system or computer network, data, computer data base or any other programmes residing in such computer, computer system or computer network;

(e) Disrupts or causes disruption of any computer, computer system or computer network;

(f) Denies or causes the denial of access to any person authorized to access any computer, computer system or computer network by any means;

(g) provides any assistance to any person to facilitate access to a computer, computer system or computer network in contravention of the provisions of this Act, rules or regulations made thereunder;

(h) Charges the services availed of by a person to the account of another person by tampering with or manipulating any computer, computer system, or computer

Network, he shall be liable to pay damages by way of compensation not exceeding one core rupees to the person so affected.

**Penalty for Failure to Furnish Information Return, etc.**

If any person who is required under this Act or any rules or regulations made thereunder to—

(a) furnish any document, return or report to the Controller or ?he Certifying Authority fails to furnish the same, he shall be liable to a penalty not exceeding one lakh and fifty thousand rupees for each such failure;

(b) file any return or furnish any information, books or other documents within the time specified therefor in the regulations fails to file return or furnish the same within the time specified therefor in the regulations, he shall be liable to a penalty not exceeding five thousand rupees for every day during which such failure continues;

(c) Maintain books of account or records, fails to maintain the same, he shall be liable to a penalty not exceeding ten thousand rupees for every day during which the failure continues.

**Residuary Penalty.**

Whoever contravenes any rules or regulations made under this Act, for .the contravention of which no penalty has been separately provided, shall be liable to pay a compensation not exceeding twenty-five thousand rupees to the person affected by such contravention or a penalty not exceeding twenty-five thousand rupees.

**Power to Adjudicate:**

(1) For the purpose of adjudging under this Chapter whether any person has committed a contravention of any of the provisions of this Act or of any rule, regulation, direction or order made thereunder the Central Government shall, subject to the provisions of sub-section (3), appoint any officer not below the rank of a Director to the Government of India or an equivalent officer of a State Government

to be an adjudicating officer' for holding an inquiry in the manner prescribed by the Central Government.

(2) The adjudicating officer shall, after giving the person referred to in sub-section (1) a reasonable opportunity for making representation in the matter and if, on such inquiry, he is satisfied that the person has committed the contravention, he may impose such penalty or award such compensation as he thinks fit in accordance with the provisions of that section.

(3) No person shall be appointed as an adjudicating officer unless he possesses such experience in the field of Information Technology and legal or judicial experience as May Be prescribed by the Central Government.

(4) Where more than one adjudicating officers are appointed, the Central Government shall specify by order the matters and places with respect to which such Officers shall exercise their jurisdiction.

(5) Every adjudicating officer shall have the powers of a civil court which are conferred oh the Cyber Appellate Tribunal under sub-section (2) of section 58, and—

(a) All proceedings before it shall be deemed to be judicial proceedings within the meaning of sections 193 and 228 of the Indian Penal Code;

(b) Shall be deemed to be a civil court for the purposes of sections 345 and 346 of the Code of Criminal Procedure, 1973.

### 1.3.6 Miscellaneous

**Offences:**

**Tampering with Computer Source Documents:** Whoever knowingly or intentionally conceals, destroys or alters or intentionally or knowingly causes another to conceal, destroy or alter any computer source code used for a computer, computer programmed, computer system or computer network, when the

computer source code is required to be kept or maintained by law for the time being in force, shall be punishable with imprisonment up to three years, or with fine which may

extend up to two lakh rupees, or with both. *Explanation.* — For the purposes of this section, "computer source code" means the listing of programmes, computer commands, design and layout and programmed analysis of computer resource in any form.

**Hacking with Computer System.**

(1) Whoever with the intent to cause or knowing that he is likely to cause wrongful loss or damage to the public or any person destroys or deletes or alters any information residing in a computer resource or diminishes its value or utility or affects it injuriously by any means, commits hack:

(2) Whoever commits hacking shall be punished with imprisonment up to three years, or with fine which may extend up to two lakh rupees, or with both.

**Publishing of Information Which is Obscene in Electronic Form:** Whoever publishes or transmits or causes to be published in the electronic form, any material which is lascivious or appeals to the prurient interest or if its effect is such as to tend to deprave and corrupt persons who are likely, having regard to all relevant circumstances, to read, see or hear the matter contained or embodied in it, shall be punished on first conviction with imprisonment of either description for a term which may extend to five years and with fine which may extend to one lakh rupees and in the event of a second or subsequent conviction with imprisonment

of either description for a term which may extend to ten years and also with fine which may extend to two lakh rupees.

**Power of Controller to Give Directions:** The Controller may, by order, direct a Certifying Authority or any employee of such Authority to take such measures or cease carrying on such activities as specified in the order if those are necessary to ensure compliance with the provisions of this Act, rules or any regulations made there under.

**Controller, Deputy Controller and Assistant Controllers to be Public Servants:** The Presiding Officer and other officers and employees of a Cyber Appellate Tribunal, the Controller, the Deputy Controller and the Assistant Controllers shall be deemed to be public servants within the meaning of section 21 of the Indian Penal Code.

**Power to Give Directions:** The Central Government may give directions to any State Government as to the carrying into execution in the State of any of the provisions of this Act or of any rule, regulation or order made thereunder.

**Offences by Companies:** Where a person committing a contravention of any of the provisions of this Act or of any rule, direction or order made thereunder is a company, every person who, at the time the contravention was committed, was in charge of, and was responsible to, the company for the conduct of business of the company as well as the company, shall be guilty of the contravention and shall be liable to be proceeded against and punished accordingly.

## 14.4 Data Communication

Data Communications concerns the transmission of digital messages to devices external to the message source. "External" devices are generally thought of as being independently powered circuitry that exists beyond the chassis of a computer or other digital message source. As a rule, the maximum permissible transmission rate of a message is directly proportional to signal power and inversely proportional to channel noise.

### 14.4.1 Meaning of Data Communication

The Data Communication is the exchange of data between two devices via some form of transmission medium such as wire cable. The communicating system must be part of a communication system made up of a combination of hardware and software. The effectiveness of a data communication system depends on three fundamental characteristics: delivery & accuracy.

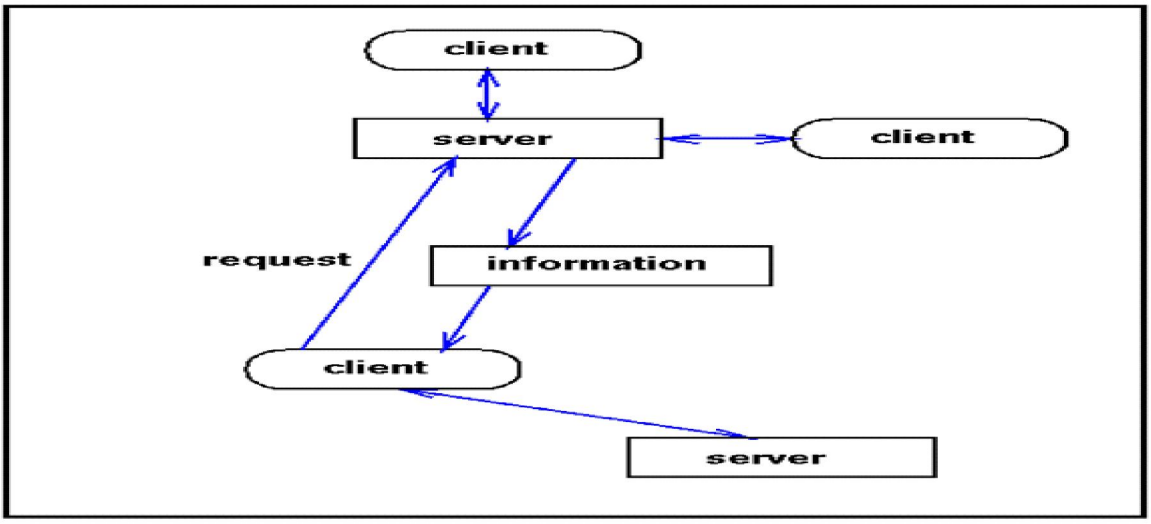


**Figure - 14.2**

The process of transmission of information from one location to another location is called data communication. Certain hardware, software and procedures are used in Data Communication. Communication, the transfer of information, is the basis office automation. Electronic communication consists of telecommunication and data communication. Telecommunication is the use of telephone, telegraph, radio, television facilities to transmit information. Data communication is the transfer of data or information between computer devices.

Office automation integrates the two examples for data communication:

- Airline reservation
- Automated banking
- Point of sale terminal

In all the cases, the data base is located at a central place and the data communication process is done from various terminals. A system, modem, a communication network and the remote computers hardware and software should work in tandem for a successful exchange of data.

It is the process of transporting data from one point to another. Networks are communication system designed to convey information from one point of origin to a point of destination. It is a communication system not computers system. Network can be a local area network or a long haul network (ex: Telephone Network) communication system will be successful when the message is in understandable form. In other words Data Communications concerns the transmission of digital messages to devices external to the message source. "External" devices are generally thought of as being independently powered circuitry that exists beyond the chassis of a computer or other digital message source. As a rule, the maximum permissible transmission rate of a message is directly proportional to signal power and inversely proportional to channel noise. It is the aim of any communications system to provide the highest possible transmission rate at the lowest possible power and with the least possible noise.

**Communications Channels:** A communications channel is a pathway over which information can be conveyed. It may be defined by a physical wire that connects communicating devices, or by a radio, laser, or other radiated energy source that has no obvious physical presence. Information sent through a communications channel has a source from which the information originates, and a destination to which the information is delivered. Although information originates from a single source, there may be more than one destination, depending upon how many receive stations are linked to the channel and how much energy the transmitted signal possesses. In a digital communications channel, the information is represented by individual data bits, which may be encapsulated into multibit message units. A byte, which consists of eight bits, is an example of a message unit that may be conveyed through a digital communications channel. A collection of bytes may itself be grouped into a frame or other higher-level message unit. Such multiple levels of encapsulation facilitate the handling of messages in a complex data communications network. The message source is the transmitter, and the destination is the receiver. A channel whose direction of transmission is unchanging is referred to as a simplex channel. For example, a radio station is a simplex channel because it always transmits the signal to its listeners and never allows them to transmit back.

**(1) Half-duplex Channel:** A half-duplex channel is a single physical channel in which the direction may be reversed. Messages may flow in two directions, but never at the same time, in a half-duplex system. In a telephone call, one party speaks while the other listens. After a pause, the other party speaks and the first party listens. Speaking simultaneously results in garbled sound that cannot be understood.

**(2) Full-duplex Channel:** A full-duplex channel allows simultaneous message exchange in both directions. It really consists of two simplex channels, a forward channel and a reverse channel,

linking the same points. The transmission rate of the reverse channel may be slower if it is used only for flow control of the forward channel.

**Serial Communications:** Serial communication is the process of sending data one bit at a time, sequentially, over a communication channel or computer bus. This is in contrast to parallel communication, where several bits are sent as a whole, on a link with several parallel channels. Serial communication is used for all long-haul communication and most computer networks, where the cost of cable and synchronization difficulties make parallel communication impractical. Serial computer buses are becoming more common even at shorter distances, as improved signal integrity and transmission speeds in newer serial technologies have begun to outweigh the parallel bus's advantage of simplicity and to outstrip its disadvantages.

### 1.4.2 Data Communication System

Five Basic Components:

1. Sending or Originating computer, where the terminal has to transmit the data. The data can be a file on a disk or may be entered on a keyboard.
2. Sending Computer should have communication device that convert the data into the form that can be transmitted.
3. Communication link to carry the data from place to place ex : Telephone Lines
4. A device should be attached at the receiver's computer to convert the data into the form that the receiving computer can understand.
5. The receiving computer should convert the data and display them or print them or store them in a file.

### 1.4.3 Data Compression

Data compression is also widely used in backup utilities, spreadsheet applications, and database management systems. It is particularly useful in communications because it enables devices to transmit or store the same amount of data in fewer bits. There are a variety of data compression techniques, but only a few have been standardized. If a typical message were statistically analyzed, it would be found that certain characters are used much more frequently than others. By analyzing a message before it is transmitted, short binary codes may be assigned to frequently used characters and longer codes to rarely used characters. In doing so, it is possible to reduce the total number of characters sent without altering the information in the message. Appropriate decoding at the receiver will restore the message to its original form. This procedure, known as data compression, may result in a 50 percent or greater savings in the amount of data transmitted. Even though time is necessary to analyze the message before it is transmitted, the savings may be great enough so that the total time for compression, transmission, and decompression will still be lower than it would be when sending an uncompressed message. Data compression can be depicted as under:

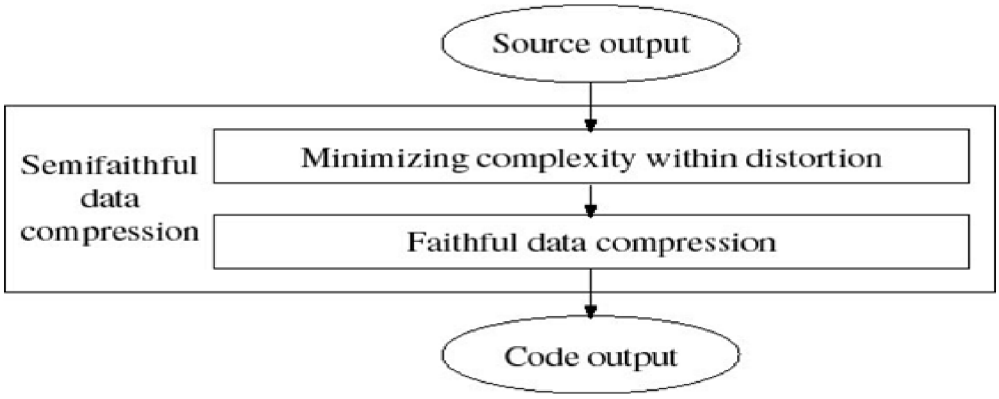


**Figure - 14.3**

### 14.4.4 Data Encryption & its Need

Encryption uses a mathematical algorithm to scramble readable text that cannot be read unless the reader has the key to "unlock," or convert, the information back to its readable form. This means that your sensitive data cannot be accessed without you providing a password. Secrecy is a great concern in data communications. Faxed business letters can be intercepted at will through tapped phone lines or intercepted microwave transmissions without the knowledge of the sender or receiver. To increase the security of this and other data communications, including digitized telephone conversations, the binary codes representing data may be scrambled in such a way that unauthorized interception will produce an indecipherable sequence of characters. Authorized receive stations will be equipped with a decoder that enables the message to be restored. The process of scrambling, transmitting, and descrambling is known as encryption.

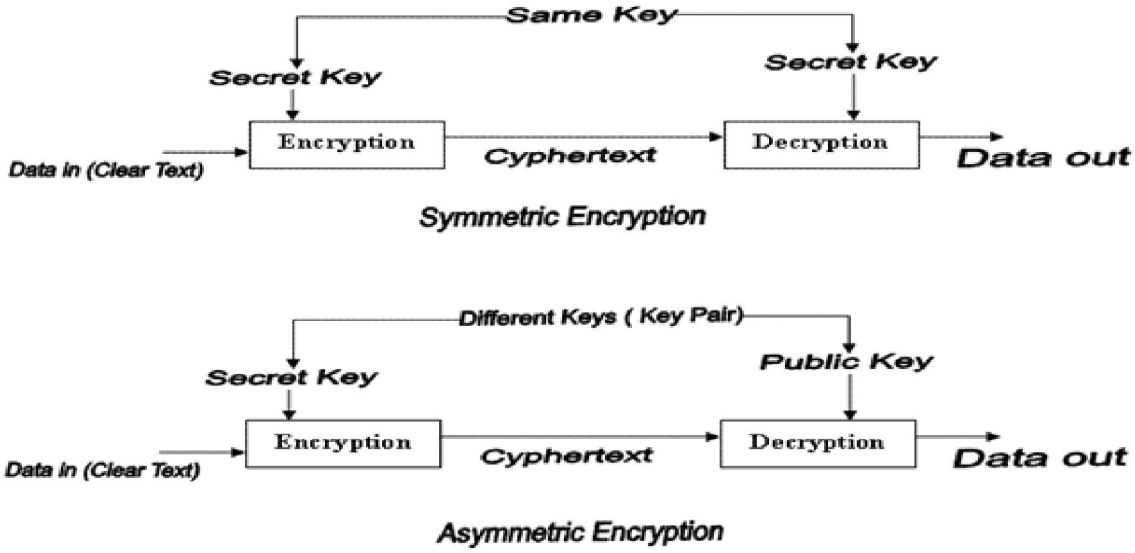


**Figure - 14.4**

Custom integrated circuits have been designed to perform this task and are available at low cost. In some cases, they will be incorporated into the main circuitry of a data communications device and function without operator knowledge. In other cases, an external circuit is used so that the device, and its encrypting/decrypting technique, may be transported easily.

**Need of Encryption:** It is the easiest and most practical method of protecting data stored or transmitted electronically and is particularly essential with sensitive data.

Even a single failure to encrypt sensitive data, whether through e-mail or via a stolen flash drive or laptop, can result in a security breach with criminal or civil liabilities and irreparable harm to finances and the reputation of the university.

The following items—while not a comprehensive list—are examples of sensitive data:

- Social Security numbers
- Credit card numbers
- Debit card numbers
- Bank account details
- Driver's license numbers
- Student information
- Legal data

## 14.5 Digital Signature

Digital signature is an electronic signature that can be utilized to authenticate the identity of the sender of a message or the signer of a document, and certainly to ensure that the original content of the message or document that has been sent is the same or unchanged.

### 14.5.1 Meaning & Definitions of Digital Signature

A digital signature or digital signature scheme is a mathematical scheme for demonstrating the authenticity of a digital message or document. A valid digital signature gives a recipient reason to believe that the message was created by a known sender, and that it was not altered in transit. Digital signatures are commonly used for software distribution, financial transactions, and in other cases where it is important to detect forgery or tampering.

A digital signature (not to be confused with a digital certificate) is an electronic signature that can be used to authenticate the identity of the sender of a message or the signer of a document, and possibly to ensure that the original content of the message or document that has been sent is unchanged. Digital signatures are easily transportable, cannot be imitated by someone else, and can be automatically time-stamped. The ability to ensure that the original signed message arrived means that the sender cannot easily repudiate it later.

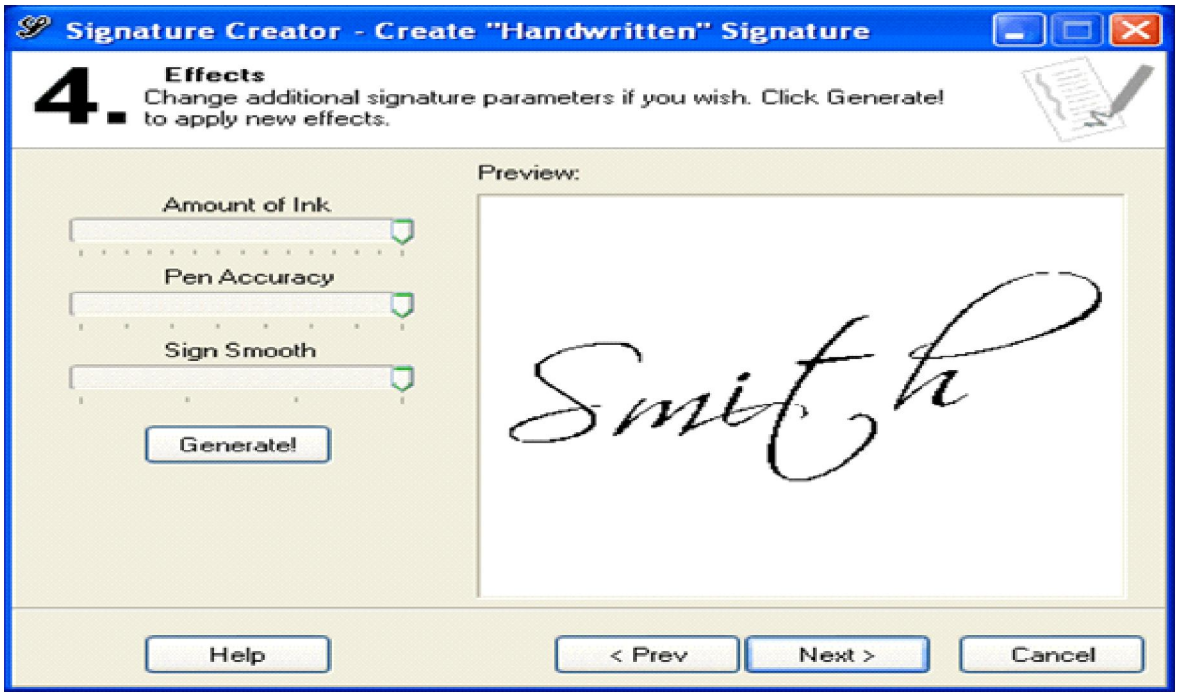


**Figure - 14.5**

A digital signature can be used with any kind of message, whether it is encrypted or not, simply so that the receiver can be sure of the sender's identity and that the message arrived intact. A digital certificate contains the digital signature of the certificate-issuing authority so that anyone can verify that the certificate is real.

You can digitally sign a document for many of the same reasons why you might place a handwritten signature on a paper document. A digital signature is used to help authenticate the identity of the creator of digital information — such as documents, e-mail messages, and macros — by using cryptographic algorithms. Digital signatures are based on digital certificates. Digital certificates are verifiers of identity issued by a trusted third party, which is known as a certification authority (CA). This works similarly to the use of standard identity documents in a non-electronic environment. For example, a trusted third party such as a

government entity or employer issues identity documents — such as driver's licenses, passports and employee ID cards — on which others rely to verify that a person is whom he or she claims to be.

**Definition**

**According to P.N.Mills:-**

**"**A digital signature or e-signature for short (not to be confused with a digital certificate) is an electronic signature that can be utilized to authenticate the identity of the sender of a message or the signer of a document, and certainly to ensure that the original content of the message or document that has been sent is the same or unchanged.**"**

**According to L.N.Hawk:-**

**"**Digital signatures can be defined as the ability to ensure that the original signed message arrived means that the sender cannot easily repudiate it later**"**

In other words a digital signature can be used with any kind of message, transactions and the like, whether it is encrypted or not, simply so that the receiver can be sure of the sender's identity and that the message arrived intact.

**What Digital Signatures Accomplish**

Digital signatures help establish the following authentication measures:

- **Authenticity** The digital signature helps ensure that the signer is whom he or she claims to be. This helps prevent others from pretending to be the originator of a particular document (the equivalent of forgery on a printed document).
- **Integrity** The digital signature helps ensure that the content has not been changed or tampered with since it was digitally signed. This helps prevent documents from being intercepted and changed without knowledge of the originator of the document.
- **Non-repudiation** The digital signature helps prove to all parties the origin of the signed content. "Repudiation" refers to the act of a signer's denying any association with the signed content. This helps prove that the originator of the document is the true originator and not someone else, regardless of the claims of the signer. A signer cannot repudiate the signature on that document without repudiating his or her digital key, and therefore other documents signed with that key.

**1.5.2 Need for Digital Signatures**

To establish these conditions, the content creator must digitally sign the content by using a signature that satisfies the following criteria:

- The digital signature is valid. A CA that is trusted by the operating system must sign the digital certificate on which the digital signature is based.
- The certificate that is associated with the digital signature is not expired.
- The signing person or organization (known as the publisher) is trusted by the recipient.
- The certificate associated with the digital signature is issued to the signing publisher by a reputable CA.

Microsoft Office Word 2007, Microsoft Office Excel 2007, and Microsoft Office PowerPoint 2007 detect these criteria for you and warn you if there appears to be a problem with the digital signature. Information

about problematic certificates is easily viewed in a certificate task pane that appears in the 2007 Microsoft Office system application. 2007 Office system applications let you add multiple digital signatures to the same document.

### 1.5.3 How It Works

Assume you were going to send the draft of a contract to your lawyer in another town. You want to give your lawyer the assurance that it was unchanged from what you sent and that it is really from you.

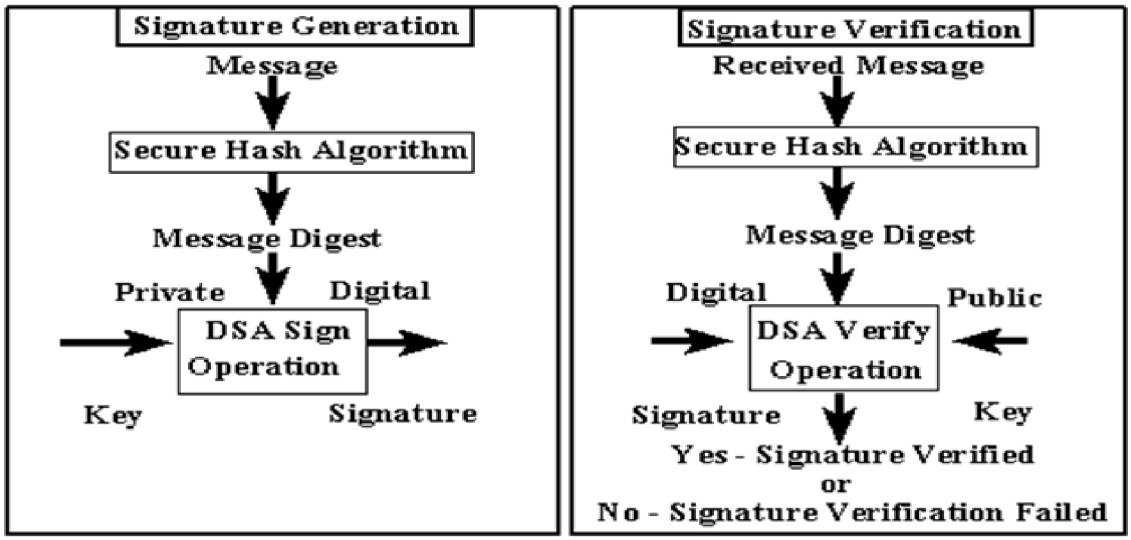


**Figure - 14.6**

1. You copy-and-paste the contract (it's a short one!) into an e-mail note.
2. Using special software, you obtain a message hash (mathematical summary) of the contract.
3. You then use a private key that you have previously obtained from a public-private key authority to encrypt the hash.
4. The encrypted hash becomes your digital signature of the message. (Note that it will be different each time you send a message.)

**Digital Signatures & Business Environment**

The following scenario illustrates how digital signing of documents can be used in a business environment:

1. An employee uses Office Excel 2007 to create an expense report. The employee then creates three signature lines: one for herself, one for her manager, and one for the accounting department. These lines are used to identify that the employee is the originator of the document, that no changes will occur in the document as it moves to the manager and the accounting department, and that there is proof that both the manager and the accounting department have received and reviewed the document.
2. The manager receives the document and adds her digital signature to the document, confirming that she has reviewed and approved it. She then forwards it to the accounting department for payment.
3. A representative in the accounting department receives the document and signs it, which confirms receipt of the document.

This example demonstrates the ability to add multiple signatures to a single 2007 Office system document. In addition to the digital signature, the signer of the document can add a graphic of her actual signature, or use a Tablet PC to actually write a signature into the signature line in the document. There is also a "rubber stamp" feature that can be used by departments, which indicates that a member of a specific department received the document.

### 1.5.4 Advantages of Digital Signatures

The advantages of using digital signatures include:

- **Imposter Prevention**: By using digital signatures you are eliminating the possibility of committing fraud by an imposter signing the document. Since the digital signature cannot be altered, this makes forging the signature impossible.
- **Message Integrity**: By having a digital signature you are in fact proving the document to be valid. You are assuring the recipient that the document is free from forgery or false information.
- **Legal Requirements**: Using a digital signature satisfies some type of legal requirement for the document in question. A digital signature takes care of any formal legal aspect of executing the document.

### Disadvantages of Digital Signatures

The disadvantages of using digital signatures involve the primary avenue for any business: money. This is because the business may have to spend more money than usual to work with digital signatures including buying certificates from certification authorities and getting the verification software. The disadvantages of Digital Signature include security concerns, technological compatibility issues as well as money.

Though the use of Digital Signatures is very powerful way to secure and authenticate a message or document, its advantages are hampered by lost or theft of keys and the use of vulnerable storage facilities. Furthermore, a number of Digital Signature standard exist which are incompatible with each other and there is a strong need of a standard through which these they can interact. Also the use of Digital Signature required additional money to be spent by the business in order to obtain Digital Signature services. This includes paying for the issuance of a Digital Signature as well as for the software that will be used to generate the Digital Signature.

### 1.5.5 Legal Aspect of Digital Signature

**Legal Recognition of Digital Signatures:** Where any law provides that information or any other matter shall be authenticated by affixing the signature or any document shall be signed or bear the signature of any person (hen, notwithstanding anything contained in such law, such requirement shall be deemed to have been satisfied, if such information or matter is authenticated by means of digital signature affixed in such manner as may be prescribed by the Central Government.

**Use of Electronic Records and Digital Signatures in Government and its Agencies:**

(1) Where any law provides for—

(a) The filing of any form. Application or any other document with any office, authority, body or agency owned or controlled by the appropriate Government in a particular manner;

*(b)* The issue or grant of any licence, permit, sanction or approval by whatever name called in a particular manner;

(c) the receipt or payment of money in a particular manner, then, notwithstanding anything contained in any other law for the time being in force, such requirement shall be deemed to have been satisfied if such filing, issue, grant, receipt or payment, as the case may be, is effected by means of such electronic form as may be prescribed by the appropriate Government.

(2) The appropriate Government may, for the purposes of sub-section (1), by rules, prescribe—

(a) the manner and format in which such electronic records shall be filed, created or issued;

*(b)* the manner or method of payment of any fee or charges for filing, creation or issue any electronic record under clause.

**Power to make rules by Central Government in Respect of Digital Signature:**

The Central Government may, for the purposes of this Act, by rules, prescribe—

(a) the type of digital signature;

*(b)* the manner and format in which the digital signature shall be affixed;

(c) the manner or procedure which facilitates identification of the person affixing the digital signature;

(d) control processes and procedures to ensure adequate integrity, security and confidentiality of electronic records or payments; and

(e) Any other matter which is necessary to give legal effect to digital signatures.

**Secure Digital Signatures:** Where any security procedure has been applied to an electronic record at a specific point of time. Then such record shall be deemed to be a secure electronic record from such point of time to the time of verification. If, by application of a security procedure agreed to by the parties concerned, it can be verified that a digital signature, at the time it was affixed, was—

(A) Unique to the subscriber affixing it;

*(B)* Capable of identifying such subscriber;

(c) created in a manner or using a means under the exclusive control of the subscriber and is linked to the electronic record to which it relates in such a manner that if the electronic record was altered the digital signature would be invalidated, then such digital signature shall be deemed to be a secure digital signature.

## 14.6 Summary

It may be conclude that electronic commerce is an electronic information exchange between a business and its customers. This can be done by fax, phone, voice-mail1, e-mail, Extranet or Internet. In the narrow sense of electronic commerce is a complex solution that provides Internet technology. Whereas digital signature or digital signature scheme is a mathematical scheme for demonstrating the authenticity of a digital message or document.

## 14.7 Self Assessment Questions

1. What do you mean by digital signature? Explain it with the help of suitable example.
2. What are the different legal aspects of IT security? How do these influence business in the present scenario?

3. Define data communication? Explain the difference between data encryption and data compression.

4. "Data communication system follow as fix sequence" Explain the statement with suitable diagram.

5. Write short note on the following:
   1. Penalties of IT act 2000
   2. License procedure
   3. Need of Encryption.

6. Digital signature has advantages as well as disadvantages explain.

## 14.8 Reference Books


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# Unit - 15 : e-Commerce

**Structure of Unit:**



## 15.0 Objectives

After completing this unit, you will be able to:

- Understand the concept of e- Commerce;
- Know the issues related to e-Commerce;
- Learn about the direction and future of e-Commerce.

## 15.1 Introduction

The cutting edge for business today is Electronic Commerce (e-commerce). Most people think E-commerce means online shopping. But Web shopping is only a small part of the E-commerce picture. The term also refers to online stock, bond transactions, buying and downloading software without ever going to a store. In addition, E-commerce includes business-to-business connections that make purchasing easier for big corporations. While there is no one correct definition of E-commerce, it is generally described as a method of buying and selling products and services electronically. The main vehicles of E-commerce remain the Internet and the World Wide Web, but use of email, fax, and telephone orders are also prevalent.

### 15.1.1 What is e-commerce

By definition, e-commerce means the buying or selling of goods and services over the Internet. According to the Pew Internet & American Life Project, 66 percent of the adults online have purchased something over the Internet, whether it's books, shoes or a Caribbean cruise.

Electronic commerce is the application of communication and information sharing technologies among trading partners to the pursuit of business objectives. E-Commerce can be defined as a modern business methodology that addresses the needs of organizations, merchants, and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery. E-commerce is associated with the buying and selling of information, products and services via computer networks. Key element of e-commerce is information processing. The effects of e-commerce are already appearing in all areas of business, from customer service to new product design. It facilitates new types of information based business processes for reaching and interacting with customers – online advertising and marketing, online-order taking and on-line customer service etc. It can also reduce costs in managing orders and interacting with a wide range of suppliers and trading partners, areas that typically add significant overhead to the cost of products and services. Also E-commerce enables the formation of new types of information-based products such as interactive games, electronic books, and information-on demand that can be very profitable for content providers and useful for consumers. Virtual enterprises are business arrangements in which trading partners separated by geography and expertise are able to engage in complex joint business activities, as if they were

a single enterprise. One example would be true supply chain integration, where planning and forecast data are transmitted quickly and accurately throughout a multi-tier supply chain. Another example would be non-competing suppliers with a common customer using E-commerce to allow that customer to do 'one stop shopping' with the assurance that a single phone call will bring the right materials to the right location at the right time.

### 15.1.2 History of e-commerce

The history of Ecommerce seems rather short but its journey started over 40 years ago in hushed science labs. Its early beginnings started during the cold war years when the world was racing to build missile defense systems but, the history of modern Ecommerce is relativity short having its beginnings in the mid 1990s.

***The Early Years:*** In the 1960s, very early on in the history of Ecommerce, its purpose was to exchanging electronic data long distance. In these early days of Ecommerce, users consisted of only very large companies, such as banks and military departments, who used it for command control communication purposes. This was called EDI, and was used for electronic data interchange.

In the late 1970s a new protocol was developed known as ASC X12 which was used for the exchange of business documents and information electronically.

Another system was being developed at the same time by the Military known as ARPAnet, and was the first to use the "dial up" method of sending information via telephone networks. It was considered the grandfather of the modern Internet.

In 1982 Transmission Control Protocol and Internet Protocol known as TCP & IP was developed. This was the first system to send information in small packets along different routes using packet switching technology, like today's Internet! As opposed to sending the information streaming down one route.

These were amongst the largest developments in the history of Ecommerce that set the stage for a revolution in the exchange of electronic data, but it was not for another quarter of a century that Ecommerce became accessible to everyday people.

***Beginnings of an Electronic Revolution:*** The Internet took a giant leap into the modern age in 1991 when a computer scientist working under contract for CERN 'Tim Berners-Lee' made a huge advancement by communicating via the Internet using HTTP. The birth of the World Wide Web was upon us!

He is now considered the father of the World Wide Web. This opened up the door for everyday people to use this wonderful new technology. However, it was not until 1994 that the first truly user friendly browser was developed with built in security protocol to protect peoples personal information online.

This made way for secure transactions to be conducted on the internet. A year later 3rd party credit card payment services became available to the still small online community. The stage was set, and the future of Ecommerce was about to take off.

In 1995, with the introduction of *online payment methods*, two companies that we all know of today took their first steps into the world of Ecommerce. Today Amazon and Ebay are both amongst the most successful companies on the Internet.

One month after selling his first book online, founder of Amazon Jeff Bezos was selling to every state in the U.S and over 40 other countries. Ecommerce allowed the easy processing of orders and shipping also enabling him to buy directly from the publishers.

Ebay saw growth that was just as staggering. By allowing anyone to buy and sell online, in just a few short

years the company became a household name with a turnover of hundreds of millions a year.

From its humble beginning in 1995 modern Ecommerce has become the fastest growing area of business, showing continued growth year after year.

Technology has advanced further making it so much more accessible to people from all walks of life, and entire industries have been built around Ecommerce which are today, the who's who of the business world.

Today virtually anything can be purchased online, from your pizza to your car. People love to shop online, figures show that in the U.S over 60% of adults have purchased goods online this is a figure that is set to explode over the coming years as the youth of today mature fast, being the first to have been raised with this exciting environment interwoven into all aspects of life. If there is one thing we can learn from the history of Ecommerce it is that anyone given a little motivation and drive can become successful. It has never been easier to get a foothold into the exciting online world of Ecommerce, all anyone needs is an internet connection, a computer, and an idea. Ecommerce has become the great leveler, giving anyone the ability to *build an Ecommerce website*, and sell to a world wide market with outstanding results.

The history of Ecommerce has shown just how fast people can embrace a new technology. It has evolved in leaps and bounds to become what it is today and the future is looking bright.

### 15.1.3 Advantages of e-commerce

**Business Hours: 24/7** - Online store opens 24/7. Even while one is sleeping, customers can visit one's store, browse products and place their orders.

**Global Location** - It means everyone with internet connection, from countryside in England to a big city in China to the jungle of Kalimantan, can visit a store without having retailers on those places. An individual, on other hand, can manage his/her store almost anywhere they want.

**Niche Products** – A person can sell almost anything on the web. Even if the products are targeted to smaller market, like dentures, the buyers are out there, somewhere, on the net.

Pierre Omidyar, living in San Jose, California, coded a simple site called AuctionWeb. Curious if people would bid on each other's used items, he sold his broken laser pointer online. And someone actually bid it for $14.83. Omidyar sent an e-mail to the buyer. He wanted to make sure the buyer really knew he had bought a junk. Well, what do you know? "I'm a collector of broken laser pointers." The site has eventually been known as eBay.

**Lower Transaction Costs** - With a well-implemented online store one can automate many things. By atomization one can cut the costs on areas like documents preparation, error detection and correction, mail order catalogs, phone calls and labor costs.

**Easy Shelves Arrangement** - If a store has more than 1,000 products, wouldn't it be nice to arrange the 'shelves' within minutes? Well, with online stores it's really easy. One can also highlight feature products with few clicks. Doing so might increase the conversion rate.

**Convenient Shopping** - From customers' perspective, shopping online would be really cool because:

- They don't need to physically be on the store; they can browse through products in pyjamas, laying lazily on bed.
- They save more time and gas.
- They can browse through many products within minutes.
- They can compare prices easily.

- They can choose preferred payment gateway your online store offers.
- They can provide their important information (i.e. credit card number) more securely.
- They can do all those stuff above on the go.
- For certain products they can have better deals.

**Larger Purchases per Transaction** - Amazon has it, and other great online stores also have it. It's called cross sales. With cross sales feature enabled, when a buyer views a product, he'll see what other people who ordered the product also purchased. That way he can see related products bought by other people. If he likes those products, he'll buy them, too.

**Improved Customer Interactions** - Visitors are good, repeat visitors are better, but repeat visitors who actually buy from the store are the ones the owner really wants. So a person needs to plan and implement the best marketing strategies for his/her online store. It can be done quite easily.

**Transactions Recording** - A good business means a good transactions recording. And with online store one can automate it. There is no need to hire an employee for the job. Every online activity the customers engage in a store will be recorded. One can also view the records to analyze the growth of his/her store.

### 15.1.4 Disadvantages of e-Commerce

**Shipping Takes Time** - If a person sells physical goods, shipping it halfway round the world might take several days, weeks or even more. It means one cannot send certain products as fresh food or dairy products.

**Shipping Costs More** - The basic shipping cost rule is simple: the more the weight, the more the cost. If a person sells a couch to someone on another continent, the shipping cost would be ridiculous.

**Doubts and Fears** - Many people don't understand the awesomeness of shopping online. They are too afraid to buy something on the web because they doubt if the store is reliable, curious if the product is as good as it looks like on the site, afraid that the web stores would steal their money. Doubts and fears are human basic instincts. One has to embrace them to deal with them.

**Inability to Feel the Physical** - Online store doesn't provide the opportunity to actually touch, wear or sit on the product. Therefore selling such products as apparel and furniture online might be tricky.

**Harmful Malicious Codes** - The server backing up an online store might be infected by malicious codes. If that's the case, that online store might be the 'hellgate' that sends those little devils to its customers' computers.

**Shopping is Social Experience** - People love to shop in the mall because it gives them an opportunity to have fun with friends and family. It's something online stores lack.

**Too Many Competitors** – One can easily create an online store. Using WordPress e-commerce themes one can even do it in less than 5 minutes. Problem is, everyone else can, too. If there are thousands of online stores selling similar products, how can firms attract visitors so they actually buy from them and not from others?

### 15.1.5 Types of e-commerce

**Business-to-business E-commerce**: The Internet can connect all businesses to each other, regardless of their location or position in the supply chain. This ability presents a huge threat to traditional intermediaries like wholesalers and brokers. Internet connections facilitate businesses' ability to bargain directly with a range of suppliers — thereby eliminating the need for such intermediaries.

**Business-to-consumer E-commerce:** One-way marketing. Corporate web sites are still prominent distribution mechanisms for corporate brochures, the push, one-way marketing strategy.

**Purchasing over the Web:** Availability of secure web transactions is enabling companies to allow consumers to purchase products directly over the web. Electronic catalogues and virtual malls are becoming commonplace.

**Relationship Marketing**: The most prominent of these new paradigms is that of relationship marketing. Because consumer actions can be tracked on the web, companies are experimenting with this commerce methodology as a tool for market research and relationship marketing:

- Consumer survey forms on the web
- Using web tracking and other technology to make inferences about consumer buying profiles.
- Customizing products and services
- Achieving customer satisfaction and building long-term relationships

**Intra-company E-commerce**: Companies are embracing intranets at a phenomenal growth rate because they achieve the following benefits:

- **Reducing Cost** - lowers print-intensive production processes, such as employee handbooks, phone books, and policies and procedures.
- **Enhancing Communications** - effective communication and training of employees using web browsers builds a sense of belonging and community.
- **Distributing Software** - upgrades and new software can be directly distributed over the web to employees.
- **Sharing Intellectual Property** - provides a platform for sharing expertise and ideas as well as creating and updating content – 'Knowledge webs'. This is common in organizations that value their intellectual capital as their competitive advantage.
- **Testing Products** - allows experimentation for applications that will be provided to customers on the external web.

## 15.2 Issues in e-commerce

The vastness of Internet advertising offers a solid platform for Electronic Commerce (or e-commerce) to explode. E-Commerce has the ability to provide secure shopping transactions coupled with instant verification and validation of credit card transactions. E-Commerce is not about the technology itself, it is about doing business leveraging the technology. A technological innovation is followed by frequent incorporation of ethical standards into law. New forms of E-Commerce that enables new business practices have many advantages but also bring numerous risks.

### 15.2.1 Ethical Issues

**What is Ethics?:** Ethics is the branch of philosophy that studies what's right and wrong. Ethical rules are rules to follow in our interactions with other people and in our actions that affect other people. They apply to all and are intended to achieve good results for people in general, and for situations in general; not just for self, and not just for one situation. Different ethical theories attempt to achieve the same goal: to enhance

human dignity, peace, happiness, and well-being. "Do not lie" is a command of an ethical act, if it complies with ethical rules. For example, it is an ethical act not to lie, yet it is unethical to tell the murder the truth of his victim's whereabouts. Its principle of universality: We should follow rules of behavior that can universally apply to everyone. In other words, "Do unto others as you would have them do unto you" (Luke 6:31).

### Etical Issues in e-commerce

**Web Spoofing:** Web spoofing is an electronic **deception related to the Internet**. It occurs when **the attacker sets up a fake website** which is almost totally similar to the original website, in order to lure consumers to give their credit card numbers or other personal information.

For example, the attackers setup a site called *www.micros0ft.com* using the number zero in place of the letter O, which many users sometimes type by mistake. Users might find themselves in a situation that they do not notice they are using a bogus web-site and give their credit card details or other information.

**Cyber-Squatting:** Cyber-squatting is an activity in which **a person or firm registers, purchases and uses the existing domain name belonging to well-known organizations, for the purpose of infringing its trademarks.** This type of person or firm, called cyber-squatters usually **infringe the trademarks to extort payment from the original trademark's owner.** The extortion of payment occurs when they offer the prices far greater than the price at which they had purchased the organization's domain name.

Some cyber-squatters put up derogatory remarks about the person or company which the domain is meant to represent (***eg: www.walmartsucks.com***), in an effort to encourage the subject to re-buy their domain from them.

**Privacy Invasion:** This issue is related to consumers. **The privacy invasion occurs when the personal details belonging to consumers are exposed to the unauthorized party**. It may occur in 3 ways-

> **i.** Electronic commerce businesses **buy information about individuals such as their personal details, shopping habits and web page visitation listings**. This can be done with or without the individual's knowledge by using different computing technologies. A large number of web sites, which require users to create a member name, also ask for personal details. These details are then often sold on to companies to aid in the marketing and selling of their products.
>
> **ii. The personal information of consumers being transmitted may be intercepted by anyone other than the person whom it is intended for**. Protecting the privacy of communication is a great challenge, due to the very nature of the online medium and open network of digital telecommunications. It is technically and economically impossible to patch all the holes through which unauthorized intruders may gain access.
>
> **iii. Malicious programs delivered quietly via web pages could reveal credit card numbers, usernames, and passwords that are frequently stored in special files called cookies**. Because the internet is stateless and cannot remember a response from one web page view to another, cookies help solve the problem of remembering customer order information or usernames or passwords.

**Online Piracy:** Online piracy can be defined as **unauthorized copyright of electronic intellectual property such as e-books, music or videos**. This unethical activity occurs when the Internet users use the software and hardware technology in an illegal manner to transfer the electronic intellectual property over the Internet.

For example, some web-based applications such as ***www.napster.com*** have enabled large scale exploitation of music samples and audio formats. Software that is available free of cost on the Internet allows the transfer of music and videos without the authorization of rights holders. Moreover, CD burners and portable MP3 players allow copyright violations to occur rather easily.

**Email Spamming:** e-mail spamming, also known as unsolicited commercial e-mail (UCE), involves **using e-mail to send or broadcast unwanted advertisements or correspondence over the Internet**. The individuals who spam their e-mail usually are called spammers. Many spammers broadcast their e-mail for the purpose of trying to get people's financial information such as credit card or account bank numbers in order to defraud them.

The example of fraud using e-mail is that spammers will lure consumers to enter their personal information on fake websites using e-mail, forged to look like it is from an authorized organization such as a bank. The content of e-mail often directs the consumers to the fake website in order to lure them to fill their personal information such as credit card or bank account's details. This technique is called phishing.

### 15.2.2 Legal Issues

Internet fraud and its sophistication have grown even faster than the Internet itself. There is a chance of a crime over the internet when buyers and sellers do not know each other and cannot even see each other. During the first few years of e-commerce, the public witnessed many frauds committed over the internet. Let's discuss the legal issues specific to e-commerce.

**Fraud on the Internet:** E-commerce fraud popped out with the rapid increase in popularity of websites. It is a hot issue for both cyber and click-and-mortar merchants. The swindlers are active mainly in the area of stocks. The small investors are lured by the promise of false profits by the stock promoters. Auctions are also conductive to fraud, by both sellers and buyers. The availability of e-mails and pop up ads has paved the way for financial criminals to have access to many people. Other areas of potential fraud include phantom business opportunities and bogus investments.

**Copyright:** The copyright laws protect Intellectual property in its various forms, and cannot be used freely. It is very difficult to protect Intellectual property in E-Commerce. For example, if one buys a software, one has the right to use it and not the right to distribute it. The distribution rights are with the copyright holder. Also, copying contents from the website also violates copy right laws.

**Domain Names:** The competition over domain names is another legal issue. Internet addresses are known as domain names and they appear in levels. A top level name is *qburst.com*or *microsoft.com*. A second level name will be *qburst.com/blog.* Top level domain names are assigned by a central non-profit organization which also checks for conflicts or possible infringement of trademarks. Problems arise when several companies having similar names competing over the same domain name. The problem of domain names was alleviated somewhat in 2001 after several upper level names were added to com.

Another issue to look out for is Cyber squatting, which refers to the practice of registering domain names with the desire of selling it at higher prices.

Security features such as authentication, non-repudiation and escrow services can protect the sellers in e-commerce.

One needs to be careful while doing e-commerce activities. The need to educate the public about the ethical and legal issues related to e-commerce is highly important from a buyer as well as seller perspective.

## 15.3 Direction and Future of e-commerce

In an industry where change is the only constant, predicting what lies around the corner is anyone's guess. The last few years have seen consumer trends like mobile device adoption, the proliferation of broadband internet and social media change forever the way consumers interact with retailers and brands. As the latest new trends continue to go mainstream in 2012 – like video commerce, floating profiles, location based marketing and intelligent commerce device apps – retailers and brand direct companies face a harsh reality. It's no longer a matter of keeping up anymore; it is likely a key to staying in business.

The big question for retailers and brand direct companies isn't, therefore, how to second-guess the future, but rather how best to future proof their commerce platform to cope with whatever the 'next big thing' of tomorrow turns out to be. Consumers are the guide; they will choose their own path and companies need the correct tools and commerce partner to keep up with their fickle mind set.

Clearly, selecting a platform capable of integrating future social and technological advances will be the key. So as online commerce teams race to deliver engaging yet consistent user experiences across all touch points that capture the mind and wallet share, they are not restricted and will have the ability to innovate at the speed of consumer trends. That means working with a platform that makes it easy for them to reconfigure their environment as often as they need to create truly intelligent promotions, optimize all touch points and exploit this inbuilt flexibility to effectively pursue any future direction their purchasing communities might take.

**Time Equals Money:** Right now web content management, product content management, channel analytics, customer experience management, A/B testing, and achieving seamless order management across the entire multi-channel business and all the interaction touch points is proving essential to staying competitive. That's a big ask for today's commerce team, which is under intense time and resource pressures.

So maximizing brand performance increasingly depends on the ability to act and react quickly. And that's why retailers and brand direct companies increasingly need more than just the lowest cost solution. They need a platform that powers innovation 'on the fly' and makes it easy to master multiple functions across multiple touch points – including product content management, search engine optimization, checkout and payment, order management and shipping, multiple websites and localization, social media and more – with ease. And all without the need for time consuming or complex programming skills.

Agility has become the name of the game. Whether that's the ability to instantly tailor the storefront to increase relevance and conversion ratios, optimize online mobile device experience for targeted audience segments, or gaining real-time analytics across all touch points to establish what works best where – and why. Online commerce is no longer a secondary strategy; it is the primary and therefore requires a primary solution partner.

**Future Proofing Commerce Strategy:** So in this new mobile and social reality, standing still is not an option, and those online retailers that can adapt and innovate at speed will be best positioned to not just survive but thrive and grow in market as well as into new markets.

The question becomes what is the right investment for moving forward with right tools and services to keep pace. And do companies wish to rent, own or completely outsource commerce operations and technology.

Choosing a 'one size fits all' platform from a super vendor like IBM for example, might seem a safe bet that's pretty low risk. But on closer inspection, is this really the case? First it generally requires a commitment to roll all the technology to theirs in order to achieve the desired benefits. This creates the kind of "big bang" approach to conversion that is seldom on time, on budget and delivers the desired results before the target

has actually changed, thus resulting in a huge investment and company wide distraction to deliver something that may no longer be relevant.

Companies end up with a bloated commerce environment that is highly complex to manage, limited in agility and difficult to fine tune to the individual and unique commerce challenges of their business units, geographical regions and evolving business partner relationships.

**A Better Way:** It has been observed that saying fit to compete in the future will require agility at every level – and that includes into the back office and beyond to logistics, delivery and after sales services which need to work hand-in-hand with the commerce platform itself.

The 'one size fits all' platform approach is simply no longer nimble enough to support the agile commerce approach retailers, and brand direct companies need to remain competitive and 'top of mind' with consumers and purchasers. A better approach is a cost-effective eco-system of specialist partners that can deliver both the scale and genuine value-add commerce teams and revenue officers need, opening the way strategies that span touch points, business models, geographical locations, complexity of catalogue and transactional volumes.

So one needs to look for a commerce partner who has a long history of delivering an agile core coupled with the partnerships and client base to know what the trends are. To be constantly evaluating trends and reacting to them and is not committed to anything other than commerce success.

Experts predict a promising and glorious future of ecommerce in the 21st century. In the foreseeable future ecommerce will further confirm itself a major tool of sale. Successful ecommerce will become a notion absolutely inseparable from the web, because e-shopping is becoming more and more popular and natural. At the same time severe rivalry in the sphere of ecommerce services will intensify their development. Thus prevailing future trends of ecommerce will be the growth of Internet sales and evolution.

Each year number of ecommerce deals grows enormously. Sales volumes of on-line stores are more than comparable with those of 'brick-and-mortar' ones. And the tendency will continue, because a lot of people are 'imprisoned' by work and household duties, while Internet saves a lot of time and gives opportunity to choose goods at the best prices. Present-day Internet sales boom is the foundation for magnificent ecommerce future.

The 'quantity to quality' tendency of ecommerce is also becoming more and more obvious, as the Internet has excluded geographical factor from the sale. So it doesn't matter any more whether a store is situated in New York or London or in a small town. To survive, merchants will have to adapt rapidly to the new conditions. To attract more customers e-store-owners will have not only to increase the number of available services, but to pay more attention to such elements like attractive design, user-friendliness, appealing goods presentation, they will have to opportunely employ modern technologies for their businesses to become parts of ecommerce future.

Of course, those, who acquire e-stores earlier, get better chance for future success and prosperity, though an ecommerce site itself doesn't guarantee anything. Only an appropriate ecommerce solution in combination with thorough e-marketing and advertising can buy business insurance.

### 15.3.2 Future of e-commerce in India

Ecommerce in India is experiencing an exponential growth which shall continue for years to come owing to the penetration of Internet / Mobile in the untapped rural population and increasing User Base in the Tier 2 and Tier 3 cities. This is coupled with the ever increasing coverage of diverse products in the Ecommerce

platform.

The most important driving factor for the success of Ecommerce in India is increase in the level of trust for both the buyer and the seller. Since in the virtual world we don't have the privilege of touch and feel, which are basis for gaining trust, it becomes all the more challenging to persuade someone to buy.

**Some Entry Barriers to Ecommerce in India:**

1. Perception of product is missing in the Online Purchase - Indian buyers still prefer brick and mortar where we can try the product before purchasing.
2. India lacks aggressive consumer protection law - People are still skeptical about the quality of products purchased online. Most are still unaware as to where they can file their grievances in case bad quality products are delivered.
3. Penetration of Credit card is low especially in rural areas.

**Success Stories:** But despite these challenges there are the success stories of Flipkart, Snapdeal etc. They have successfully penetrated the Entry Barriers and are now perceived as a trustworthy medium to perform Online Shopping having won the confidence both of the customers and the vendors.

**Positive Indicators for Ecommerce in India:**

1. **Internet banking / Phone Banking.** High speed broadband internet penetration is increasing at a fast rate. People are getting accustomed to using Internet / Mobile banking to pay their bills, buy tickets and perform various financial transactions.
2. **Penetration of Mobile devices, smart Phones.** There has been a tremendous growth in the number of people using smart phones, tablets, and mobile devices. According to a recent survey, Mobile phone penetration in India is more than 60% and is expected to be over 90% by 2015. M-commerce has picked up in the Digital Market place. Study shows that a large number of smart phone and tablet owners plan to purchase more products on their handheld devices in the future, indicating a huge opportunity for the service in the country.
3. **Increased number of credit card users.** According to Credit Information Company CIBIL there is an immense increase in the usage of credit cards in the last few quarters. There is around 30% increase in average balances per borrower in the last one year.
4. **Encouraging the vendors.** Vendors are encouraged to sell their products through Digital Commerce channel. The offers that they provide to the aggregators are passed on to the end buyers as attractive discounts.
5. **COD**. The Cash-On-Delivery being offered by some Ecommerce providers intends to break the Entry barrier which existed due to the skeptical nature of costumers towards online payment.
6. Availability of large variety of product range which is generally not available in a single brick and mortar shop.

Therefore, Ecommerce in India has a bright future especially in the B2C scenario, thanks to the huge Indian population base, which provided a vast domestic consumer base and is now being exposed to latest technologies. According to a survey conducted by ASSOCHAM (Associated Chambers of Commerce and Industry of India), online retail industry has currently made the transactions of INR 20 billion and is growing consistently at the rate of 35%. It's likely to cross 70 billion by the year 2015.

## 15.4 Summary

Electronic commerce is the application of communication and information sharing technologies among trading partners to the pursuit of business objectives. It facilitates new types of information based business processes for reaching and interacting with customers – online advertising and marketing, online-order taking and on-line customer service etc. A technological innovation is followed by frequent incorporation of ethical standards into law. New forms of E-Commerce that enables new business practices have many advantages but also bring numerous risks. The increasing technological innovation in business which is reflected in the modern day business practices, will direct the very basic philosophy of business in the new millennium and the future of E-Commerce is full of promise and bright.

## 15.5 Self Assessment Questions

1. What do you mean by E-Commerce? Explain its advantages and disadvantages.
2. What are the issues that has to be dealt with due care by the business practitioners?

## 15.6 Reference Books


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