DKY27 - E- COMMERCE

Unit I:

Electronic Commerce - Introduction – benefits & impact - application - architectural frame work - media convergence. Electronic Commerce – Applications - Types. Business Models - Business to Business, Business to Customer, Customer to Customer. Basics of Internet and networking

Unit II:

Electronic payment systems – Overview - types - Requirements - digital token, smart cards, credit card. Digital Cash – Properties – Trust – Reliability. Financial Instruments - Debit Card - Point of Sale (POS) - E-Benefit Transfer - Smart Cards - Electronic Fund Transfer – Intelligent Agents. Online Credit Card – Types. Designing electronic payment systems. Secure Electronic Transactions (SET).

Unit III:

Electronic Data Interchange - applications in Business - Legal, Security, and Privacy Issues - EDI and Electronic Commerce. E-Commerce Application - Sales promotion – Advertising – Segmentation - Consumer Behavior analysis – PLC analysis.

Unit IV:

E-security - Firewalls - Virus - Security Protection and Recovery – Encryption. Authentication and Trust - Key management - Internet Security Protocols and Standards - Other Encryption issues.

UNIT V:

E-Com Strategies: Setting up e-commerce shop, nature of strategy & strategic. 7 Stages of Internet Marketing; Critical Success Factors for Internet Marketing. Legal and Ethical issues. Futures of E-Commerce - Cyber-laws - Entrepreneurial Opportunities - Embedded E-Commerce.

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Unit I

Electronic Commerce

Introduction

What is E-commerce?

E-commerce is abbreviated for Electronic Commerce. Its function is the transference of financial and other commerce related information using Information Technology and Telecommunications.

Definitions

Electronic Commerce ("e-commerce") has been defined by the Organisation for Economic Cooperation and Development ("OECD") to be 'commercial transactions, involving both organisations and individuals, that are based upon the processing and transmission of digitized data, including text, sound and visual images and that are carried out over open networks (like the Internet) or closed networks (like AOL or Minitel) that have a gateway onto an open network'.

These include electronically marketed products from business-to-consumer, which are 'intangibles such as travel and ticketing services, software, entertainment, banking, insurance and brokerage services, information services, legal services, real estate services, and increasingly health care, education and government services'.

The International Fiscal Association ("IFA") has, for the purpose of the National and General Reports released at the 55th Congress held in October, 2001, defined e-commerce to be 'commercial transactions in which the order is placed electronically and goods or services are delivered in tangible or electronic form and there is an ongoing commercial relationship'.

The transactions may be on an open network using non-proprietary protocols, like the Internet, or over proprietary networks like intranet or extranet'. Discrete sales (sporadic sales that do not involve substantial amounts) and transactions involving the use of electronic data interchange ("EDI") and electronic funds transfer ("EFT") and other electronic networks, that were extensively used prior to the 1990's have been excluded from the definition.

National Association of Software and Service Companies ("NASSCOM") defines e-commerce to be 'transactions where both the offer for sale and the acceptance of offer are made electronically'. According to Dr N L Mitra of the National Law School of India, Bangalore University, 'in e-commerce, offer and acceptance is done through the Internet, almost like mail order or telephone order'.

The significant point to be noted is that as defined above, e-commerce would include transactions involving delivery and payment in traditional manner if offer and acceptance of the offer is through a 'network'. The above definitions of e-commerce are crucial from the perspective of understanding the nature of transactions and the manner in which such transactions change traditional business practices.

Benefits and Impact of E-Commerce

The invention of faster internet connectivity and powerful online tools has resulted in a new commerce arena – E-commerce. Ecommerce offered many advantages to companies and customers but it also caused many problems.

Advantages of Ecommerce

- Faster buying/selling procedure, as well as easy to find products.
- Buying/selling 24/7.
- More reach to customers, there is no theoretical geographic limitations.
- Low operational costs and better quality of services.
- No need of physical company set-ups.
- Easy to start and manage a business.
- Customers can easily select products from different providers without moving around physically.

Disadvantages of Ecommerce

- Any one, good or bad, can easily start a business. And there are many bad sites which eat up customers' money.
- There is no guarantee of product quality.
- Mechanical failures can cause unpredictable effects on the total processes.
- As there is minimum chance of direct customer to company interactions, customer loyalty is always on a check.
- There are many hackers who look for opportunities, and thus an ecommerce site, service, payment gateways; all are always prone to attack

Applicationof Electronic Commerce

Retail and wholesale:

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

Cybermall is a single Website that offers different products and services at one Internet location. It attracts the customer and the seller into one virtual space through a Web browser.

Marketing:

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

Finance:

Financial companies are using E-commerce to a large extent.Customers can check the balances of their savings and loan accounts, transfer money to their other account and pay their bill through on-line banking or E-banking.

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

Manufacturing:

E-commerce is also used in the supply chain operations of a company.Some companies form an electronic exchange by providing together buy and sell goods, trade market information and run back office information such as inventory control.

This speeds up the flow of raw material and finished goods among the members of the business community.

Various issues related to the strategic and competitive issues limit the implementation of the business models.Companies may not trust their competitors and may fear that they will lose trade secrets if they participate in mass electronic exchanges.

Auctions:

Customer-to-Customer E-commerce is direct selling of goods and services among customers.It also includes electronic auctions that involve bidding. Bidding is a special type of auction that allows prospective buyers to bid for an item.

For example, airline companies give the customer an opportunity to quote the price for a seat on a specific route on the specified date and time.

Entertainment

E-Commerce application is widely used in entertainment area for video cataloging, multiplayer games, and interactive ads and for online discussion.

Education

In educational training also e-commerce has major role for interactive education, video conferencing, online class and for connecting different educational training centers.

E-Commerce Architecture

E-commerce is based on the client-server architecture.A **client** can be an application, which uses a Graphical User Interface (GUI) that sends request to a server for certain services.The **server** is the provider of the services requested by the client.

In E-commerce, a client refers to a **customer** who requests for certain services and the server refers to the **business application** through which the services are provided.The business application that provides services is deployed on a Web' server.

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

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

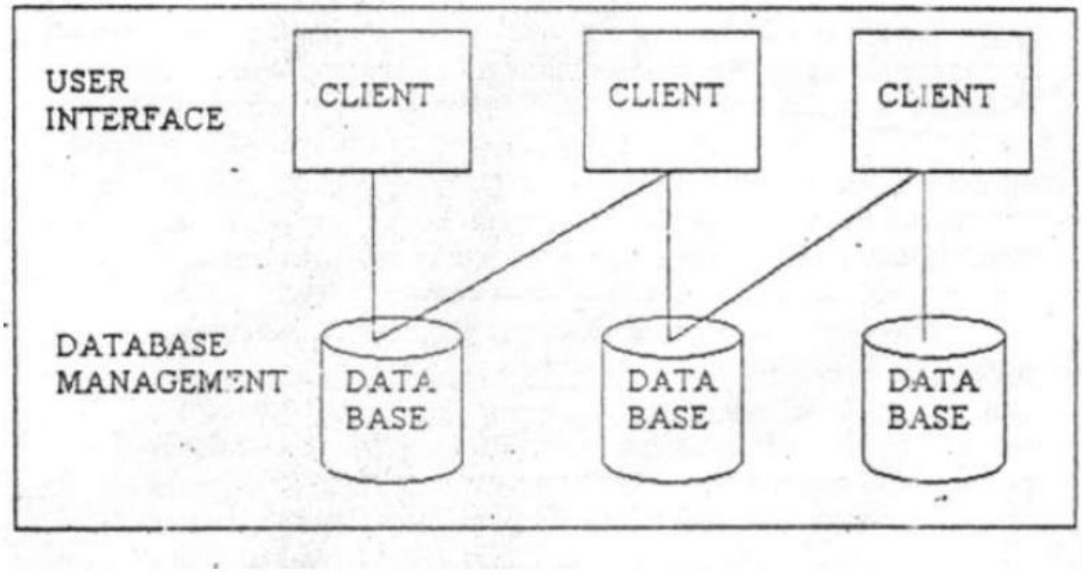
There are two types of client server architecture that E-commerce follows: two-tier and three-tier.

E- Commerce System Architecture: Two-tier architecture:

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

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

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



E commerce Architecture Two tier architecture

E- Commerce System Architecture: Three-tier architecture:

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

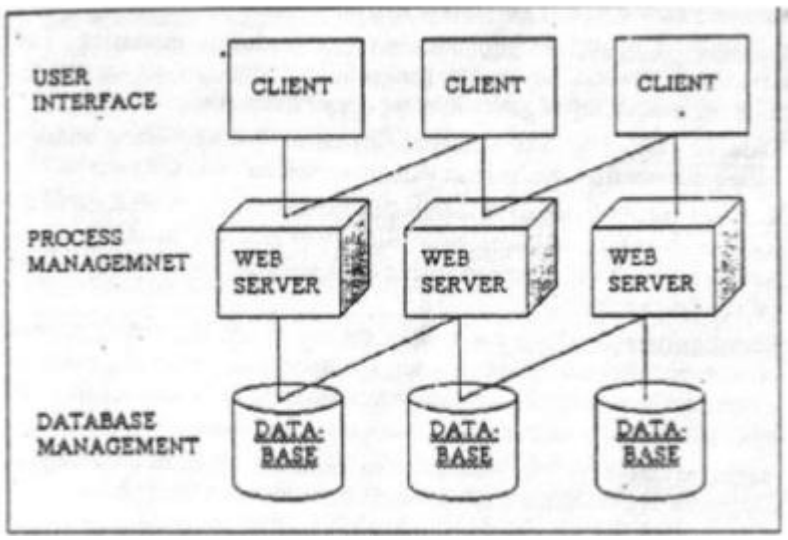
The three-tier architecture includes three tiers: top tier, middle tier and third tier.

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

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

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

The following Figure shows the outline of the e commerce system Three - tier architecture diagram.



E commerce Architecture Three Tier architecture

The client server architecture advantages:

- The client-server architecture provides standardized, abstract interfaces to establish communication between multiple modules. When these modules are combined, they become an integrated business application. Each module is a shareable and reusable object that can be included in another business application.
- In the client-server architecture, the functions of a business application are isolated within the smaller business application objects and so application logic can be modified easily.
- In the client-server architecture, each business application object works with its own encapsulated data structures that correspond to a specific database. When business application objects communicate, they send the data parameters as specified in the abstract interface rather than the entire database records.
- This reduces the network traffic. In the client-server architecture, a programmer can develop presentation components without knowing the business application logic.
- This architecture also helps a database analyst in accessing the data from the database without being concerned how the data is presented to an end user.

Architectural Framework of E Commerce

The software framework necessary for building electronic commerce applications is littleunderstood in existing literature. In general a framework is intended to define and create toolsthat integrate the information found in today's closed systems andallows the development ofe-commerce applications. It is important to understand that the aim of the architectural frame-work itself is not to build new database management systems, data repository, computerlanguages, software agent based transaction monitors, or communication protocols. Rather,the architecture should focus on synthesizing the diverse resources already in place incorporations to facilitate the integration of data and software for better applications. Theelectronic commerce application architecture consists of six layers of functionality, orservices

1. Applications;
2. Brokerage services, data or transaction management;
3. Interface, and; support layers
4. Secure messaging, security and electronic document Interchange;
5. Middle ware and structured document interchange; and
6. Network infrastructure and basic communications services

Application services	Customer- to- business Business- to- business Intra-organizational
Brokerage and datamanagement	Order processing Payment advances-electronic cash Virtual mail
Interface layer	Interactive catalogues Directory support functions Software agents
Secure messaging	Encrypted e-mail, EDI Remote programming
Middle ware services	Structured documents (SCML,HTML) Compound documents
Network infrastructure	Wireless - cellular, radio, PCs Wire line - POTS, coaxial, fiber optic

These layers cooperate to provide a seamless transition betweentoday's computing resourcesand those of tomorrow by transparently integrating information access and exchange withinthe context of the chosen application. As seen in table above, electronic commerceapplications are based on several elegant technologies. But only when they are integrated dothey provide uniquely powerful solutions.

Electronic Commerce Application Services

Three distinct classes of electronic commerce application can be distinguished: customer to business, business-to-business, and intra organization.

Consumer-to-Business Transactions

This category is also known as**marketplace transaction**. In a marketplace transaction,customers learn about products differently through electronic publishing, buy themdifferently using electronic cash and secure payment systems, and have them delivereddifferently. Also, how customers allocate their loyalty may also be different. In light of this,the organization itself has to adapt to a world where the traditional concepts of branddifferentiation no longer hold-where"quality" has a new meaning, where "content" may not beequated to "product," where "distribution" may not automatically mean "physicaltransport." In this new environment, brand equity can rapidly evaporate forcing firms todevelop new ways of doing business.

Business-to Business Transactions

This category is known as**market-link transaction**. Here, businesses, governments, andother organizations depend on computer–to-computer communication as a fast, aneconomical, and a dependable way to conduct businesstransactions. Small companiesarealso beginning to see the benefits of adopting the same methods. Business-to-businesstransactions 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. The current accounts payable process occurs through the exchange of paperdocuments. Each year the trading partners exchange millions of invoices, checks, purchaseorders, financial reports, and other transactions. Most of the documents are in

electronic format their point of origin but are printed and key-entered at the point of receipt. The currentmanual process of printing, mailing is costly, time consuming, and error-prone. Given thissituation and faced with the need to reduce costs, small businesses are looking towardelectronic commerce as a possible savior.

Intra-organizational Transactions

This category is known as **market-driven** transactions. A company becomes market driven bydispersing throughout the firm information about its customers and competitors; by spreadingstrategic and tactical decision making so that all units can participate; and by continuouslymonitoring their customer commitment by making improved customer satisfaction anongoing objective. To maintain the relationships that are critical to delivering superiorcustomer value, management must pay close attention to service, both before and after sales.In essence, a market-driven business develops a comprehensive understanding of itscustomers'business and how customers in the immediate and downstream markets perceivevalue.

Three major components of market-driven transactions are·

- Customer orientation through product and service·
- Customization; cross-functional coordination through enterprise·
- Integration; and advertising, marketing, and customer service

Information Brokerage and Management

The information brokerage and management layer provides service integration through thenotion of information brokerages, the development of which is necessitated by the increasinginformation resource fragmentation. The notion of information brokerage is used to representan intermediary who provides service integration between customers and information providers, given some constraint such as a low price, fast service, or profit maximization for aclient. Information brokers, for example, are rapidly becoming necessary in dealing with thevoluminous amounts of information on the networks. As on-line databases migrate to consumer information utilities; consumers and information professionals will have to keep up with the knowledge and owner-ship/of all thesesystems. Who's got what? How doyou useit? What do they charge? Most professionals have enough

trouble keeping track of files of 1interest on one or two database services. With all the complexity associated with largenumbers of on-line databases and service bureaus, if it is impossible to expect humans to dothe searching. It will have to be software programs information brokers or software agents, touse the more popular term-that act on the searcher's behalf.

Information brokerage does morethan just searching. It addresses the issue of adding value to the information that is retrieved.For instance, in foreign exchange trading, information is retrieved about the latest currencyexchange rates in order to hedge currency holdings to minimize risk and maximize profit.With multiple transactions being the norm in the real world, service integration becomescritical. Taking the same foreign exchange, further, service integration allows one to link thehedging program (offered on a time-sharing basis by a third party) with the search program(could be another vendor) that finds the currency rates from the cheapest on-line service toautomatically send trades to the bank or financial services company. In effect, a personalizedautomated trading system can be created without having to go to any financial institution.This is just one example of how information brokerages can add value. Another aspect of the brokerage function is the support for data management and traditional transaction services.Brokerages may provide tools to accomplish more sophisticated, time-delayed updates orfuture compensating transactions. These tools include software agents, distributed querygenerator, the distributed transaction generator, and the declarative resource constraint Basewhich describes a business's rules andenvironment information. At the heart of this layer liesthe work-flow scripting environment built on a software agent model that coordinates workand data flow among support services. Software agents are used to implement information brokerages. Software agents are mobile programsthat have been called "healthy viruses,""digital butlers/" and "intelligent agents." Agents are encapsulations of users' instructionthat perform all kinds of tasks in electronic marketplaces spread across networks. Information brokerages dispatch agents capable of information resource gathering, negotiating deals, and performing transactions. The agents are intelligent because they have contingency plans ofaction. They examine themselves and their environment and if necessary change from theiroriginal course

of action to an alternative plan. For example, suppose you send an agent to anon-line store with a request to order a bouquet of roses for Rs.25/- or less. If the shop offers roses starting at Rs.30/-, your agent can either choose a different bouquet or find a differentstore by consulting an on-line "Yellow Pages" directory, depending on prior instructions.

Interface and Support Services

The third layer, interface and support services will provide interfaces for electroniccommerce applications such as interactive catalogues and will sup-port directory services-functions necessary for information search and access. These two concepts are very different.Interactive catalogs are the customized interface to consumer applications such as homeshopping. An interactive catalog is an extension of the paper-based catalog and incorporatesadditional features such as sophisticated graphics and video to make the advertising moreattractive. Directories, on the other hand, operate behind the scenes and attempt to organizethe enormous amount of information and transactions generated to facilitate electroniccommerce. Directory services databases make data from any server appear as a local file. Inthe case of electronic commerce, directories would play an important role in informationmanagement functions.The primary difference between the two is that unlike interactive catalogs, which deal with people, directory support services interact directly with soft-ware applications. For thisreason, they need not have the multimedia glitter and jazz generally associated withinteractive catalogs. From a computing perspective, we can expect that there will be no onecommon user interface that will glaze the surface of all electronic commerce applications, butgraphics and object manipulation will definitely predominate. Tool developers anddesigners might incorporate common tools for interface building, but the shape of catalogs ordirectories will depend onthe users' desires and functional requirements.

Secure Messaging and Structured Document Interchange Services

Electronic messaging is a critical business issue. Consider a familiar business scenario:

In**Integrated Messaging**: a group of computer services that through the use of a networksend, receive, and combine messages, faxes, and large data files. Some better-

knownexamples are electronic mail, enhanced fax, and electronic data interchange. Broadly defined,messaging is the software that sits between the network infrastructure and the clients orelectronic commerce applications, masking the peculiarities of the environment. Othersdefine messaging as a frame-work for the total implementation of portable applications,divorcing you from the architectural primitives of your system. In general, messaging products are not applications that solve problems; they are more enablers of the applicationsthat solve problems. Messaging services offer solutions for communicating non formatted (unstructured) data-letters, memos, and reports as weft as formatted (structured) data such as purchase orders, shipping notices, and invoices. Unstructured messaging consists of fax, e-mail, and form-based systems like Lotus Notes. Structured documents messaging consists ofthe automated interchange of standardized and approved messages between computerapplications, via telecommunication

Another**advantage** of messaging is that it is not associated with any particularcommunication protocol. No pre-processing is necessary, although there is an increasing needfor programs to interpret the message. Messaging is well suited for both client server and peer-to-peer computing models. In distributed systems,the messages are treated as "objects"that pass between systems. Messaging is central to work-group computing that is changingthe way businesses operate. The ability to access the right information at the right time acrossdiverse work groups is a challenge. Today, with the messaging tools, people cancommunicate and work together more effectively-no matter where they are located.

The main**disadvantages**of messaging are the new types of applications it enables-which appear to bemore complex, especially to traditional programmers and the jungle of standards it involves.Because of the lack of standards, there is often no interoperability between differentmessaging vendors leading to islands of messaging. Also, security, privacy, andconfidentiality through data encryption and authentication techniques are important issuesthat need to be resolved for ensuring the legality of the message-based transactionsthemselves.

Middleware Services

Middleware is a relatively new concept that emerged only recently.Over the years, there developed the need to solve all the interface, translation, transformation,and interpretation problems that were driving application developers crazy. With the growthof networks, client-server technology, and all other forms of communicating between/amongunlike platforms, the problems of get-ting all the pieces to work together grew fromformidable to horrendous. As the cry for distributed computing spread, users demandedinteraction between dissimilar systems, networks that permitted shared resources andapplications that could be accessed by multiple software programs. Middleware is theultimate mediator between diverse software pro-grams that enables them talk to one another.Another reason for middleware is the computing shift from application centric to data centrici.e. remote data controls all of the applications in the network instead of applicationscontrolling data.To achieve data-centric computing, middleware services focus on three elements:transparency, transaction security and management, and distributed object management andservices

Media Convergence

The development of ICT is a key factor inthe growth of e-commerce. For instance, technological advancesin digitizing content, compression and the promotion of opensystems technology have paved the way for the convergence ofcommunication services into one single platform. This in turnhas made communication more efficient, faster, easier, andmore economical as the need to set up separate networks fortelephone services, television broadcast, cable television, andInternet access is eliminated. From the standpoint of firms/businesses and consumers, having only one informationprovider means lower communications costs.

Moreover, the principle of universal access can be made moreachievable with convergence. At present the high costs ofinstalling landlines in sparsely populated rural areas is adisincentive to telecommunications companies to installtelephones in these areas. Installing landlines in rural areas canbecome more attractive to the private sector if revenues fromthese landlines are not limited to local and long distancetelephone charges, but also include cable TV and Internetcharges. This development will ensure affordable access

toinformation even by those in rural areas and will spare thegovernment the trouble and cost of installing expensivelandlines

E-Commerce Business Applications

Now-a-days nearly every company and organization makes use of the Internet to perform business deals and transactions, let us take a look at this a little more closely.

Electronic Commerce, that is business done online or electronically with the use of Internet or any other computer networking system is applied into the four main section of business given below:

- e-Commerce applications in the Manufacturing Sector
- e-Commerce applications in the Wholesale Sector
- e-Commerce applications in the Retail Sector
- e-Commerce applications in the Service Sector

E-Commerce applications in Manufacturing

Manufacturing can be defined as the process of collecting and then converting raw materials into finished, qualitative goods or products for the consumers. It requires a web of various components, contracts personnel etc working intricately together and in synch in order to produce goods or services. It requires components, assemblies, transportation, storages, paper works, etc.

E-Commerce applied to the supply chain management process helps in reducing the overall costs drastically and improves quality and efficiency by automating most of the supply chain.

E-Commerce application in Wholesale

Selling goods or products in large quantities to anyone other than the consumers, take for example the retailers, industrial/ commercial or other business users or even distributors are known as wholesalers. Physical assembling, sorting & grading goods in large lots, breaking bulk, repacking & redistributing in smaller lots is all a part wholesale.

Problems faced by the traditional system of wholesale:

The local wholesalers could not compete with the foreign wholesale enterprises who had acquired highly advanced management and operational skills overdue time.The wholesale sector was characterized for its high input and low output. Wholesale operating costs which included staffing, setting up and acquiring land for local warehouses, establishing distribution centers,etc were extremely high.

Role of E-Commerce in wholesale:

- Reduced operating costs, access to accurate and correct information on time & quick responses helps in qualitative and efficient decision making.
- Ability of doing global marketing in less time and cheaper
- Gaining and catching up to the competitive edge held by foreign wholesalers such as MNC's
- Offers a wide and extensive range of information, intermediary and business services..

E-Commerce application in Retail

Selling of goods and services to the consumers for their personal consumption and use is known as **retailing.**

Take for example... Ebay.com, departmental stores, services like dentists, doctors, hotels, etc., Retailers provide a link between the consumers and the manufacturers and add value to the product and service by making their sales easier. Retailers answer any queries that you may have; they display and demonstrate products to the consumers before selling it to them. This makes the services by retailers less risky and more fun to buy products. They even provide extra services from personal shopping to gift wrapping and home delivery!!

Role of E-Commerce in Retailing:

The Internet has made retailing an exciting and challenging field in recent days with various companies hosting their stores online via the internet.

People can now sit at their computers, open the website they desire to do so and browse the catalogues put up by the company (retailer), choose their product and either pay for it online itself or on delivery. You don't need to step outat your room to make a purchase nowadays.

Having your store online helps drastically in cost cutting as companies don't need to purchase stores, they can cut down on staff, provide services to a much wider audience, etc

E-Commerce application in the Service sector

One of the three main industrial categories of a developed economy is the service sector. It involves basically the provision of all services such as distribution and sales of goods to other businesses and consumers such as pest control, entertainment and even services such as transportation.It also includes the public utilities and the soft parts of the economy such as insurance, banking, education, insurance, etc.The service sector focuses mainly on people to people services.

Issues faced by the service sector:

Since services are intangible, it's extremely difficult to make customer understand and aware about their benefits. Quality of services depends solely on the quality of the individual providing the services. There's no special technology or anything like in manufacturing to attract people.

Role of E-Commerce in the Service Sector:

E-Commerce helps in improving and increasing the speed of transactions, reduces management expenditure, and increases efficiency. It helps the insurance, banking and mainly all the financial sectors, real estate, telecommunications, tourism, logistics, and postal services. E-Commerce also helps services gain a competitive advantage by providing strategies for differentiation, cost leadership and customer satisfaction.

Business Models of E-Commerce

In E-commerce, business models are models that define the way in which business is' done over the Internet. Creating and deploying an E-commerce Website is a prerequisite for creating any E-commerce solution. Identification of the business model is first step in the development of an E-commerce Website.

Business models in E-commerce can be categorized into the following four types, depending on the type of parties involved in transaction:

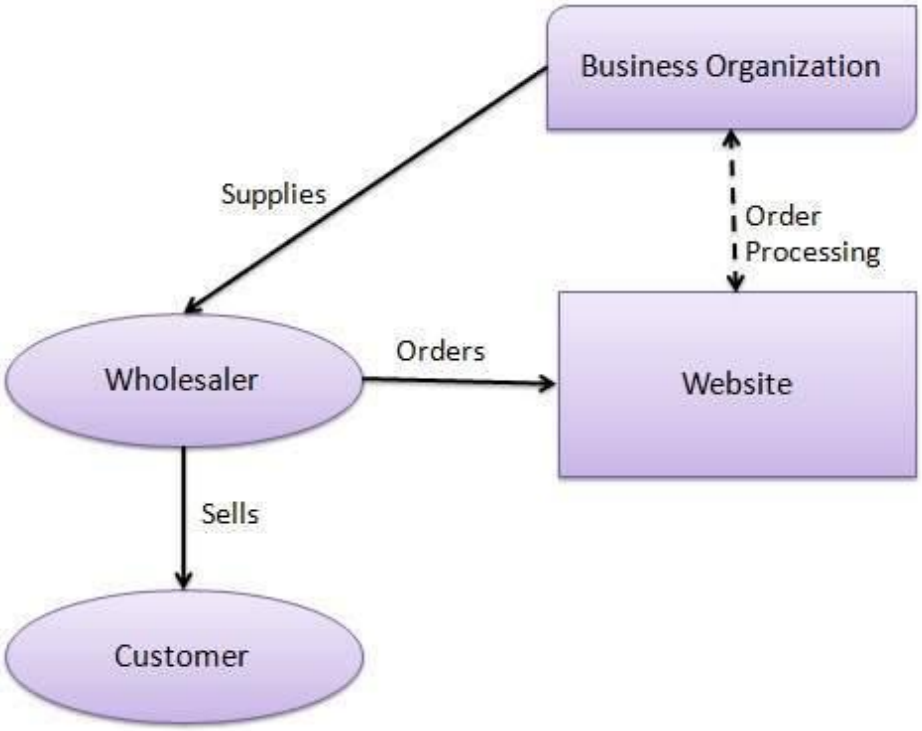
E-Commerce or Electronics Commerce business models can generally categorized in following categories.

- Business - to - Business (B2B)
- Business - to - Consumer (B2C)
- Consumer - to - Consumer (C2C)
- Consumer - to - Business (C2B)
- Business - to - Government (B2G)
- Government - to - Business (G2B)
- Government - to - Citizen (G2C)

Business-to-Business

It is defined as E-commerce between any two companies. Business-to-Business (B2B) E-commerce, which deals with relationships among businesses that have two primary components, E-frastructure and E-market. E-frastructure is the architecture of B2B, and E-market refers to a Website where buyers and sellers interact with each other and conduct transactions. Some of the application areas of B2B are supplier management, inventory management, distribution management, channel management and payment management.

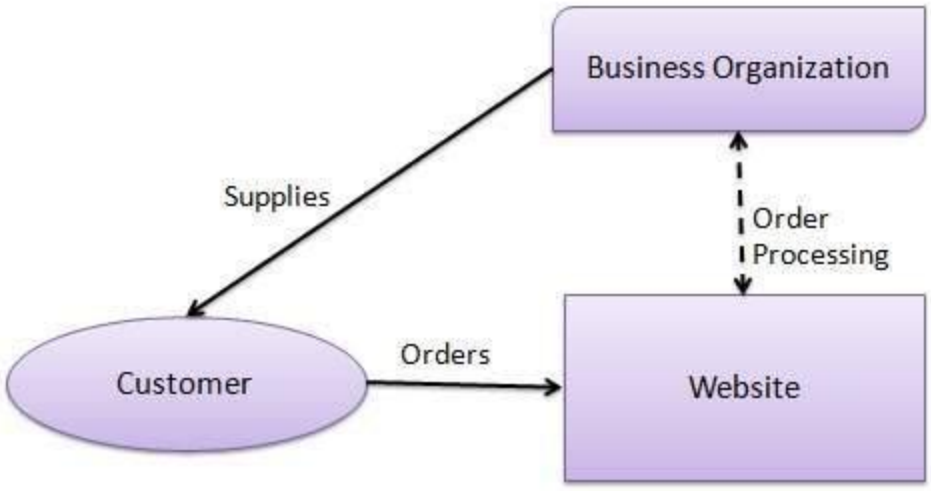
Website following B2B business model sells its product to an intermediate buyer who then sells the product to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end product to final customer who comes to buy the product at wholesaler's retail outlet.



Business-to-Consumer

It is defined as E-commerce between companies and consumers. Business-to-Customer (B2C) involves selling and buying of goods and services over the Internet from Web retailers to Web customers. With B2C E-commerce, the retailer sells the products and the services to unknown and un-trusted strangers. Therefore, extra effort must be made to capture customer and payment information. The most common application areas of this type of E-commerce are purchasing product and information and personal finance management.

In B2C model, business Website is a place where all transactions take place between a business organization and consumer directly.



In B2C Model, a consumer goes to the website, selects a catalog, orders the catalog and an email is sent to business organization. After receiving the order, goods will be dispatched to the customer. Following are the key features of a B2C Model

- Heavy advertisingsare required to attract large number of customers.
- High investment in terms of hardware/software.
- Support or good customer care service

Consumer Shopping Procedure

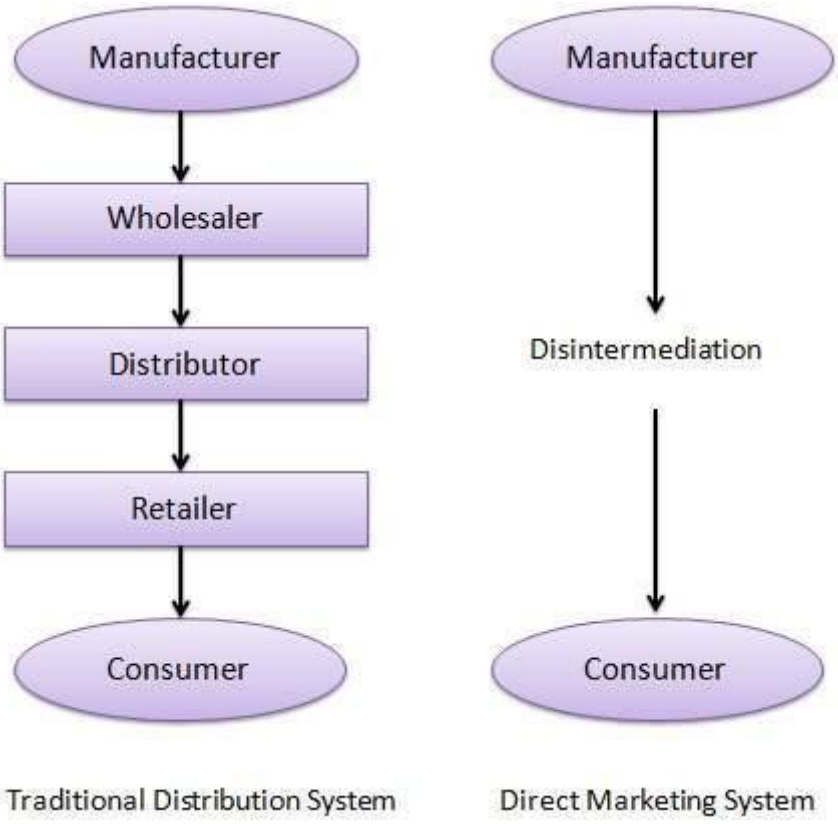
Following are the steps used in B2C e-commerce −

A consumer must

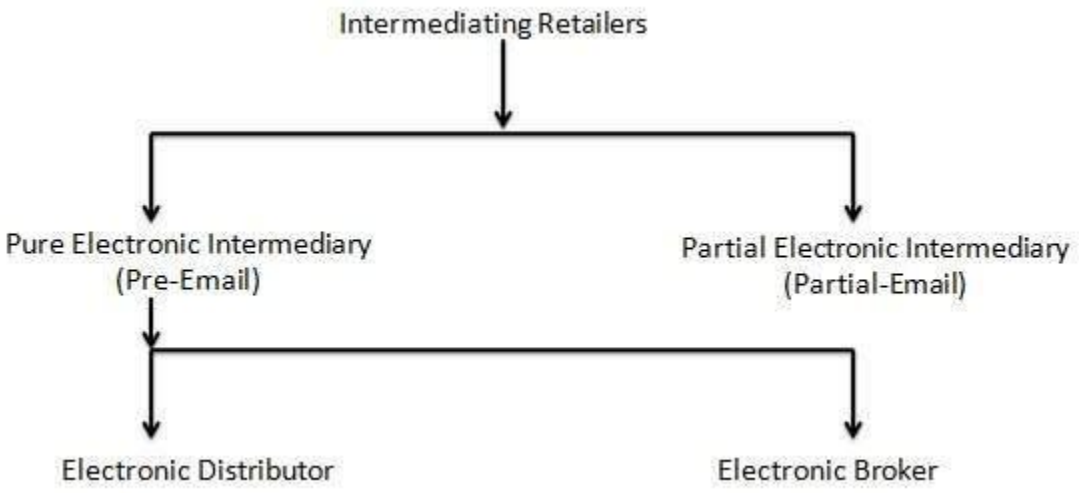
- Determine the requirement.
- Search available items on the website meeting the requirement.
- Compares similar items for price, delivery date or any other terms.
- Gives the order.
- Pays the bill.
- Receives the delivered item and review/inspect them.
- Consults the vendor to get after service support or returns the product if not satisfied with the delivered product.

Disintermediation and Reinter-mediation

In traditional commerce, there are intermediating agents like wholesalers, distributors, retailers between manufacturer and consumer. In B2C website, manufacturer can sell products directly to consumers. This process of removal of business layers responsible for intermediary functions is called Disintermediation.



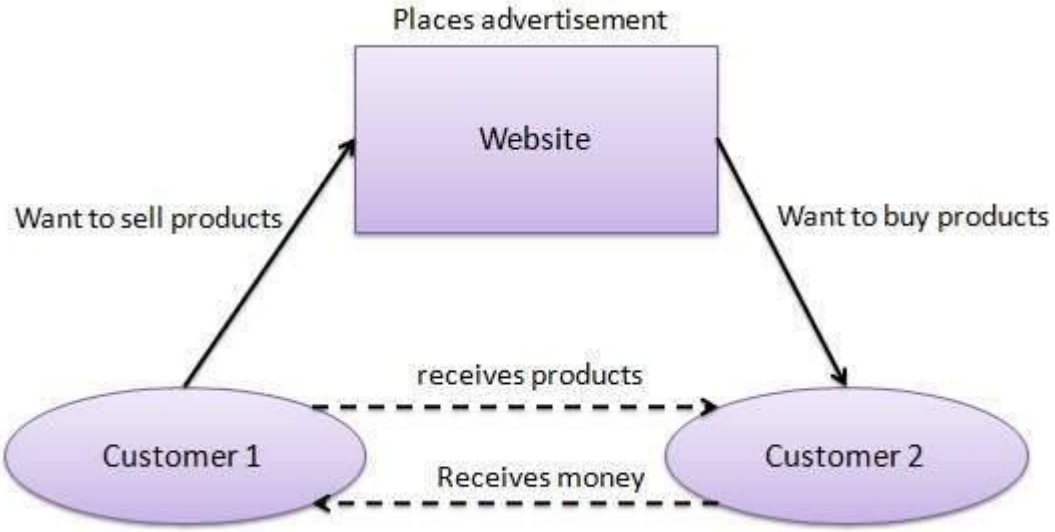
Now-a-days, a new electronic intermediary breed is emerging like e-mall and product selection agents. This process of shifting of business layers responsible for intermediary functions from traditional to electronic mediums is called Reinter-mediation.



Consumer-to-Consumer:

It is defined as E-commerce between consumers. Customer-to-Customer (C2C) E-commerce is characterized by the growth of the E-marketplace and on-line auctions, particularly in industries where business firms can bid for what they want from multiple suppliers.

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



Business-to-Government:

It is defined as E-commerce between companies and the public sector. Business-to-Government (B2G) E-commerce refers to the use of the Internet for public procurement, licensing procedures and the other government-related operations. Internet-based purchasing policies increase the transparency of the procurement process and reduce the risk of irregularities.

Consumer - to - Business (C2B)

In this model, a consumer approaches website showing multiple business organizations for a particular service. Consumer places an estimate of amount he/she wants to spend for a particular service. For example, comparison of interest rates of personal loan/ car loan provided by various banks via website. Business organization who fulfills the consumer's requirement within specified budget approaches the customer and provides its services.

Basics of Internet and Networking

Networking is the practice of linking multiple computing devices together in order to share resources. These resources can be printers, CDs, files, or even electronic communications such as e-mails and instant messages. These networks can be created using several different methods, such as cables, telephone lines, satellites, radio waves, and infrared beams. Without the ability to network, businesses, government agencies, and schools would

be unable to operate as efficiently as they do today. The ability for an office or school to connect dozens of computers to a single printer is a seemingly simple, yet extremely useful capability. Perhaps even more valuable is the ability to access the same data files from various computers throughout a building. This is incredibly useful for companies that may have files that require access by multiple employees daily. By utilizing networking, those same files could be made available to several employees on separate computers simultaneously, improving efficiency.

The Ins and Outs of Networking

When it comes to networking, there are two essential pieces of equipment that enable numerous devices to be connected. They are

- Switches and
- Routers

Switches

Switches are used in order to connect many devices on the same network. These devices are generally within the same building, such as an office building or school and could consist of various computers, printers, and other gadgets. The switch acts as a controller, allowing the connected objects to share information with one another. This not only increases productivity and efficiency, but also saves money.

Routers

In addition to switches, networks generally employ routers as well. These essential tools connect different networks to each other through the internet in order to allow for data exchange between networks. Whereas the switch can be considered a controller, a router should be considered more of a dispatcher, packaging digital information and choosing the best route for it to travel. Routers can feature several other functions, including firewalls and virtual private networks (VPNs) that enhance the security of the data being sent over the internet.

Network Types

There are countless types of networks available, especially as networking technologies continue to advance. Two of the most commonly employed networks are LAN and WAN.

Local Area Network (LAN): These networks are used to connect devices over relatively short distances, such as within a building, school, or home. LANs generally employ Ethernet cables as a means of connecting the various gadgets within the network.

Wide Area Network (WAN): These networks are used to connect devices over much larger distances than LANs. A WAN is established by using routers to connect various LANs and is generally not owned by a single person or organization. The internet is one massive WAN that spans the entire planet.

Other Network Types: Various other types of networks exist, including **Wireless Local Area Networks (WLANs)** that are LANs based on wireless network technology and M**etropolitanArea Networks (MANs)** that cover larger areas than LANs but smaller areas than WANs. These MANs generally span a city and are owned and operated by a government or corporation.

Network Topology

Not to be confused with network type, network topology refers to the virtual layout of the devices within a network and can refer to five distinct categories:

Bus: This topology utilizes a common backbone, generally a single cable, to connect all the devices on a network.

Ring: Found in some offices and schools, ring topologies give each device two neighbours for communication purposes. All data travels in a ring, and a failure of that ring can bring down the whole network.

Star: Found in many homes, a central connection known as a "hub" is connected to all the objects on the network. This hub could be a router or a switch.

Tree: A hybrid bus/star network, several star hubs are connected to the core cable of a bus in order to vastly increase the number of computers able to connect to the network.

Mesh: The mesh topology employs the concept of routing, in which each piece of data sent on the network has multiple paths it can take instead of one fixed route. The internet is a perfect example of this topology.

The Art of Computer Networking

Computer networking has become a central theme in nearly every aspect of life. From home use to business use, more and more devices are being produced that can access computer networks. Because of this fact, it is important to understand just what computer networking is.

Computer Network Definition

A computer network is a collection of computers and other devices that are able to communicate with each other and share data. These devices include computers, printers, tablets, phones, and many other electronics.

Computer Networking Essentials

Both traditional and modern forms of computer networking aim to provide users with the ability to share data amongst multiple gadgets, whether they are in the same building or across the globe. Traditional computer networking relied on Ethernet and fiber optic cables to connect various devices on a network. More modern technology has emerged that allows for wireless connections between electronics. These technologies include Wi-Fi and Bluetooth compatible devices. It is very helpful to understand the role that each of these technologies plays in computer networking.

Wide Area Interconnects: Networks that must support large volumes of devices simultaneously, such as satellites or cellular networks are considered wide area interconnects. They are generally expensive to build and run more slowly than others due to the large area and high volume of users.

LongDistance Interconnects: These include cables such as Ethernet and Fiber optics. They support a very large amount of data and serve many clients who share common hardware.

Short Distance Interconnects: These technologies are much newer than other the others and include tools such as Bluetooth. These interconnects are highly optimized for low-cost and also low power usage. Bluetooth is used in many mobile devices, laptop computers, and speakers in order to enable the transfer of data. Popular information sent over Bluetooth includes music, phone calls, and contact information. The market for Bluetooth technology is growing at a rapid pace to include many other items such as remote controlled helicopters and cars, home security systems, and fitness gear. Because it is rather affordable for the connectivity it supplies, Bluetooth technology is finding its way into countless niches.

Types of Internet Connections

Broadband: Broadband internet connections provide high-speed internet that is always on and allows for more data to be transmitted than the traditional dial-up connections. Unlike dial-up services, it does not block phone lines and you do not have to reconnect to the network each time you log off. There are various types of broadband technologies, including digital subscriber line (DSL), cable modems, fibers, wireless broadband connections, and Satellite connections. The fastest of these connections is by far the fiber broadband, outperforming DSL and cable modems by ten to even hundreds of Mbps. Wireless connections perform at a speed similar to DSL and cable modems, while satellites are slower than DSL, but still much faster than traditional dial-up internet.

Wi-Fi: Wi-Fi is a play on the term Hi-Fi and represents a wireless internet connection. More specifically, it is a wireless local area network (WLAN) that allows devices to connect wirelessly to the internet. It utilizes 2.4 GHz and 5.0 GHz radio waves to connect Wi-Fi enabled gadgets (computers, gaming systems, mobile phones, and even some cameras) to the internet without the need for cumbersome wires. These connections can be extremely fast in some cases, reaching speeds of over 100 Mbps, but the convenience of having no cables and the increased speed come at a cost of potentially decreased security. Because there is no need for a physical connection, it is easier for hackers to compromise the security of Wi-Fi connections.

WiMAX: WiMAX is a more advanced form of wireless internet technology than Wi-Fi. It aims to provide the high speeds of broadband connections, the large coverage of phone

networks, and the convenience of Wi-Fi into one package. The implementation of WiMAX would allow DSL and cable modem users to ditch their wired internet connections in favour of a high-speed, wireless alternative. Even those users in rural areas who find wireless internet or even phone coverage difficult to come by would be able to connect to the internet via WiMAX due to its very broad coverage. If WiMAX is mastered, the way that people access the internet worldwide would be revolutionized.

Computer Networking:

Server based Network: In information technology, a server is considered any instance of an application that can receive and serve the requests of other programs. Usually these applications are run on computers dedicated to acting solely as servers so that the heavy burden of fulfilling requests from other devices on the network does not overwhelm the computers. Running servers on dedicated computers is also a safety measure, helping to keep the server from being attacked. The computers dedicated to acting as servers usually include faster CPUs, bigger hard drives, better RAM, and multiple power sources. These enhancements allow the server to handle the immense workload and also give it reliability in the event of unfortunate events.

Peer-to-Peer Networks: A Peer-to-Peer network, or P2P network, is one in which multiple computers are connected without linking through a separate computer that acts as a server. These connections can vary based on how many computers are being linked together. Two computers can be linked via a USB drive to allow for the transfer of files. Multiple computers in an office can be connected directly to each other via traditional copper wiring instead of through a server computer. The fundamental basis for P2P networks is that individual permissions must be set for each computer on the network. For instance, if one computer (A) is connected to a printer and another computer (B) on the network wishes to use the printer, then A would first have to grant B permission.

Internet

The Internet is a worldwide telecommunications system that provides connectivity for millions of other, smaller networks; therefore, the Internet is often referred to as a

network of networks. It allows computer users to communicate with each other across distance and computer platforms.

The Internet began in 1969 as the U.S. Department of Defense's Advanced Research Project Agency (ARPA) to provide immediate communication within the Department in case of war. Computers were then installed at U.S. universities with defense related projects. As research scholar began to go online, this network changed from military use to scientific use. As ARPAnet grew, administration of the system became distributed to a number of organizations, including the National Science Foundation (NSF). This shift of responsibility began the transformation of the science oriented ARPAnet into the commercially minded and funded Internet used by millions today.

The Internet acts as a pipeline to transport electronic messages from one network to another network. At the heart of most networks is a server, a fast computer with large amounts of memory and storage space. The server controls the communication of information between the devices attached to a network, such as computers, printers, or other servers.

An Internet Service Provider (ISP) allows the user access to the Internet through their server. Many teachers use a connection through a local university as their ISP. Other ISPs, such as America Online, telephone companies, or cable companies provide Internet access for their members.

Users can connect to the Internet through telephone lines, cable modems, cellphones and other mobile devices.

World Wide Web

The Internet is often confused with the World Wide Web. The misperception is that these two terms are synonymous. The Internet is the collection of the many different systems and protocols. The World Wide Web, developed in 1989, is actually one of those different protocols. As the name implies, it allows resources to be linked with great ease in an almost seamless fashion.

The World Wide Web contains a vast collection of linked multimedia pages that is ever-changing. However, there are several basic components of the Web that allow users to communicate with each other. Below you will find selected components and their descriptions.

TCP/IP protocols

In order for a computer to communicate on the Internet, a set of rules or protocols computers must follow to exchange messages was developed. The two most important protocols allowing computers to transmit data on the Internet are **Transmission Control Protocol (TCP) and Internet Protocol (IP)**. With these protocols, virtually all computers can communicate with each other. For instance, if a user is running Windows on a PC, he or she can communicate with iPhones.

Domain name system

An Internet address has four fields with numbers that are separated by periods or dots. This type of address is known as an IP address. Rather than have the user remember long strings of numbers, the Domain Name System (DNS) was developed to translate the numerical addresses into words. For example, the address icit.usf.edu is really 131.247.120.10.

URLs

Addresses for web sites are called URLs (Uniform Resource Locators). Most of them begin with **http** (HyperText Transfer Protocol), followed by a colon and two slashes. For example, the URL for the Indian Center for Instructional Technology is https://icit.usf.edu/ .

Some of the URL addresses include a directory path and a file name. Consequently, the addresses can become quite long. For example, the URL of a web page may be: https://icit.usf.edu/holocaust/default.htm. In this example, "default.htm" is the name of the file which is in a directory named "holocaust" on the ICIT server at the University.

Top-level domain

Each part of a domain name contains certain information. The first field is the host name, identifying a single computer or organization. The last field is the top-level domain, describing the type of organization and occasionally country of origin associated with the address.

Top-level domain names include:

.com	Commercial
.edu	Educational
.gov	US Government
.int	Organization
.mil	US Military
.net	Networking Providers
.org	Non-profit Organization

Domain name country codes include, but are not limited to:

.au	Australia
.de	Germany
.fr	France
.nl	Netherlands
.uk	United Kingdom
.us	United States

Paying attention to the top level domain may give you a clue as to the accuracy of the information you find. For example, information on a "com" site can prove useful, but one should always be aware that the intent of the site may be to sell a particular product or service. Likewise, the quality of information you find on the "edu" domain may vary.

Although many pages in that domain were created by the educational institutions themselves, some "edu" pages may be the private opinions of faculty and students. A common convention at many institutions is to indicate a faculty or student page with a ~ (tilde) in the address. For instance, https://icit.usf.edu/~kemker/default.htm is a student's personal web page.

Browser

Once you have an account with an Internet service provider, you can access the Web through a browser, such as Safari or Microsoft Internet Explorer. The browser is the application responsible for allowing a user's computer to read and display web documents.

Hypertext Markup Language (HTML) is the language used to write web pages. A browser takes the HTML and translates it into the content that seen on the screen. You will note your cursor turns into a pointing finger over some images or text on the page. This indicates a link to additional information and it can be either a link to additional web pages, email, newsgroups, audio, video, or any number of other exciting files.

For example, if you were to click on MS Department of Education your browser would link to the MS Department of Education home page and that web page would open in your screen.

Navigating on the Web

Browser is equipped with many useful features to assist you in navigating through the Web. Some of these features are:

Menu bar: The menu bar, located at the very top of the screen, can be accessed using the mouse. When you hold down the mouse button over an item in the main menu, a sub menu is "pulled down" that has a variety of options. Actions that are in black can be performed, while actions that cannot be performed will be in gray or lightened. The submenus provide keyboard shortcuts for many common actions, allowing you to implement the functions faster than using the mouse.

Tool bar: The tool bar is located at the top of the browser; it contains navigational buttons for the Web. Basic functions of these buttons include:

Command	Function
Home	Opens or returns to starting page
Back	Takes you to the previous page
Forward	Takes you to the next page
Print	Prints current page
Stop	Stops loading a page
Reload	Refresh/redisplays current page
Search	Accesses search engine

Location bar: The location bar, below the tool bar, is a box labeled "Location," "GoTo," or "Address." You can type in a site's address, and press the Return or Enter key to open the site.

Status bar: The status bar is located at the very bottom of the browser window. You can watch the progress of a web page download to determine if the host computer has been contacted and text and images are being downloaded.

Scroll bar: The scroll bar is the vertical bar located on the right of the browser window. You can scroll up and down a web page by placing the cursor on the slider control and holding down the mouse button.

Unit II

Electronic Payment Systems

An e-commerce payment system facilitates the acceptance of electronic payment for online transactions. Also known as a sample of Electronic Data Interchange (EDI), e-commerce payment systems have become increasingly popular due to the widespread use of the internet-based shopping and banking.

Overview

Definition:

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.

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

Decreasing technology cost: The technology used in the networks is decreasing day by day, which is evident from the fact that computers are now dirt-cheap and Internet is becoming free almost everywhere in the world.

Reduced operational and processing cost: Due to reduced technology cost the processing cost of various commerce activities becomes very less. A very simple reason to prove this is the fact that in electronic transactions we save both paper and time.

Increasing online commerce: The above two factors have lead many institutions to go online and many others are following them.

E-Commerce was began with EDI, primarily, for large business houses and not for the common man. Many new technologies, innovations have lead to use of E-Commerce for the common man also. Some applicationsare

Consumers: Credit cards, Debit Cards, ATMs (Automated Teller Machines), stored value cards, E-Banking.

Online commerce: Digital Cash, E-Cash, Smart cards (or Electronic Purse) and encrypted Credit cards.

Companies: The payment mechanisms that a bank provides to a company have changed drastically. The Company can now directly deposit money into its employee's bank account. These transfers are done through Automated Transfer Houses.

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 company's offices.

Lack of Eligibility: Not all potential buyers may have a bank account.

Lack of support for micro-transactions: Many transactions done through the Internet are of very low cost though they involve data flow between two entities in two countries. The same if done on paper may not be feasible at all.

Types of Electronic Payment Systems

Electronic payment systems are proliferating in banking, retail, health care, on-linemarkets, and even government—in fact, anywhere money needs to change hands.Organizations are motivated by the need to deliver products and services more costeffectively and to provide a higher quality of service to customers.The emerging electronic payment technology labeled Electronic Funds Transfer (EFT).

EFT is defined as "any transfer of funds initiated through an electronic terminal,telephonic instrument, or computer or magnetic tape so as to order, instruct, or authorizea financial institution. EFT can be segmented into three broad categories:

Banking and financial payments

– Large-scale or Wholesale payments (e.g., bank-to-bank transfer)

– Small-scale or Retail payments (e.g., automated teller machines)

– Home banking (e.g., bill payment)

Retailing payments

– Credit Cards (e.g., VISA or MasterCard)

– Private label credit/debit cards (e.g., J.C. Penney Card)

– Charge Cards (e.g., American Express)

On-Line Electronic Commerce payments

– Token-based payment systems

- Electronic cash (e.g., DigiCash)
- Electronic checks (e.g., NetCheque)
- Smart cards or debit cards (e.g., Mondex Electronic Currency Card))

– Credit card-based payments systems

- Encrypted Credit Cards (e.g., World Wide Web form-based encryption)
- Third-party authorization numbers (e.g., First Virtual)

Requirements of Electronic Payment System

Online payment processing requires coordinating the flow of transactions amonga complex network of financial institutions and processors. Fortunately, technology has simplified this process so that, with the right solution, payment processing is easy, secure, and seamless for both merchant and the customers.

Processing Basics

Purchasing online may seem to be quick and easy, but most consumers give little thought to the process that appears to work instantaneously. For it to work correctly, merchants must connect to a network of banks (both acquiring and issuing banks), processors, and other financial institutions so that paymentinformation provided by the customer can be routed securely and reliably.

The solution is a payment gateway that connects your online store to these institutions and processors. Because payment information is highly sensitive, trust and confidence are essential elements of any payment transaction. This means the gateway should be provided by a company with in-depth experience in payment processing and security.

The Payment Processing Network

Here's a breakdown of the participants and elements involved in processing payments:

Acquiring bank: In the online payment processing world, an acquiring bank provides Internet merchant accounts. A merchant must open an Internet merchant account with an acquiring bank to enable online credit card authorization and payment processing. Examples of acquiring banks include Merchant e-Solutions and most major banks.

Authorization: The process by which a customer's credit card is verified as active and that they have the credit available to make a transaction. In the online payment processing world, an authorization also verifies that the billing information the customer has provided matches up with the information on record with their credit card company.

Credit card association: A financial institution that provides credit card services that are branded and distributed by customer issuing banks. Examples include Visa® and MasterCard®

Customer: The holder of the payment instrument—such as a credit card, debit card, or electronic check.

Customer issuing bank: A financial institution that provides a customer with a credit card or other payment instrument. Examples include Citibank and Suntrust. During a purchase, the customer issuing bank verifies that the payment information submitted to the merchant is valid and that the customer has the funds or credit limit to make the proposed purchase.

Internet merchant account: A special account with an acquiring bank that allows the merchant to accept credit cards over the Internet. The merchant typically pays a processing fee for each transaction processed, also known as the discount rate. A merchant applies for

an Internet merchant account in a process similar to applying for a commercial loan. The fees charged by the acquiring bank will vary.

Merchant: Someone who owns a company that sells products or services.

Payment gateway: A service that provides connectivity among merchants, customers, and financial networks to process authorizations and payments. The service is usually operated by a third-party provider such as VeriSign.

Processor: A large data center that processes credit card transactions and settles funds to merchants. The processor is connected to a merchant's site on behalf of an acquiring bank via a payment gateway.

Settlement: The process by which transactions with authorization codes are sent to the processor for payment to the merchant. Settlement is a sort of electronic bookkeeping procedure that causes all funds from captured transactions to be routed to the merchant's acquiring bank for deposit

Digital TokenBased Electronic Payment Systems

An electronic token is a digitalanalogy of various forms of payment backed by a bank orfinancial institution.

Evaluating Various Electronic Token-based Methods

Electronic tokens are three types:

1. Cash or Real-time

- Transactions are settled with exchange of electronic currency.
- Ex: on-line currency exchange is electronic cash (e-cash).

2. Debit or Prepaid

- Users pay in advance for the privilege of getting information.
- Ex: prepaid payment mechanisms are stored in smart cards and electronic purses thatstore electronic money.

3. Credit or Postpaid

- The server authenticates the customers and verifies with the bank that funds are adequatebefore purchase.
- Ex: postpaid mechanisms are *credit/debit cards* and *electronic checks*.

Smart Cards & Electronic Payment Systems

Smart cards have been in existence since the early 1980s and hold promise for securetransactions using existing infrastructure.Smart cards are credit and debit cards and other card products enhanced withmicroprocessors capable of holding more information than the traditional magnetic stripe.The smart card technology is widely used in countries such as France, Germany, Japan,and Singapore to pay for public phone calls, transportation, and shopper loyaltyprograms.

Smart cards are basically two types:

– Relationship-Based Smart Credit Cards

– Electronic Purses, which replace money, are also known as debit cards andelectronic money.

Relationship-Based Smart Credit Cards: It is an enhancement of existing cards services and / or the addition of new servicesthat a financial institution delivers to its customers via a chip-based card or otherdevice. These services include access to multiple financial accounts, value-addedmarketing programs, or other information card holders may want to store on theircard. It includes access to multiple accounts, such as debit, credit, cash access, billpayment & multiple access options at multiple locations.

Electronic Purses: To replace cash and place a financial instrument are racing to introduce "electronicpurses", wallet-sized smart cards embedded with programmable microchips that storesums of money for people to use instead of cash for everythingThe electronic purse works in the following manner:After purse is loaded with money at an ATM, it can be used to pay for candy in a vendingmachine with a card reader.It verifies card is authentic & it has enough money, the value is deducted from balance onthe card & added to an e-cash & remaining balance is displayed by the vending machine.

Credit Card-Based Electronic Payment Systems

Payment cards are all types of plastic cards that consumers use to make purchases:

Credit cards: Such as a Visa or a MasterCard, has a preset spending limit based on theuser's credit limit.

Debit cards: Removes the amount of the charge from the cardholder's account andtransfers it to the seller's bank.

Charge cards: Such as one from American Express, carries no preset spending limit.

Advantages:

– Payment cards provide fraud protection.

– They have worldwide acceptance (nearly!).

– They are good for online transactions.

Disadvantages:

– Payment card service companies charge merchants per-transaction fees andmonthly processing fees.

Payment Acceptance and Processing

Open loop (such as VISA) and closed loop (such as American Express) systems willaccept and process payment cards.A merchant bank or acquiring bank is a bank that does business with merchants whowant to accept payment cards.Software packaged with your electronic commerce software can handle payment cardprocessing automatically.

Electronic cash is a general term that describes the attempts of several companies tocreate value storage and exchange system that operates online in much the same way thatgovernment-issued currency operates in the physical world.

Concerns about electronic payment methods include:

– Privacy
– Security
– Independence
– Portability
– Convenience

Electronic Cash Issues

• Credit card transaction fees make small purchases unprofitable
• Safeguards must be in place to prevent counterfeiting
• Must be independent and freely transferable regardless of nationality or storagemechanism

Electronic Cash Storage

• Two methods
  – On-line
    • Individual does not have possession personally of electronic cash
    • Trusted third party, e.g. e-banking, bank holds customers' cash accounts
  – Off-line
    • Customer holds cash on smart card or electronic wallet

• Fraud and double spending require tamper-proof encryption

Risks in Electronic Payment systems

- Customer's risks
  - – Stolen credentials or password
  - – Dishonest merchant
  - – Disputes over transaction
  - – Inappropriate use of transaction details
- Merchant's risk
  - – Forged or copied instruments
  - – Disputed charges
  - – Insufficient funds in customer's account
  - – Unauthorized redistribution of purchased items
- Main issue: Secure payment scheme

Electronic payments Issues

- Secure transfer across internet
- High reliability: no single failure point
- Atomic transactions
- Anonymity of buyer
- Economic and computational efficiency: allow micropayments
- Flexibility: across different methods

Electronic or Digital Cash

Electronic or digital cash combines computerized convenience with security and privacy that improve on paper cash. Theversatility of digital cash opens up a host of new markets andapplications. Digital cash attempts to replace paper cash as theprincipal payment vehicle in online payments. Although it maybe surprising to some, even after thirty years of developmentsin electronic payment systems, cash is still the most prevalentconsumer payment instrument.

Cash remains the dominantform of payment for three reasons: Lack of consumer trust in the banking system; Inefficient clearing and settlement of noncash transactionsnegative real interest rates on bankdeposits.These reasons behind the prevalent use of cash in businesstransactions indicate the need to re-engineer purchasingprocesses. In order to displace cash, electronic payment systemsneed to have some cash-like qualities that current credit anddebit cards lack. For example, cash is negotiable, meaning thatit can be given or traded to someone else. Cash is legal tender,meaning that the payee is obligated to

take it. Cash is a bearerinstrument, meaning that possession is proof of ownership.Cash can be held and used by anyone, even those without abank account. Finally, cash places no risk on the part of theacceptor; the medium is always good.

In comparison to cash, debit and credit cards have a number oflimitations. First, credit and debit cards cannot be given away because, technically, they are identification cards owned by theissuer and restricted to one user. Credit and debit cards are notlegal tender, given that merchants 'have the right to refuse toaccept them. Nor is credit and debit cards bearer instruments;their usage requires an account relationship and authorizationsystem. Similarly, checks require either personal knowledge ofthe payer, or a check guarantee system. A really novel electronicpayment method needs to do more than recreate the conveniencethat is offered by credit and debit cards; it needs to createa form of digital cash that has some of the properties of cash.

Properties of Electronic Cash

• There are many ways that exist for implementing an e-cash system; all must incorporate afew common features.

• Specifically, e-cash must have the following four properties:

Monetary value - Must have a monetary value: It must be backed by cash (currency), bank authorized credit or a bank certified cashier's check.

Interoperability - Must be interoperable or exchangeable as payment for other digital cash, paper cash, goods or services, lines of credit, bank notes or obligations, electronic benefit transfers and the like.

Storable and Retrievable - Must be storable and retrievable:Cash could be stored on a remote computer's memory, in smart cards, or on other easily transported standard or special purpose devices. Remote storage or retrieval would allow users to exchange digital cash from home or office or while traveling.

Security - Should not be easy to copy or tamper with while it is being exchanged. This is achieved by using the following technologies; these are nothing but new and very efficient versions of the old art of cryptography.

- Digital cash is based on cryptographic systems called "**Digital Signatures**" similar to the signatures used by banks on paper cheques to authenticate a customer.

Purchasing E-cash from Currency Servers

The purchase of e-cash from an on-line currency server (or bank) involves two steps:

Establishment of an account

In this step we are given a unique digital number which also becomes our digital signature. As it is a number known only to the customer and the bank, forgery, which may be done in paper cheques becomes very difficult.

Maintenance of sufficient money in the account is required to back any purchase.

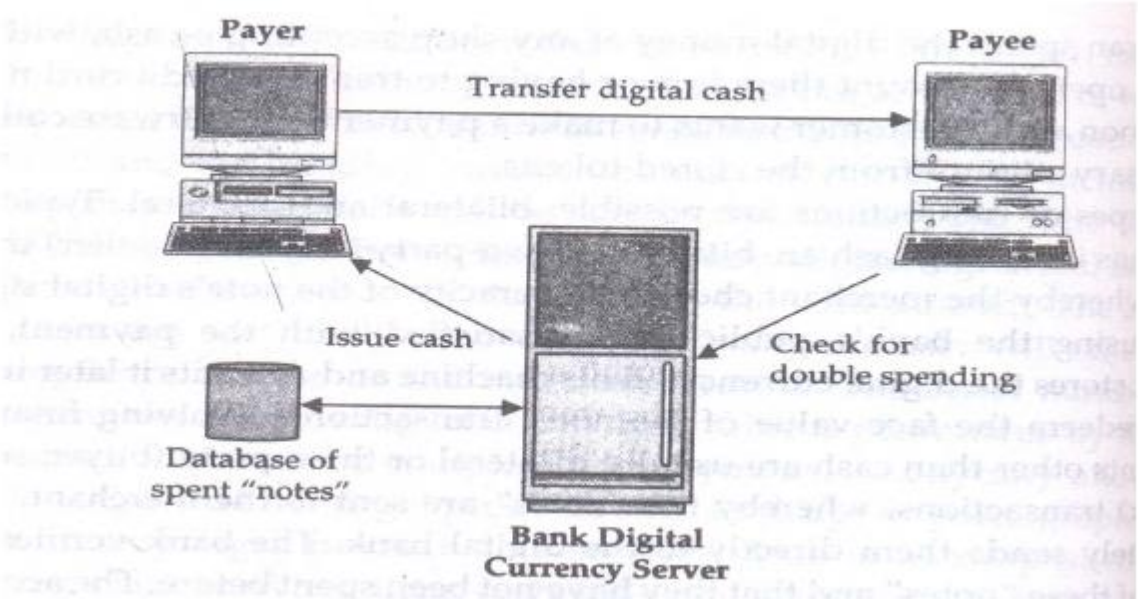
Some customers might prefer to purchase e-cash with paper currency, either to maintainanonymity or because they don't have a bank account.

Using the Digital Currency

• Once the tokens are purchased, the e-cash software on the customer's PC stores digitalmoney undersigned by a bank.

• The users can spend the digital money at any shop accepting e-cash, without having toopen an account there or having to transmit credit card numbers.

• As soon as the customer wants to make a payment, the software collects the necessaryamount from the stored tokens.



Electronic Cheque

It is another form of electronic tokens.

• In the given model shown in fig, buyers must register with third-party account serverbefore they are able to write electronic checks.

• The account server acts as a billing service.

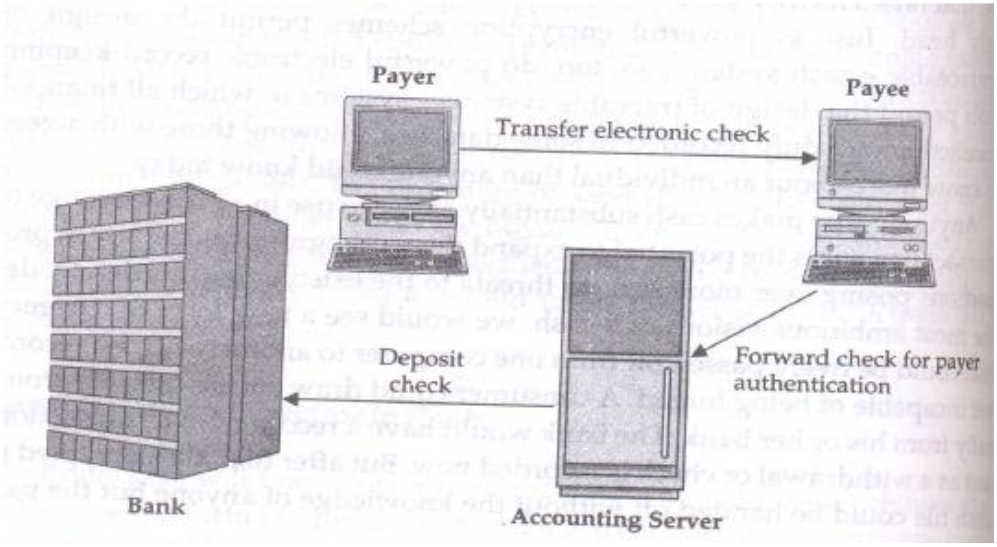


Fig. Payment Transaction Sequence in an electronic Cheque system

The advantages are:

1. They work in the same way as traditional cheques.
2. These are suited for clearing micropayments
3. They create float & availability of float is an important for commerce
4. Financial risk is assumed by the accounting server & may result in easier acceptance

Financial Instruments

Financial instruments are monetary contracts between parties. They can be created, traded, modified and settled. They can be cash (currency), evidence of an ownership interest in an entity (share), or a contractual right to receive or deliver cash (bond).

International Accounting Standards IAS 32 and 39 define a financial instrument as "any contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity".

Types

Financial instruments can be either cash instruments or derivative instruments:

- **Cash instruments** —instruments whose value is determined directly by the markets. They can be securities, which are readily transferable, and instruments such as loans and deposits, where both borrower and lender have to agree on a transfer.
- **Derivative instruments** —instruments which derive their value from the value and characteristics of one or more underlying entities such as an asset, index, or interest rate. They can be exchange-traded derivatives and over-the-counter (OTC) derivatives.

Alternatively, financial instruments may be categorized by "asset class" depending on whether they are equity-based (reflecting ownership of the issuing entity) or debt-based (reflecting a loan the investor has made to the issuing entity). If the instrument is debt, it can be further categorized into short-term (less than one year) or long-term. Foreign exchange instruments and transactions are neither debt- nor equity-based and belong in their own category.

Asset class	**Instrument type**			
	Securities	**Other cash**	**Exchange-traded derivatives**	**OTC derivatives**
Debt (long term) > 1 year	Bonds	Loans	Bond futures Options on bond futures	Interest rate swaps Interest rate caps and floors Interest rate options Exotic derivatives
Debt (short term) ≤ 1 year	Bills, e.g. T-bills Commercial paper	Deposits Certificates of deposit	Short-term interest rate futures	Forward rate agreements
Equity	Stock	N/A	Stock options Equity futures	Stock options Exotic derivatives

Equities

Equities are a type of security that represents the ownership in a company. Equities are traded (bought and sold) in stock markets. Alternatively, they can be purchased via the Initial Public Offering (IPO) route, i.e. directly from the company. Investing in equities is a good long-term investment option as the returns on equities over a long time horizon are generally higher than most other investment avenues. However, along with the possibility of greater returns comes greater risk.

Mutual funds

A mutual fund allows a group of people to pool their money together and have it professionally managed, in keeping with a predetermined investment objective. This investment avenue is popular because of its cost-efficiency, risk-diversification, professional management and sound regulation. Users can invest as little as Rs. 1,000 per month in a mutual fund. There are various general and thematic mutual funds to choose from and the risk and return possibilities vary accordingly.

Bonds

Bonds are fixed income instruments which are issued for the purpose of raising capital. Both private entities, such as companies, financial institutions, and the central or state government and other government institutions use this instrument as a means of garnering funds. Bonds issued by the Government carry the lowest level of risk but could deliver fair returns.

Deposits

Investing in bank or post-office deposits is a very common way of securing surplus funds. These instruments are at the low end of the risk-return spectrum.

Cash equivalents

These are relatively safe and highly liquid investment options. Treasury bills and money market funds are cash equivalents.

Non-financial Instruments

Real estate

With the ever-increasing cost of land, real estate has come up as a profitable investment proposition.

Gold

The 'yellow metal' is a preferred investment option, particularly when markets are volatile. Today, beyond physical gold, a number of products which derive their value from the price of gold are available for investment. These include gold futures and gold exchange traded funds.

Mutual Funds are subject to market risk. Please read the offer document carefully before investing. Terms and Conditions apply.

Debit card

A **debit card** (also known as a **bank card** or **check card**) is a plastic payment card that can be used instead of cash when making purchases. It is similar to a credit card, but unlike a credit card, the money comes directly from the user's bank account when performing a transaction.

Some cards may carry a stored value with which a payment is made, while most relay a message to the cardholder's bank to withdraw funds from a payer's designated bank account. In some cases, the primary account number is assigned exclusively for use on the Internet and there is no physical card.

In many countries, the use of debit cards has become so widespread that their volume has overtaken or entirely replacedcheques and, in some instances, cash transactions. The development of debit cards, unlike credit cards and charge cards, has generally been country specific resulting in a number of different systems around the world, which were often incompatible. Since the mid-2000s, a number of initiatives have allowed debit cards issued in one country to be used in other countries and allowed their use for internet and phone purchases.

Unlike credit and charge cards, payments using a debit card are immediately transferred from the cardholder's designated bank account, instead of them paying the money back at a later date.

Debit cards usually also allow for instant withdrawal of cash, acting as an ATM card for withdrawing cash. Merchants may also offer cash-back facilities to customers, where a customer can withdraw cash along with their purchase.

Types of Debit Cards

There are currently three ways that debit card transactions are processed:

- Online Debit Card (also known as EFTPOS or PIN debit)
- Offline debit (also known assignature debit)
- Electronic Purse Card System

One physical card can include the functions of all three types, so that it can be used in a number of different circumstances.

Online Debit System

Online debit cards require electronic authorization of every transaction and the debits are reflected in the user's account immediately. The transaction may be additionally secured with the Personal Identification Number (PIN) authentication system; some online cards require such authentication for every transaction, essentially becoming enhanced Automatic Teller Machine (ATM) cards.

One difficulty with using online debit cards is the necessity of an electronic authorization device at the Point of Sale (POS) and sometimes also a separatePIN pad to enter the PIN, although this is becoming commonplace for all card transactions in many countries.

Overall, the online debit card is generally viewed as superior to the offline debit card because of its more secure authentication system and live status, which alleviates problems with processing on transactions that may only issue online debit cards. Some on-line debit systems are using the normal authentication processes of Internet banking to provide real-time online debit transactions.

Offline Debit System

Offline debit cards have the logos of major credit cards (for example, Visaor MasterCard) or major debit cards (for example, Maestro) and are used at

the point of salelike a credit card (with payer's signature). This type of debit card may be subject to a daily limit, and/or a maximum limit equal to the current/checking account balance from which it draws funds. Transactions conducted with offline debit cards require 2–3 days to be reflected on users' account balances.

In some countries and with some banks and merchant service organizations, a "credit" or offline debit transaction is without cost to the purchaser beyond the face value of the transaction, while a fee may be charged for a "debit" or online debit transaction (although it is often absorbed by the retailer). Other differences are that online debit purchasers may opt to withdraw cash in addition to the amount of the debit purchase (if the merchant supports that functionality); also, from the merchant's standpoint, the merchant pays lower fees on online debit transaction as compared to "credit" (offline).

Electronic Purse Card system

Smart-cardbased electronic purse systems in which value is stored on the card chip, not in an externally recorded account, so that machines accepting the card need no network connectivity.

Advantages

Advantages of prepaid debit cards include being safer than carrying cash, worldwide functionality due to Visa and MasterCard merchant acceptance, not having to worry about paying a credit card bill or going into debt, the opportunity for anyone over the age of 18 to apply and be accepted without regard to credit quality, and the option to directly deposit paychecks and government benefits onto the card for free. And if a user has doubts about online security, using a prepaid debit card for online purchases protects their normal credit card from risk.

Risks

If the card provider offers an insecure website for letting you check the card's balance, this could give an attacker access to the card information. If you lose the card, and have not somehow registered it, you likely lose the money. If a provider has technical issues, the money might not be accessible when you need it. Some companies' payment systems do

not appear to accept prepaid debit cards. And there is a risk that prolific use of prepaid debit cards could lead data provider companies to miscategorize you in unfortunate ways.

Point of Sale (POS)

Point of Sale is the phrase used to refer to the point—or location—where a sales transaction takes place, such as a checkout line or retail counter. A Point of Sale *System* is the term used for the combination of computer hardware and software thatactually manages the sales transaction. There are many benefits of using a point of sale system over a traditional cash register, since a computer is able to capture, store, share, and report data (such as sales, payment, or customer information). A POS system saves time and duplication of work, and increases efficiency and accuracy in inventory, reporting, ordering, and providing excellent customer service.

The main industries where you would find POS systems being used are retail, service and hospitality (restaurants, hotels, hair & beauty).

There are many ways to evaluate a point of sale system. Speed, cost, functionality, and ease of use are a few. We consider the key requirement to be reliability, as a single lost transaction is unacceptable.

It is helpful to distinguish the forms that POS has gone through over the decades, from traditional point of sale developed in the 20th century, to the introduction of web-based and mobile point of sale in the 21st century.

Traditional POS

Traditional computerized point of sale, which began in the 1970's and came of age in the 90's, uses a stationary computer with POS software installed, and peripherals such a bar code scanner and receipt printer. Networking makes it possible for traditional POS to be used withmultiple stations and multiple stores, syncing information across various locations making it easier to keep track of sales and inventory.

Components of a traditional POS system

Components of a traditional POS system includes

Hardware:

- **A computer** (the main component of a traditional POS system).
- **Peripherals:** This term refers to hardware devices that are add to the computer system. Some peripherals helps the user to use the computer itself (such as a mouse or keyboard).
  Some peripherals are more specific to POS, they enable you to perform a sales transaction (cash drawers, bar code readers, receipt printers, credit card readers, pin pads, touch screens, etc.)

Software:

- **General computer software**, primarily, an Operating System (OS), such as Windows, Mac, or Linux, which makes it possible for people to use and interact with the computer.
- **POS software** which helps to manage business and perform sales transactions. It automatically collects and stores data about customers, sales, and inventory, and can use that data to create reports for taxes, sales analysis, etc. The software is the most critical part of the POS system.

It is important to that when putting together a Point of Sale system, the various hardware and software components must be compatible, or able to communicate with each other.

E-Benefit Transfer (EBT)

A system that allows state governments to provide and track benefits to authorized recipients via a plastic debit card. Common benefits provided via EBT are Food Stamps and Cash benefits. Recipients receive a plastic payment card with a magnetic strip and a PIN is issued. Cash benefits include State General Assistance, TANF (Temporary Aid for Needy Families) benefits and refugee benefits.

Cash and food stamp benefits are deposited into electronic benefit accounts which can be accessed using a Common Benefit Identification Card (CBIC) and Personal Identification Number (PIN). The Card can be used at EBT participating merchants and ATM machines and Point of Sale (POS) terminals throughout the state.

Smart Cards

A smart card, typically a type of chip card, is a plastic card that contains an embedded computer chip–either a**memory** or **microprocessor** type–that stores and transacts data. This data is usually associated with either value, information, or both and is stored and

processed within the card's chip. The card data is transacted via a reader that is part of a computing system.

Systems that are enhanced with smart cards are in use today throughout several key applications, including healthcare, banking, entertainment, and transportation. All applications can benefit from the added features and security that smart cards provide.

First introduced in Europe nearly three decades ago, smart cards debuted as a stored value tool for payphones to reduce theft. As smart cards and other chip-based cards advanced people found new ways to use them, including charge cards for credit purchases and for record keeping in place of paper.

Consumers have been using chip cards for everything from visiting libraries to buying groceries to attending movies, firmly integrating them into our everyday lives. Several U.S. states have chip card programs in progress for government applications ranging from the Department of Motor Vehicles to Electronic Benefit Transfers (EBTs). Many industries have implemented the power of smart cards in their products, such as the GSMdigital cellular phones as well as TV-satellite decoders.

Advantages of Smart Cards

Smart cards improve the convenience and security of any transaction. They provide tamper-proof storage of user and account identity. Smart card systems have proven to be more reliable than other machine-readable cards, like magnetic stripe and barcode, with many studies showing card read life and reader life improvements demonstrating much lower cost of system maintenance. Smart cards also provide vital components of system security for the exchange of data throughout virtually any type of network. They protect against a full range of security threats, from careless storage of user passwords to sophisticated system hacks. The costs to manage password resets for an organization or enterprise are very high, thus making smart cards a cost-effective solution in these environments. **Multifunction cards** can also be used to manage network system access and store value and other data.

Applications

Worldwide, people are now using smart cards for a wide variety of daily tasks, which include:

- **SIM Cards and Telecommunication**

The most prominent application of smart card technology is in Subscriber Identity Modules (**SIM**), required for all phone systems under the Global System for Mobile Communication (GSM) standard. Each phone utilizes the unique identifier, stored in the SIM, to manage the rights and privileges of each subscriber on various networks. This use case represents over half of all smart cards consumed each year. The Universal Subscriber Identification Modules (USIM) is also being used to bridge the identity gap as phones transition between GSM, UTMS, and 3G network operators.

- **Loyalty and Stored Value**

Another use of smart cards is stored value, particularly loyalty programs, which track and provide incentives to repeat customers. Stored value is more convenient and safer than cash. For issuers, float is realized on unspent balances and residuals on balances that are never used.

For multi-chain retailers that administer loyalty programs across many different businesses and POS systems, smart cards can centrally locate and track all data. The applications are numerous, such as transportation, parking, laundry, gaming, retail, and entertainment.

- **Securing Digital Content and Physical Assets**

In addition to information security, smart cards can ensure greater security of services and equipment by restricting access to only authorized user(s).

Information and entertainment is being delivered via satellite or cable to the home DVR player or cable box or cable-enabled PC. Home delivery of service is **encrypted and decrypted** via the smart card per subscriber access. Digital video broadcast systems have already adopted smart cards as electronic keys for protection.

Smart cards can also act as keys to machine settings for sensitive laboratory equipment and dispensers for drugs, tools, library cards, health club equipment etc. In some environments, smart card enabled- SD and microSD cards are protecting digital content as it is being delivered to the mobile hand-sets/phones.

- **E-Commerce**

Smart cards make it easy for consumers to securely store information and cash for purchasing. The advantages they offer consumers are:

- The card can carry personal account, credit and buying preference information that can be accessed with a mouse click instead of filling out forms.
- Cards can manage and control expenditures with automatic limits and reporting.
- Internet loyalty programs can be deployed across multiple vendors with disparate POS systems and the card acts as a secure central depository for points or rewards.
- Micro Payments - paying nominal costs without transaction fees associated with credit cards, or for amounts too small for cash, like reprint charges.

- **Bank Issued Smart Cards**

As banks enter competition in newly opened markets such as investment brokerages, they are securing transactions via smart cards at an increased rate. This means:

- Smart cards increase trust through improved security. Two-Factor Authentication insures protection of data and value across the internet. Threats such as the "Man in the middle" and "Trojan Horses" that replay a user name and password are eliminated
- This is improving customer service. Customers can use secure smart cards for fast, 24-hour electronic funds transfers over the internet
- Costs are reduced: transactions that normally would require a bank employee's time and paperwork can be managed electronically by the customer with a smart card

- **HealthcareInformatics**

The explosion of health care data introduces new challenges in maintaining the efficiency of patient care and privacy safeguards. Smart cards address both of these challenges with secure, mobile storage and distribution of patient information, from

emergency data to benefits status. Many socialized countries have already adopted smart cards as credentials for their health networks and as a means of carrying an immediately retrievable Electronic Health Record (EHR). Smart card benefits in healthcare include:

- Rapid, accurate identification of patients; improved treatment
- Reducing fraud through authentication of provider/patient visits and insurance eligibility
- A convenient way to carry data between systems or to sites without systems
- Reducing record maintenance costs

➢ **Embedded Medical Device Control**

For years, embedded controllers have been in many types of machines, governing the quality and precision of their function. In Healthcare, embedded smart cards ensure the best and safest delivery of care in devices such as dialysis machines, blood analyzers and laser eye surgery equipment.

➢ **Physical Access**

Businesses and universities of all types need simple identity cards for all employees and students. Most of these individuals are also granted access to certain data, equipment, and departments according to their status. Multifunction, ***microprocessor-based smart cards*** incorporate identity with access privileges and can also store value for use in various locations, such as cafeterias and stores. Many hotels have also adopted ISO 7816 type card readers to secure staff-only rooms and facilities.

Electronic Funds Transfer

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

One of the most widely-used EFT programs is Direct Deposit, in which payroll is deposited straight into an employee's bank account, although EFT refers to any transfer of funds initiated through an electronic terminal, including credit card, ATM, Fed-wire and

point-of-sale (POS) transactions. It is used for both credit transfers, such as payroll payments, and for debit transfers, such as mortgage payments.

Transactions are processed by the bank through the Automated Clearing House (ACH) network, the secure transfer system that connects all financial institutions. For payments, funds are transferred electronically from one bank account to the billing company's bank, usually less than a day after the scheduled payment date.

The growing popularity of EFT for online bill payment is paving the way for a paperless universe where checks, stamps, envelopes, and paper bills are obsolete. The benefits of EFT include reduced administrative costs, increased efficiency, simplified bookkeeping, and greater security. However, the number of companies who send and receive bills through the Internet is still relatively small.

Various Modes of Electronic Fund Transfers

Gone are the days when the payment and funds transfer sources were limited to physical methods such as direct currency exchange or a written cheque method. With the emergence of internet and mobile banking and the emerging e-commerce opportunities, banks too have marched ahead with introducing the concept of electronic funds transfer, which is much more convenient and hassle free.

Today, electronic funds transfer allows you to exchange funds between individuals as well as organizations via electronic gateways which can be accessed using internet, computers and smart phones. Funds can be transferred instantly from one account to another, either within the same bank or to a different bank network at any given time.

Advantages of Electronic Transfer

Electronic funds transfer is a much more preferred money transfer option as it allows customers to make money transfers at the comfort of their homes using integrated banking tools such as internet and mobile banking.

Besides being convenient, electronic transfer modes are safe, secure and make transferring money much simpler. Electronic transfers are processed immediately with the transferred amount being deducted from one account and credited to the other in real time,

thus saving time and effort involved in physically transferring a sum of money. Opting for electronic transferring system also reduces the possibilities of any mistakes as a transaction is only authorized with complete details which include the correct account number of the beneficiary and the target bank's specific IFSC code.

Transferring funds through Electronic

Transferring funds via electronic gateway is much simpler than the conventional methods. You can choose to: -

- Transfer funds into your own linked accounts of the same bank network.
- Transfer funds into different account of the same bank.
- Transfer funds into different bank's accounts using NEFT.
- Transfer funds into other bank accounts using RTGS
- Transfer funds into various accounts using IMPS.

Types of electronic funds transfer

- NEFT or National Electronics Funds Transfer
- RTGS or Real Time Gross Settlement
- IMPS or Immediate Payment Service.

NEFT

The National Electronic Funds Transfer is a nation-wide money transfer system which allows customers with the facility to electronically transfer funds from their respective bank accounts to any other account of the same bank or of any other bank network. Not just individuals but also firms and corporate organizations may use the NEFT system to transfer funds back and forth.

Funds transfer through NEFT requires a transferring bank and a destination bank. With the RBI organizing the records of all the bank branches at a centralized database, almost all the banks are enabled to carry out an NEFT transaction. Before transferring funds via NEFT you register the beneficiary, receiving funds. For this you must possess information such as name of the recipient, recipient's bank name, a valid account number belonging to the recipient and his respective bank's IFSC code. These fields are mandatory for a funds transfer to be authorized and processed.

NEFT transactions can be ordered anytime you want, even on holidays except for Sundays which are designated bank holidays. However, the transactions are settled in batches defined by the Reserve Bank of India depending upon specific time slots.

RTGS

Real Time Gross Settlement as the name suggests is a real-time funds transfer system which facilitates you to transfer funds from one bank to another in real time or on a gross basis. The transaction isn't put on a waiting list and cleared out instantly. RTGS payment gateway, maintained by the Reserve Bank of India makes transactions between banks electronically. The transferred amount is instantly deducted from the account of one banks and credited to the other bank's account.Users such as individuals, companies or firms can transfer large sums using the RTGS system.

The remitting customer needs to add the beneficiary and his bank account details prior to transacting funds via RTGS. A beneficiary can be registered through your internet banking portal. The details required while transferring funds would be the beneficiary's name; his/her account number, receiver's bank address and the IFSC code of the respective bank.

On successful transfer the Reserve Bank of India acknowledges the receiver bank and based on this the both the remitting bank as well as the receiving bank may/ may not notify the customers.

IMPS

Majority of the funds transferred using electronic channels are processed via NEFT or RTGS. But as the funds could only be cleared in batches using these transfer gateways, the National Payments Corporation of India introduced a pilot mobile payment project also known as the Immediate Payment Service (IMPS). Available to Indian public, IMPS offers instant electronic transfer service using mobile phones. IMPS interbank transfer service is available 24X7 and allows you to use your mobile phones to access your account and to authorize transfer of funds between accounts and banks. The IMPS service also features a secure transfer gateway and an immediate confirmation on fulfilled orders.

IMPS are offered on all the cellular devices via Mobile Banking or through SMS facility.To be able to transfer money via IMPS route you must first register for the immediate payment services with your bank. On obtaining the Mobile Money Identifier (MMID) and MPIN from the bank you can login or make a request via SMS to transfer a certain amount to a beneficiary. Meanwhile the beneficiary must link his/her mobile number with his/her respective account and obtain the MMID from the bank to be able to receive money.

To initiate a transfer you must enter the beneficiary's mobile number, beneficiary MMID, the transfer amount and your MPIN while requesting the fund transfer. As soon as the transaction is cleared, you receive a confirmation SMS on deduction from your account and the money credited into the beneficiary's account. The transaction reference number can be noted for future reference.

Thus IMPS enables customers to use mobile instruments as an instant money transfer gateway, facilitating user convenience and saving time and effort involved in other modes of transfer.

Regulatory Framework

The RBI, the Indian financial regulatory authority was on overdrive in 2008-2010, as it unleashed a progressive set of measures, to catalyze the electronic payments landscape in India.Under the Payment Systems & Settlements (PSS) Act of 2007, two regulations have been made by the Reserve Bank of India, the Board for Regulation and Supervision of Payment and Settlement Systems Regulation (BPSS), 2008 and the Payment and Settlement Systems Regulations, 2008. Both these Regulations came into force along with the PSS Act, 2007 on 12th August 2008. The BPSS would exercise the powers on behalf of the Reserve Bank, for regulation and supervision of the payment and settlement systems under the PSS Act, 2007.

The Payment and Settlement Systems Regulations, 2008 covers matters like form of application for authorization for commencing/ carrying on a payment system and grant of authorization, payment instructions and determination of standards of payment systems.

This in essence, permitted third party non banking entities to play the role of clearing and settlement in financial networks, with the permission of the RBI.

This was subsequently followed by the establishment of the National Payments Council with the following objectives:

"……to consolidate and integrate the multiple systems with varying service levels into nation-wide uniform and standard business process for all retail payment systems &….. to facilitate an affordable payment mechanism to benefit the common man across the country and help financial inclusion"

It published its vision for electronic payments in 2010, outlining the broad operating principles and focus areas. Considerable headway made in defining the methods and standards for mobile banking, prepaid card issuance & usage and financial inclusion, wherein leveraging retail distribution channels for financial inclusion related activities has become a reality.

Intelligent Agents

The Intelligent agent is software that assists people and acts ontheir behalf. Intelligent agents work by allowing people todelegate work that they could have done, to the agent software.

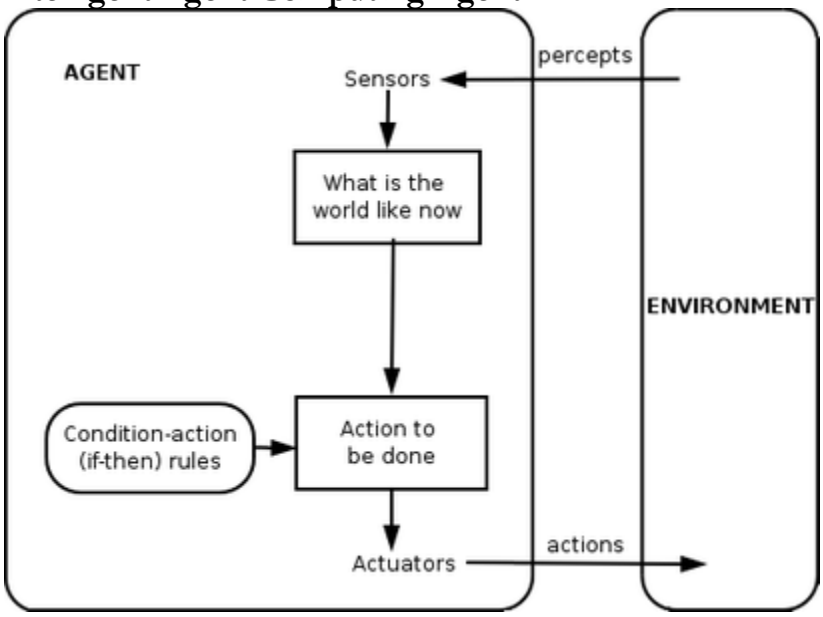
Agents can, just as assistants can, automate repetitive tasks,remember things the user might have forgotten, intelligentlysummarize complex data, learn from the user and even makerecommendations to the user. In addition to making recommendationsto the user, the agents can also make decisions andperform actions based on those decisions.

One typical use of the intelligent agent may be found in theexploration of data on the Internet. The Internet can be viewedas a large distributed Information resource, with connectingsystems that are designed and implemented by many differentorganizations with various goals and agendas. The growth ofthe Internet and correspondingly the vast amount of Informationit holds, presents a problem to the users-informationoverload. This causes a problem of locating the relevantinformation. As a result much of the information is

discardedand processed in a sub optimal manner. The agent technologymay help the user by helping the user get around this problem.

In times to come it is hoped that agent technology can enhancethe feature of electronic commerce by efficiently matching buyersand sellers.

Intelligent Agent Computing Agent



Three primary dimensions of the agents have been defined:

- Agency
- Intelligence
- Mobility

1. **Agency:** The degree of autonomous action that can betaken; that is actions performed without the need for directhuman intervention or intervention by other agents. Theagents should have control over the actions performedwithin its system, i.e., not have actions performed by otheragents. Other agents can request actions, but the agent itselfdecides whether to approve and allow the action.

2. **Intelligence:** The extent to which an agent can understandits own internal state and its external environment. The levelof intelligence is further classified according to its ability torespond, to adapt and to take initiative.

3. **Respond:** Agents should perceive and respond to theirenvironments.

Online Credit Card-Based Systems

Payment using credit card is one of most common mode of electronic payment. Credit card is small plastic card with a unique number attached with an account. It has also a magnetic strip embedded in it which is used to read credit card via card readers. When a customer purchases a product via credit card, credit card issuer bank pays on behalf of the customer and customer has a certain time period after which he/she can pay the credit card bill. It is usually credit card monthly payment cycle. Following are the actors in the credit card system.

- The card holder - Customer
- The merchant - seller of product who can accept credit card payments.
- The card issuer bank - card holder's bank
- The acquirer bank - the merchant's bank
- The card brand - for example, visa or mastercard.

Credit card payment process

The steps involved in credit card process is as follows

Step	Description
Step 1	Bank issues and activates a credit card to customer on his/her request.
Step 2	Customer presents credit card information to merchant site or to merchant from whom he/she want to purchase a product/service.
Step 3	Merchant validates customer's identity by asking for approval from card brand company.
Step 4	Card brand company authenticates the credit card and paid the transaction by credit. Merchant keeps the sales slip.
Step 5	Merchant submits the sales slip to acquirer banks and gets the service chargers paid to him/her.

Step 6	Acquirer bank requests the card brand company to clear the credit amount and gets the payment.
Step 6	Now card brand company asks to clear amount from the issuer bank and amount gets transferred to card brand company.

Types of Credit Card Payments

Credit card-based payments can be divided into three categories:

- Payments using plain credit card details
- Payments using encrypted credit card details
- Payments using third-party verification

Payments using plain credit card details:

The easiest methodof credit card payment is the exchange of unencrypted creditcards over a public network such as telephone lines or theInternet. The low level of security inherent in the design of theInternet makes this method problematic (any hacker can read acredit card number, and there are programs that scan theInternet traffic for credit card numbers and send the numbers totheir programmers). Authentication is also a significantproblem, and the vendor is usually responsible for ensuringthat the person using the credit card is its owner.

Payments using encrypted credit card details:

Even if creditcard details are encrypted before they are sent over the Internet,there are still certain factors to consider before sending themout. One such factor is the cost of a credit card transaction itself,which might prohibit low-value payments (micro payments).

Payments using third-party verification:

One solution tosecurity and verification problems is the introduction of a thirdparty to collect and approve payments from one client toanother.

Payments Using Encrypted Credit Card Details

Encryption is initiated when credit card information is enteredinto a browser or other electronic commerce device and sentsecurely over the network from buyer to seller as an

encryptedmessage. This practice, however, does not meet important requirementsfor an adequate financial system, such asnon-refutability, speed, safety, privacy, and security.

To make a credit card transaction truly secure and non-refutable,the following sequence of steps must occur before actualgoods, services, or funds flow:

1. A customer presents his or her credit card information (alongwith an authentic signature or other information such asmother's maiden name) securely to the merchant.

2. The merchant validates the customer's identity as the ownerof the credit card account.

3. The merchant relays the credit card charge information anddigital signature to his or her bank or online credit cardprocessor.

4. The bank or processing party relays the information to thecustomer's bank for authorization approval.

5. The customer's bank returns the credit card data, chargeauthentication, and authorization to the merchant.

One company that has implemented the preceding process isCyberCash (www.cybercash.com). CyberCash transactions movebetween three separate software programs: one program that resides on the consumer's PC (called a wallet), one that operatesas part of the merchant server, and one that operates within theCyberCash servers.

The process works in the following manner:

1. The consumer selects items for purchase and fills out the merchant's order form, complete with necessary shipping information.
2. The merchant server presents an invoice to the consumer and requests payment. The consumer is given the option to launch the Cyber Cash Wallet, a software program that does the encryption, if they al-ready have it. When the consumer clicks on the "PAY" button, the Cyber Cash software on the

merchant server sends a special message to the consumer's PC that awakens the Cyber Cash Wallet.

3. The consumer simply chooses which credit card to pay with and clicks on it.

The rest of the process is a series of encryptedautomatic messages that travel between the three parties on theInternet and the conventional credit card networks that areconnected directly to the Cyber Cash servers. Since the CyberCash Wallet is a separate piece of software, the consumer canuse virtually any browser to shop at a merchant on the Web.Cyber Cash can also be used for micro payments, that is, peoplepay small change-usually a nickel or a dime-as they click on icons,which could be information or files. The process is an offshootof CyberCash's Wallet technology.

Currently, users downloadfree Wallet software to their PC and load it up electronically witha credit card cash advance. The plan for micro payments is tocreate a "small change" version, which would dip from a savings account as well as a credit card. After selecting a game toplay or item to buy, an invoice comes on screen. The consumerclicks on a Pay button, and a transaction is encrypted thattransfers money out of a coin purse icon and into the vendor'saccount, which is-set up on a CyberCash server.

Designing Electronic Payment System

Basic Requirements

Designing an electronic payment system should have the following requirements

1. Technological Requirements

- When designing an electronic payment system, the system's ability of the effectiveness and the security of each transaction and the degree of compatibility with the online shop must be taken into consideration.
- A payment system requires the greatest level of security in electronic commerce transactions.

- It must have confidentiality, authenticity, integrity and non-repudiation of transactions.

2. Economic Requirements

- These deal with the cost of transaction which refers to the amount paid by the client.
- Economic assessments include also atomic exchange which means that the consumer will pay money or something equivalent in value.
- An electronic payment system must also be accessible in all countries of the world, to all ages (user range) or currency in equal value and must not be restricted to the company that created the value.
- Economic needs also deal with financial risks,because consumers and merchants are very concerned about the degree of security involved in online transactions.
- Return on Investment(ROI) is a economic parameter and a performance measure used to evaluate the efficiency of an investment.

3. Social Requirements

- Payment system must prevent companies or financial institutions from tracing user information and must be simple and user-friendly.As social needs, electronic payment methods should also be accessible anywhere.

4. Legal Requirements

- Electronic payment system must abide by governmental regulations and the law and guaranty all necessary proofs (digital signature, contracts,...)to protect users performing domestic/international transactions.

Components that Make E-Payment System

1. DATABASE INTEGRATION

- An integration database is a database which acts as the data store for multiple applications, and thus integrates data across these applications (in contrast to an

ApplicationDatabase). An integration database needs a schema that takes all its client applications into account.

- Each record should be kept in separate database.
- Each database must be linked together to access from anywhere.

2. BROKERS

- The role of electronic brokers facilitates financial transactions electronically.
- The information superhighway directly connects millions of people, each both a consumer of information and a potential provider. If their exchanges are to be efficient, yet protected on matters of privacy, sophisticated mediators are required. Electronic brokers play this important role by organizing markets that promote the efficient production and consumption of information.
- Electronic brokers will be required to permit even reasonably efficient levels and patterns of exchanges.
- Their ability to handle complex, albeit mechanical, transactions, to process millions of bits of information per second, and to act in a demonstrably even-handed fashion will be critical as this information market develops.
- Electronic brokers can also run pricing systems, charging and crediting slight amounts to individual accounts as bits careen along the superhighway.

3. STANDARDS

- The e-payment standards enable payment users to link with various networks and other payment systems.
- Standards for interoperability which enable users to buy and receive information regardless of which bank is managing their money.

4. PRICING

- Payment card networks, such as Visa, require merchants' banks to pay substantial "interchange" fees to cardholders' banks, on a per transaction basis.

- Consumers make two distinct decisions (membership and usage) whereas merchants make only one (membership).

5. PRIVACY

- Protecting the privacy of evaluators and their information is another important policy concern of e-payment system.
- Contemporary standards of fairness require that many documents, ranging from letters to the editor to personnel evaluations, be signed, and that one's accuser be identified in court.
- Signed evaluations are less likely to be unfair and, over time, people can identify trustworthy evaluators.

Electronic payment gateway interfaces

In a model of electronic payment gateway-there are five interfaces.

1. Customer Interface
2. Server (e-payment Gateway) Interface
3. Client Bank Interface
4. Merchant Bank Interface
5. Merchant Interface

Online Customer will connect to e-payment gateway through Internet. Gateway will connectto the Bank and check whether their bank account is enough to buy the required product. Online customer can also visit Merchant's website through Gateway.

Protocol Design and Verification

Success of electronic payment system is based on the design principals and its correctness.Rules, formats, and procedures that have been agreed upon between participating parties are collectively called a protocol. The protocol, then, can contain agreements on the methods used for:

· Initiation and termination of data exchanges.
· Synchronization of senders and receivers.
· Detection and correction of transmission errors.

· Formatting and encoding of data.

A protocol specification consists of five distinct parts. To be complete, each specification should include explicitly:

1. The service to be provided by the protocol.
2. The assumptions about the environment in which the protocol is executed.
3. The vocabulary of messages used to implement the protocol.
4. The encoding (format) of each message in the vocabulary.
5. The procedure rules guarding the consistency of message exchanges.

Secure Electronic Transaction

Secure Electronic Transaction (**SET**) was a communications protocol standard for securing credit card transactions over insecure networks, specifically, the Internet. SET was not itself a payment system, but rather a set of security protocols and formats that enabled users to employ the existing credit card payment infrastructure on an open network in a secure fashion. However, it failed to gain attraction in the market. VISA now promotes the 3-D secure scheme.

History and development

SET was developed by the **SET Consortium**, established in 1996 by VISA andMasterCard in cooperation with GTE, IBM, Microsoft, Netscape, SAIC, Terisa Systems, RSA, and VeriSign. The consortium's goal was to combine the card associations' similar but incompatible protocols (STT from Visa/Microsoft and SEPP from MasterCard/IBM) into a single standard.

SET allowed parties to identify themselves to each other and exchange information securely. Binding of identities was based on X.509 certificates with several extensions. SET used a cryptographic blinding algorithm that, in effect, would have let merchants substitute a certificate for a user's credit-card number. If SET were used, the merchant itself would never have had to know the credit-card numbers being sent from the buyer, which would have provided verified good payment but protected customers and credit companies from fraud.

SET was intended to become the de facto standard payment method on the Internet between the merchants, the buyers, and the credit-card companies.

Key features of SET

To meet the business requirements, SET incorporates the following features:

- Confidentiality of information
- Integrity of data
- Cardholder account authentication
- Merchant authentication

Participants

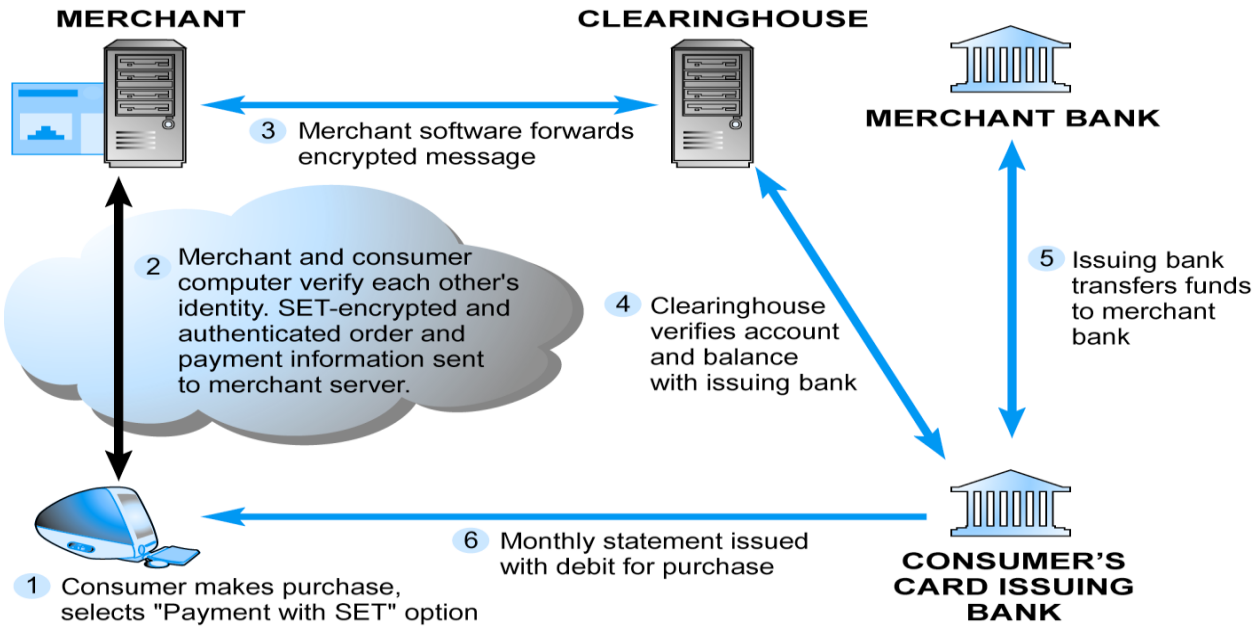
A SET system includes the following participants:

- Cardholder
- Merchant
- Issuer
- Acquirer
- Payment gateway
- Certification authority

Functioning of SET

Both cardholders and merchants must register with CA (Certificate Authority) first, before they can buy or sell on the Internet. Once registration is done, cardholder and merchant can start to do transactions, which involve 9 basic steps in this protocol, which is simplified.

1. Customer browses website and decides on what to purchase
2. Customer sends order and payment information, which includes 2 parts in one message:
    a. Purchase Order – this part is for merchant
    b. Card Information – this part is for merchant's bank only.
3. Merchant forwards card information (part b) to their bank
4. Merchant's bank checks with Issuer for payment authorization
5. Issuer send authorization to Merchant's bank
6. Merchant's bank send authorization to merchant
7. Merchant completes the order and sends confirmation to the customer
8. Merchant captures the transaction from their bank
9. Issuer prints credit card bill (invoice) to customer



Dual signature

An important innovation introduced in SET is the *dual signature*. The purpose of the dual signature is to link two messages that are intended for two different recipients. In this case, the customer wants to send the order information (OI) to the merchant and the payment information (PI) to the bank. The merchant does not need to know the customer's credit-card number, and the bank does not need to know the details of the customer's order. The customer is afforded extra protection in terms of privacy by keeping these two items separate. However, the two items must be linked in a way that can be used to resolve disputes if necessary. The link is needed so that the customer can prove that this payment is intended for this order and not for some other goods or service.

The message digest (MD) of the OI and the PI are independently calculated by the customer. The dual signature is the encrypted MD (with the customer's secret key) of the concatenated MD's of PI and OI. The dual signature is sent to both the merchant and the bank. The protocol arranges for the merchant to see the MD of the PI without seeing the PI itself, and the bank sees the MD of the OI but not the OI itself. The dual signature can be verified using the MD of the OI or PI. It doesn't require the OI or PI itself. Its MD does not reveal the content of the OI or PI, and thus privacy is preserved.

Unit 3

Electronic Data Interchange (EDI)

As a cost-conscious, highly competitive electronic commerce environment comes of age,businesses are looking at **electronic data interchange (EDI)** in a new light. EDI is defined asthe inter-process communication (computer application to computer application) of businessinformation in a standardized electronic form. In short, EDI communicates information forbusiness transactions between the computer systems of companies, government organizations,small businesses, and banks.

Using EDI, trading partners establish computer-to-computer links that enable them to exchangeinformation electronically. This allows businesses to better cope with a growing avalanche(toomany) of paperwork: purchase orders, invoices, confirmation notices, shipping receipts, andother documents. With the aid of EDI, all these documents are in electronic form, which aliasesmore work automation to occur and even alters the way business is done.

Many industries see EDI as essential for reducing cycle and order fulfillment times.Manufacturers work with customers and suppliers to convert to an electronic exchange the hugevolume of orders and records that now crawl back and forth on paper. In retailing, EDI canprovide vendors with a snapshot of what stores are selling, enabling them to recognize and meettheir customer's needs much faster than in the past. In addition, it enables retailers and vendors toplace orders and pay bills electronically, reducing time and the expense of paperwork.

The primary benefit of EDI to business is a considerable reduction in transaction costs, byimproving the speed and efficiency of filling orders. Studies show that it takes up to five times aslong to process a purchase order manually as it does electronically.

Ironically, despite these advantages, EDI is not (yet) widely used. It is estimated that out ofmillions of businesses in the United States, only 44,000 companies exchange business dataelectronically. Only about 10 percent of these companies use EDI for financial

transactions.Moreover, no more than fifty banks have the capability of providing complete financial EDIservices to their corporate customers.

Background of Electronic Data Interchange: EDI developed in the 1960s as a means of accelerating the movement of documents pertaining to shipments and transportation. Not until the mid-1980s, however, was the technique used in a wide range of industries—automotive, retail, transportation, and international trade. Its use is growing and it is set to become the standard by which organizations will communicate formally with each other in the world of electronic commerce.

Electronic commerce is often equated with EDI, so it is important to clarify that electronic commerce embraces EDI and much more. In electronic commerce, EDI techniques are aimed at improving the interchange of information between trading partners, suppliers, and customers by bringing down the boundaries that restrict how they interact and do business with each other.

Technically speaking, EDI is one well-known example of structured document interchange which enables data in the form of document content to be exchanged between software applications that are working together to process a business transaction.

Emphasis must be placed on the fact that EDI only specifies a format for business information, that the actual transmission of the information is tackled by other underlying transport mechanisms such as e-mail or point-to-point connections.

Defining EDI: Because of the different approaches in the development and implementation of EDI, there is no one consensus on a definition of EDI. A review of some of the prevailing definitions follows:

Electronic data interchange is the transmission, in a standard syntax, of unambiguous information of business between computers of independent organizations. [The Accredited Standards Committee for EDI of the American National Standards Institute]

Electronic data interchange is the interchange of standard formatted data between computer application systems of trading partners with minimal manual

intervention.Electronic data interchange is the electronic transfer, from computer to computer, of commercial and administrative data using an agreed standard to structure an EDI message.

EDI Layered Architecture

EDI architecture specifies four layers:

1. **Semantic** (or application) layer
2. Standards **translation** layer
3. Packing (or **transport**) layer,
4. **physical** network infrastructure layer

The following figure shows the layered architecture of EDI.

Layered Architecture of EDI

EDI semantic layer	Application level services	
EDI Standard layer	EDIFACT business form standards	
	ANSI X12 business form standards	
EDI transport layer	Electronic mail	X.435, MIME
	Point to Point	FTP, Telnet
	WWW	HTTP
Physical layer	Dial up lines, Internet	

1. **Semantic Layer**

The EDI **semantic layer** describes the business application that is driving EDI. For aprocurement application, this translates into requests for quotes, price quotes, purchase orders,acknowledgments, and invoices. This layer is specific to a company and the software it uses. Inother words, the user interface is customized to local environments.

The information seen at the EDI semantic layer must be translated from a company-specific formto a more generic or universal form so that it can be sent to various trading

partners, who couldbe using a variety of software applications at their end. To achieve this, companies must adoptuniversal EDI standards that lay out the acceptable fields of business forms. What complicatesmatters is the presence of two competing standards that define the content and structure of EDIforms: the **X12 standard**, developed by the American National Standards Institute (ANSI), and**EDIFACT**, developed by United Nations Economic Commission for Europe (UN /ECE).

When the trading partner sends a document, the EDI translation software converts the proprietaryformat into a standard mutually agreed on by the processing systems. When a company receivesthe document, their EDI translation software automatically changes the standard format into theproprietary format of their document processing software so that the company can manipulatethe information in whatever way it chooses to.

EDI Documents

Following are few important documents used in EDI −

- Invoices
- Purchase orders
- Shipping Requests
- Acknowledgement
- Business Correspondence letters
- Financial information letters

Steps in an EDI System

Following are the steps in an EDI System.

- A program generates the file which contains the processed document.
- The document is converted into an agreed standard format.
- The file containing the document is sent electronically on network.
- The trading partner receives the file.
- An acknowledgement document is generated and sent to the originating organization.

Advantages of an EDI System

Following are the advantages of an EDI System.

- **Reduction in data entry errors.** − Chances of errors are much less being use of computer in data entry.

- **Shorter processing life cycle** − as orders can be processed as soon as they are entered into the system. This reduced the processing time of the transfer documents.
- **Electronic form of data** − It is quite easy to transfer or share data being in electronic format.
- **Reduction in paperwork** − as lot of paper documents are replaced with electronic documents there is huge reduction in paperwork.
- **Cost Effective** − as time is saved and orders are processed very effectively, EDI proves to be highly cost effective.
- **Standard Means of communication** − EDI enforces standards on the content of data and its format which leads to clearer communication.

Applications in Business

EDI continues to prove its major business value by lowering costs, improving speed, accuracy and business efficiency. The greatest EDI benefits often come at the strategic business level.

According to a recent research study from Forrester, EDI continues to prove its worth as an electronic message data format. This research states that "the annual volume of global EDI transactions exceeds 20 billion per year and is still growing."[1] For buyers that handle numerous transactions, using EDI can result in millions of dollars of annual savings due to early payment discounts. From a financial perspective alone, there are impressive benefits from implementing EDI. Exchanging documents electronically improves transaction speed and visibility while decreasing the amount of money you spend on manual processes. But cost savings is far from the only benefit of using EDI.

But let's start with ***cost savings*** anyway:

- Expenses associated with paper, printing, reproduction, storage, filing, postage and document retrieval are all reduced or eliminated when you switch to EDI transactions, lowering your transaction costs by at least 35%
- A major electronics manufacturer calculates the cost of processing an order manually at $38 compared to just $1.35 for an order processed using EDI
- Errors due to illegible faxes, lost orders or incorrectly taken phone orders are eliminated, saving your staff valuable time from handling data disputes

The major benefits of EDI are often stated as ***speed and accuracy***:

- EDI can speed up your business cycles by 61%. Exchange transactions in minutes instead of the days or weeks of wait time from the postal service
- Improves data quality, delivering at least a 30—40% reduction in transactions with errors—eliminating errors from illegible handwriting, lost faxes/mail and keying and re-keying errors
- Using EDI can reduce the order-to-cash cycle time by more than 20%, improving business partner transactions and relationships

However, the increase in business ***efficiency*** is also a major factor:

- Automating paper-based tasks allows your staff to concentrate on higher-value tasks and provides them with the tools to be more productive
- Quick processing of accurate business documents leads to less re-working of orders, fewer stock outs and fewer cancelled orders
- Automating the exchange of data between applications across a supply chain can ensure that business-critical data is sent on time and can be tracked in real time. Sellers benefit from improved cash flow and reduced order-to-cash cycles
- Shortening the order processing and delivery times means that organizations can reduce their inventory levels

In many cases, the greatest EDI benefits come at the ***strategic*** business level:

- Enables real-time visibility into transaction status. This in turn enables faster decision-making and improved responsiveness to changing customer and market demands, and allows businesses to adopt a demand-driven business model rather than a supply-driven one
- Shortens the lead times for product enhancements and new product delivery

- Streamlines your ability to enter new territories and markets. EDI provides a common business language that facilitates business partner on-boarding anywhere in the world
- Promotes corporate social responsibility and sustainability by replacing paper-based processes with electronic alternatives. This will both save you money and reduce your CO2 emissions

EDI Applications in various fields of Business

Although EDI was developed to improve transportation and trade, it has spread everywhere. Inshort, EDI has grown from its original (and somewhat limited) use as expediter of the transfer oftrade goods to facilitator of standard format data between any two computer systems.

An examination of EDI usage in various industries provides insight into the business problemsthat EDI is attempting to solve. We will present four very different scenarios in industries thatuse EDI extensively:

1. International or cross-border trade,
2. Financial EDI or Electronic Funds Transfer (EFT),
3. Health care EDI for insurance claims processing, and
4. Manufacturing and retail procurement.

As these examples illustrate, companies have applied a number of EDI based solutions toimprove business processes—for both strategic and competitive advantages. In some cases EDIhas transformed operational aspects of a company's business. Increased quality and costreductions can significantly change industry standards of competition as innovators exert greaterpressure on competitors to meet new standards of customer satisfaction and productivity. Inothers, EDI has shaped a company's marketing and distribution efforts by helping to create newdistribution channels, develop new merchandising and market research methods, and introducebetter customer service. In sum, major improvements in product manufacturing and customerservice response time allow companies to be more competitive.

Let us describe the EDI business applications briefly:

1. International or cross-border trade

EDI has always been very closely linked with international trade. Over the last few years,significant progress has been made toward the establishment of more open and dynamictrade relations. Recent years have brought the General Agreement on Tariffs and Trade(GATT); the Free Trade Agreement (NAFTA) among the United States, Canada, andMexico; and the creation of the European Union. These developments have meant thelifting of long-standing trade restrictions. Many countries, and in particular developingcountries, have made significant efforts to liberalize and adjust their trade policies. In thiscontext, trade efficiency, which allows faster, simpler, broader and less costlytransactions, is a necessity. It is a widely held view that trade efficiency can beaccomplished only by using EDI as a primary global transactions medium.

2. Financial EDI or electronic funds transfer (EFT)

Financial EDI comprises the electronic transmission of payments and remittanceinformation between a payer, payee, and their respective banks. This section examinesthe ways business-to-business payments are made today and describes the variousmethods for making financial EDI payments.

Financial EDI allows businesses to replace the labor-intensive activities associated withissuing, mailing, and collecting checks through the banking system with automatedinitiation, transmission, and processing of payment instructions. Thus it eliminates thedelays inherent in processing checks.

Types of Financial EDI: Traditionally, wholesale or business-to-business payment isaccomplished using checks, EFT, and automated clearinghouses (ACH) for domestic andinternational funds transfer. ACH provides two basic services to industrial and financialcorporate customers (including other banks): (1) fast transmission of information abouttheir financial balances throughout the world, and (2) the movement of moneyinternationally at rapid speed for settlement of debit/credit balance. Banks havedeveloped sophisticated cash management systems on the back of these services

thatessentially reduce the amount of money companies leave idly floating in low-earningaccounts.

Thus, three principal types of noncash payment instruments currently used for business-to-business payments: **checks, electronic funds transfers, and automatedclearinghouse (ACH)** transfers.

3. Health care EDI for insurance claims processing, and

Providing good & affordable health care is a universal problem. EDI is becoming a permanent fixture in both insurance & health care industries asmedical provider, patients, & payers. Electronic claim processing is quick & reduces the administrative costs of health care. Using EDI software, service providers prepare the forms & submit claims viacommunication lines to the value-added network service provider. The company then edits sorts & distributes forms to the payer. If necessary, the insurancecompany can electronically route transactions to a third-party for price evaluation. Claims submission also receives reports regarding claim status & request for additional information.

4. Manufacturing and retail procurement.

Both manufacturing and retail procurement are already heavy users of EDI. Inmanufacturing, EDI is used to support just-in-time. In retailing, EDI is used to supportquick response.

Just-in-Time and EDI: Companies using JIT and EDI no longer stock thousands oflarge parts in advance of their use. Instead, they calculate how many parts are neededeach day based on the production schedule and electronically transmit orders andschedules to suppliers every day or its some cases every 30 minutes. Parts are deliveredto the plant "just in time" for production activity.

Quick Response and EDI: Taking their cue from the efficiencies manufacturers havegained from just-in-time manufacturing techniques, retailers are redefining practicesthrough the entire supply chain using quick response (QR) systems. For the customer, QRmeans better service and availability of a wider range of products. For the retailer andsuppliers, QR may mean survival in a competitive marketplace.

Much of the focus of QR is in reduction of lead times using event-driven EDI.Occurrences such as inventories falling below a specified level immediately trigger achain of events including automatic ordering from one company's application directlyinto the other's application. In QR, EDI documents include purchase orders, shippingnotices, invoices, inventory position, catalogs, and order status.

Legal, Security and Privacy Issues

THE LEGAL ISSUES OF ELECTRONIC COMMERCE AND DEVELOPMENTS IN INDIA ISSUES ADDRESSED BY DRAFT E-COMMERCE ACT

Electronic Commerce (EC) / Electronic Data Interchange (EDI) is revolutionizing the way people look at commercial as well as administrative exchanges of information because it does not require paper. Ordinarily, EC/EDI poses no problem in many commercial or administrative communications such as exchange of memoranda, letters and trade information. However EC/EDI becomes problematic in the case of structured communications where data is formatted according to an agreed standard and where legal rights and obligations are created.

In a world of paper documents, the established norms of contract and commercial law have been sufficient to resolve legal disputes concerning these documents. However, in an EDI setting, new risks and problems are involved, requiring new modes of thinking and behavior, e.g.

- When does an EDI transaction become binding?
- What can be done in place of a signature?
- Who bears the risk of erroneous transmission, lost record, sabotage and fraud? etc.,

In general, the legal issues that are raised by the use of EC/EDI include evidential, contractual, and liability issues.

The evidential issues of EDI have two distinct aspects. The first considers the questions of admissibility, whether an electronic document is admissible as evidence in court. The second aspect considers the need to have trade data properly authenticated, the requirement to be signed.

The contractual issues of EDI consider the impact that the use of EDI may have on traditional contract formation.

Within an EDI network, there exists two major relationships, those between service providers and users; and an agreement between the users themselves. These relationships leads to commercial responsibility and extent of liability created through use of EDI.

Legislative Amendments

To take care of these issues at the legislative level the amendments would have to be carried out in various Acts so that the information and documents generated, stored or communicated by electronic, optical or analogous means including, but not limited to, electronic data interchange, electronic mail, telegram, telex or telecopy, is admissible as primary evidence in the courts.

Further there are interchange agreements which defines the necessary rules and relationships between parties to a particular use of EDI. However, these are concerned with the interchange themselves, defining the rights and obligations of the parties engaged in the computer to computer exchange of data. The data content will relate to another contractual situation of sale, transport or the like, and remain outside the scope of the interchange agreements.

In order to facilitate rapid, integrated and dispersed implementation of Electronic Commerce (EC)/Electronic Data Interchange (EDI) in the country, it was necessary to consider admissibility of EC/EDI generated contracts/documents as legal and acceptable as primary evidence in court. Therefore an *Inter Departmental Legal Committee on EC/EDI* was constituted by the Ministry of Commerce for recommending the legal requirements needed for the admissibility of EC/EDI contracts and commercial transactions. The objective of the committee was :

- To decide the legal requirements needed for the admissibility of EDI contracts and commercial transactions;
- Review the current laws in India that has a bearing on evidential (admissibility and authentication), contractual and liability issues for the implementation of Electronic Commerce in general and EDI in particular;

- Identify any legislative policies, procedures (both legislative and administrative) that may have to be amended to tackle evidential, contractual and liability issues for EDI contracts/transactions;
- Recommend legal policies, amendments and administrative regulations that may be required to legalize transactions derived from EC/EDI in trade;
- To consider any other related issues of EC/EDI.

The Committee looked into all the aspects referred in the Model Law of UNCITRAL on Legal Aspects of EDI and Related means of Communication and after detail discussions has now finalized its report i.e. Electronic Commerce Act and Electronic Commerce Support Act. The report has been submitted to Law Ministry for consideration.

The Electronic Commerce Act of 1998 aims to facilitate the development of a secure regulatory environment for Electronic Commerce by providing a legal infrastructure governing electronic contracting, security and integrity of electronic transactions, the use of digital signatures and other issues related to electronic commerce. The act provides the definition of all the requisite terms and addresses the following broad areas:

Electronic Records and Signature Generally;

Secure Electronic Records and Signatures;

Electronic Contracts;

Effect of Digital Signatures;

General Duties Relating to Digital Signatures;

Duties of Certification Authorities;

Duties of Subscribers;

Regulation of Certification Authorities and Repositories;

Government use of Electronic records and Signatures;

Liability of Network Service Providers;

Computer Crime; and

General

The Electronic Commerce Support Act, 1998 serves to amend various Indian Acts to facilitate the continued growth of electronic commerce and to resolve the questions raised

regarding the applicability of such legislation to the unique features of the electronic regime. The Act suggests amendments in the following Acts:

Amendments to the Indian Penal Code, 1860 ;

Amendments to the Indian Evidence Act, 1872;

Amendments to the Contract Act, 1872;

Amendments to the Indian Telegraph Act, 1885;

Amendments to the Banker's Books Evidence Act, 1891;

Amendments to the General Clauses Act, 1897; and

Amendments to the Reserve Bank of India Act, 1934

Digital Signatures and EDI: The cryptographic community is exploring various technical uses of digital signatures by which messages might be time-stamped or digitally notarized to establish dates and times at which a recipient might claim to have had access or even read a particular message. If digital signatures are to replace handwritten signatures, they must have the same legal status as handwritten signatures (documents signed with digital signatures must be legally binding). For example, an on-line "notarized time-stamping" service has been suggested that would accept a message and return one showing the date, time, and a digital signature binding the notarized message content and received date and time to the digital public notary. The digital signature provides a means for a third party to verify that the notarized object is authentic. Digital signatures should have greater legal authority than handwritten signatures. For instance, if a ten-page contract is signed by hand on the tenth page, one cannot be sure that the first nine pages have not been altered. If the contract was signed by digital signatures, however, a third party can verify that not one byte of the contract has been altered.

EDI andE-Commerce

The economic advantages of EDI are widely recognized. But until recently, companies have beenable to improve only discrete processes such as automating the accounts payable function or thefunds transfer process. Companies are realizing that to truly

improve their productivity they needto automate their external processes as well as their internal processes. This is the thrust of newdirections in EDI.

New EDI services for electronic commerce are seen as the future bridge that automates externaland internal business processes, enabling companies to improve their productivity on a scalenever before possible. They present information management solutions that allow companies tolink their trading community electronically—order entry, purchasing, accounts payable, fundstransfer, and other systems interact with each other throughout the community to link thecompany with its suppliers, distributors, customers, banks, and transportation and logisticsoperations.

Another goal of new EDI services is to reduce the cost of setting up an EDI relationship. Thesecosts are still very high because of the need for a detailed bilateral agreement between theinvolved business partners and for the necessary technical agreements. Therefore most successfulEDI implementations are either in long-term partnerships or among a limited number of partners.With the advent of inter-organizational commerce, several new type of EDI are emerging thatcan be broadly categorized as **traditional EDI** and **open EDI**.

Traditional EDI: Traditional EDI replaces the paper forms with almost strict one-to-one mappingsbetween parts of a paper form to fields of electronic forms called transaction sets.

Traditional EDI covers two basic business areas:

i) Trade data interchange (TDI) encompasses transactions such as purchase orders,invoices, and acknowledgments.

ii) Electronic funds transfer (EFT) is the automatic transfer of funds among banks andother organizations.

Today, traditional EDI is divided into two camps: old EDI and new EDI. Old EDI is a termcreated by those working on the next generation of EDI standards in order to differentiatebetween the present and the future.

Old EDI refers to the current practice of automating the exchange of information pertinent to thebusiness activity. Information that is generated by the business process of one computer istransferred electronically and affects a corresponding business process in another computer.OldEDI is also used to refer to the current EDI-standardization process (e.g., X12, EDIFACT) wheretens of thousands of people in groups (or working committees) all around the world areattempting to define generic document interchanges (e.g., purchase orders) that allow everycompany to choose its own, unique, proprietary version (that is a subset of the originaltransaction set).

New EDI is really a refocus of the standardization process. With old EDI, the standardization isfocused on the interchange structure, on the transaction set in X12 or the message in EDIFACT.With new EDI the structure of the interchanges is determined by the programmer who writes thebusiness application program, not by the lengthy standards process.

Open EDI provides a framework where two potential trading partners can whip out an EDIstructure for their potential partnership in the short time frame that it takes them to draw up andnegotiate the legal contracts. The increased interest in open EDT is a result of dissatisfactionwith traditional EDI. Open EDI is a business procedure that enables electronic commerce tooccur between organizations where the interaction is of short duration. In essence, open EDI isthe process of doing EDI without the upfront trading partner agreement that is currently signedby the trading partners before they commence trying to do business by EDI.

E – Commerce Application

Sales Promotion and Advertising is one of the major activities of any Marketing Function in any business. Sales promotion and advertising is always drawn up based on the sales strategy combined with the nature and composition of the market. Segmentation of market and analysis of consumer behaviour and Product are also become easier in E-Commerce.

Sales Promotion

1. The dollar promo

The dollar promotion refers to a certain dollar amount that you offer shoppers. This can be either an amount off a total (give X amount off), in the form of a credit (give away X amount to shop at your store), or a free gift (give a gift to the value of an x amount). This is an ideal offer for online stores needing tighter control over their budgets and profit margins. To find the ideal balance between what you can afford and what will draw in potential customers, A/B test a few offers until you find just the right dollar amount.

2. The % promo

Percentage discounts are one of the most common types of sales promotions, whereby merchants offer a certain percentage off a total order amount. Some good examples of when to offer these types of promotions include: to encourage first-time shoppers, to promote seasonal offers, or when you have excess stock. The amount of percentage you offer should be based your profit margins and can be anywhere from five to over 50 percent. Again, it's important to test your promotions first to see which percentage works best for your target shoppers and to find your discount sweet spot.

3. The combo promo

The combo promotion is when you offer a certain percentage off a dollar amount; just as in the above example. With this promo, you would encourage shoppers to spend more by dangling discounts on sales over a certain amount spent. This is a great option for businesses with lower profit margins or for products with lower sale prices, to encourage a higher spend.

4. The giveaway promo

A giveaway promotion, or contest, is a tried-and-tested promo method that wins every time. Not only does it build your database and reach, but offers online stores big brand exposure. This was proven in our giveaway case studywhere one of our merchants, Keysocks, was able to gain 10,000 emails and 5,000 followers from just one promotion. That is 15,000 potential new customers who now receive their promotional news straight to their

inboxes and who are engaging with them through Instagram—15,000 potential customers who they can now upsell to for the cost of one prize.

5. The social promo

Combining social media and sales promotions is an awesome way to build your community while converting traffic into dollars. Offering exclusive discounts for shoppers if they like or follow your page on Facebook, Twitter, or Instagram ensures that you net as many passing site visitors as you can. Growing your communities results in a bigger audience of fans that you can engage with and upsell too. This promo has big appeal with site users as they feel it's very little "work" for big rewards. Don't take our word for it, check out our previous case study where a giveaway was used to gain 1,000 Instagram followers in just one month.

6. The free shipping promo

Who doesn't love free stuff? You only have to see which merchants are killing it, to know that free shipping drives sales in a big way. It has huge appeal to all kinds of shoppers who, when presented with free shipping options, tend to spend more. But of course, it all depends on whether free shipping can be worked into your cost structure without hurting your profit margins.

7. Sweepstakes

The benefit of a sweepstakes is that it attracts attention, gets you noticed and provides a forum to position your product in a unique way. Identifying a prize that accentuates a product benefit, or unique attribute, is where you need to focus your creative effort. Social Media platforms like Facebook and Twitter have established their own set of rules for running promotions. One way to get your sweepstakes created and communicated across all social media platforms is to use the services of online sweepstakes companies.

8. Contest

Contest requires that some type of skill be used to enter. This can take many forms. A simple contest execution is to have the viewer select the right answer from a choice of 2

or more answers to enter.More complex forms can be to produce and submit a video, find a hidden cache in a geocaching competition and anything in between.The creativity and positioning of the contest challenge depend on why you want to engage a consumer in an activity. The creativity of the challenge and the positioning of the contest all depends on *why* you want to engage a consumer in an activity.There are many great service companies and apps available to set up a contest, track performance, manage social sharing, and to perform other services.

9. Promo Codes and Coupons

Promo codes and online coupons are used to offer percentage off or cash discounts for your ecommerce store.Promoting promocodes is an excellent way to drive business to your ecommerce store. Setting up promocodes is easily done through an online store account with your web hosting company.Offering partners and affiliates a unique promo code for their audience increases your audience. If you are able to provide content for other sites and mention your promocodes or coupons, or link them to your current offers, it a good way to establish authority and increase keyword searches for your product.

10. Online Sampling

Social sampling campaigns builds targeted social networks to create media opportunities, increased customer engagement, and create a data base.Having customers register to receive an online sample may seem like a costly proposition.However, if you are launching a new to market product, or something that is so different people need to try it to believe it, online samples may be an option to jump start sales.Social sampling, as it's called, allows you to both leverage and build your social networks to create free media opportunities, increase engagement and create a data base. Capturing customer information and building a customer profile may be some of the best outcomes of this technique.

11. Early Bird Pricing

Early purchase discounts for a limited time is a great motivator, providing your audience is drawn in by your content and topic.Early bird admission or ticket sales strategies are popular for fee based events, seminars and conferences.Setting up a reasonably

discounted price, for a limited time and/or quantity of ticket is a great motivator, providing your audience is drawn in by your content and topic. You can also use this concept to offer pre-launch sales to select customer segments, encourage pre-season sales or offer close-out pricing for a limited time.

Advertising

When it comes to the E Marketing strategy, the need for online advertising remains the same as it is for the conventional sales. To be able to attract the target audience and to connect with them, you will need to engage in online promotional activities. There are several types of online promotional activities that you can try out.

1. Banners

One of the most popular ways of getting into online promotion is by using 'Online Ad Banners'. When you surf on the net what strikes you and attracts your attention is the online banner. There are many more promotional activities like Internet newsgroups, Email broadcasts, Social Media Networking, Internet mailing list, sponsorship of online chats, electronic press release distribution etc. The banner space can be bought on the major search engines. Ad space can be bought on 'Pay per Click' method which makes it cost economical. Banners are also traded by many of the websites who exchange the banner space with other websites in their network. The banners would need to be catchy and attractive enough to make the customer to click and visit your Company website.

2. Blogs

Blogs create a community of likeminded people and indirectly promote the products and services by building brand awareness and building a buzz around the products.

3. News Groups and Mailing lists

News groups and mailing lists involve posting messages about the chosen topics to the interested groups. Using mailing lists you can reach out to your customers with customized messages and communication. You can broadcast your newsletters; keep your prospective customers informed of the sales promotions and online fliers too. Several search

providers build mailing directories and provide services of distributing promotional materials and emails for clients. Software are also used to build mailing lists and directories of email addresses and interested users.Most of the interest users are used to receiving 'spam' mails. For some it has become a hate word too. Spam is a method of sending mails to millions of people using electronic mailing list. This is purely unsolicited mails. Such spam mails flood the inbox of users who find it a bother to go through unsolicited mails and happen to delete the mails without going through them. But then if the information is presented in a very interesting way and it manages to catch the attention of the users, the purpose of the mails will be successful. When compared to other modes of online promotions, this method turns out to be the most cost effective way.

Segmentation

Segmentation means dividing your audience into subgroups based on a characteristic or behavior. There's no end to this process: your customer database can be sliced and diced every which way, but your best segments will be unique, stable, and large enough to to be measurable.There's no shortage of marketing technology out there to help you segment and personalize your message, but your strategy doesn't have to be expensive. A segmentation strategy should be unique to your company's goals and audience types, so don't consider the list below a one-size-fits-all segmentation plan. Market segmentation allows you to better personalize your message.

Segments in E-Commerce

Brick-and-Mortar versus Digital-Only

By segmenting brick-and-mortar versus digital-only customers, you'll start to learn what specifically resonates with each audience subgroup.The digital-only audience might share key similarities with your in-store audience (that's where a Facebook lookalike audience might come into play). The message itself, however, should differ.

Engaged versus unengaged

A few might faithfully open every email newsletter you send. A few others might consistently ignore every email you send. Others will fall in between, across the wide

spectrum of user consumption habit.MailChimp, to use a common example, gives you a number of segmentation options, including the ability to create segments of subscribers who have:

- opened any or all of the last five campaigns
- not opened any or all of the last five campaigns
- not clicked any of the last five campaigns

Using the second option above, your next campaign can target unengaged customers, and you can move forward confidently knowing that they didn't consume any of the previous content you shared with them.

One-off versus repeat customers

When you track the frequency with which your customers shop with you, you can segment them into one-off, repeat, or loyal customers, as well as non-customers.In doing so, you can measure the efficacy of your content against each one of those segments. Thus can learn from the data and apply it to future marketing efforts.

If a piece of content in your next email campaign produces a higher-than-expected click rate from non-customers, then you can use this content elsewhere to drive engagement from other potential customers.

Product versus Product

With segmentation, you can create groups of people based on their interest in products.Segmenting your audiences by product interest will make you more likely to succeed when your content reaches a potential customer a second, third or fourth time.

High spenders

Every online shop should have some customers that spend a lot more than the average. They can either shop very often or they make large orders. Either way, they're valuable for you because they make you far better profit than others who cost the same to acquire.High spenders should be treated probably best of all customers and kept for as long

as possible. Your communication and offers for them should show appreciation and make their shopping experience pleasant and convenient.

Cart Abandoners

Shoppersselect some product for purchase, later, got interrupted and leave the web without making the order because they decided they didn't want the product / offer. By using the interest they showed in a certain product or category, you can add more related items in the same email and give them more options.

Coupon lovers

Customers who only buy with a coupon need never to pay full price. Keep sending them coupons, but cut it back for people outside that group. The idea is not to devalue your products so much with constant promotions while keeping the sales coming from price-sensitive people.

Thrifty shoppers

Some people like the big spenders buy a lot in one sitting, while others prefer coming often, but buying only as much as they need at the moment.

Loyals

One customer segment is the dream of every seller. These people bring you a nice, steady revenue flow. They obviously trust your store and probably even recommend it to others because it's their go-to place for this type of products.

Trendy

This segment is full of potential because they shop the new collections and convert from new product offers.

Some bases for Segmentation

Demographic Segmentation

Customer Life time Value

Customer habits

Preferred Product Category

Intention to Purchase

Level of Attainment in purchase process

Stage in Customer Ladder

Device used for E-Commerce

Source of Access

Location of the Customer

Consumer Behaviour Analysis

Consumer behaviour analysis represents one development within the behaviour-analytic tradition of interpreting complex behaviour, in which a specific conceptual framework has been proposed. Consumer behaviour is studied more in sectors which are very concentrated and competitive. FMCG, consumer durables, retail and e commerce are such sectors where many people are employed just to analyse consumer behaviour and influence consumer behaviour. The primary importance of consumer buying behaviour lies in the fact, that you can know how the consumer is going to behave. There are various reasons the consumer is buying the product.

Importance of consumer buying behavior

Increase revenue – The importance of consumer buying behavior lies in the fact, that we can improve our sales figures when we study the customers. We can alter the way we sell our products depending on the ways that customers buy them.

Brand equity – Why are brand restructuring or image restructuring exercises done in top companies? It is with consumer insight that the brand decides it needs to restructure itself, to change its perception in the mind of people, thereby getting higher turnovers. This too, can happen when you analyse consumer behavior.

Product portfolio – Continuous observation of consumer behavior can enable you in finding gaps in your product portfolio, which can in turn help you launch new products to the ultimate satisfaction of your customers.

Market trends – As the market trend shifts, a consumer analysis will be the first indicator of the same. The recent shift towards environment friendliness and health food is a trend observed.

Segmentation and targeting – Your current customers are a clear indication of who your future customers are going to be. If my current customers are 50% impulsive, then the future customers too will be impulsive. Segmentation and targeting becomes easier when you are observing consumer behavior.

Forecasting – Whether it be demand forecasting or sales forecasting, both of them are possible and therein lies the importance of consumer buying behavior. The company will not waste it resources for a product which is going to sell in summers, because the company knows that the customers are not going to buy it in winters. Hence by analysing consumer buying behavior, the company has saved warehousingcosts, manufacturing costs and marketing costs as well. In essence, forecasting as well as proper utilisation of resources is achieved.

Competitive analysis – One of the most important reasons to study consumer behavior is to find out which competitor's products the customer is buying. What are the attributes and the features that the customer is valuing above your company? And can you cover those gaps to take away these customers from competition? All this can be answered only by studying consumer buying behavior.

Above are some of the reasons that studying consumer buying behavior is important for any company.

Analysing consumer behaviour

Analysing consumer behaviour is difficult because there are many factors which influence consumer's behaviour.

The questions like the ones given below may help the company to build a consumer profile, and may also determine the different types of customers which buy the product of the company and the influences which make them buy.

Who buys your products and services?

Who makes the decision to buy the product?

Who influences the decision to buy the product?

How is the purchase decision made?

Why does the customer buy?

Why does the consumer prefer one brand over another?

Where do customers go to buy the brand?

When do customers buy a product?

What is the product's perception?

What social factors influences the purchase decision?

What is the role of consumer's lifestyle in his behaviour?

What role does personal or demographic factor play in purchase decision?

PLC Analysis

The concept of product life cycle (PLC) concerns the life of a product in the market with respect to business/commercial costs and sales measures. The product life cycle proceeds through multiple phases. PLC management makes the following three assumptions.

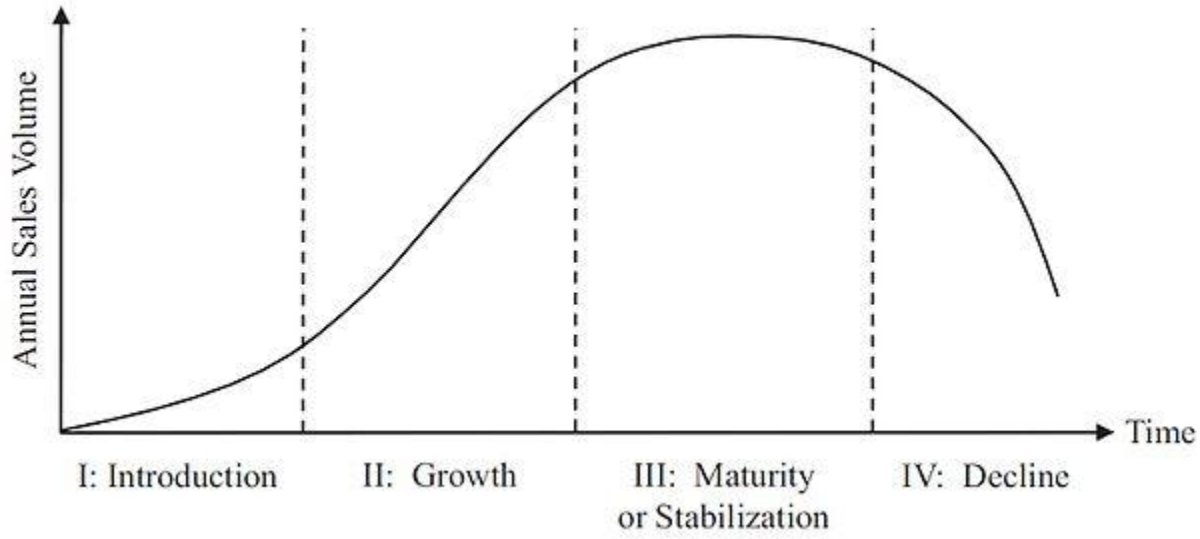
- Products have a limited life and thus every product has a life cycle.
- Product sales pass through distinct stages, each posing different challenges, opportunities, and problems to the seller.
- Products require different marketing, financing, manufacturing, purchasing, and human resource strategies in each life cycle stage.

Once the product is designed and put into the market, the offering should be managed efficiently for the buyers to get value from it. Before entering into any market complete analysis is carried out by the industry for both external and internal factors including the laws and regulations, environment, economics, cultural values and market needs. Product life cycle is a concept and this term 'product life cycle' is associated with every product that exists, however, due to a limited shelf life the product has to expire. From the business perspective, as a good business, the product needs to be sold before it finishes its life. In terms of profitability, expiry may jolt the overall profitability of the business therefore there are few strategies, which are practiced to ensure that the product is sold within the defined period of maturity.

Introduction Stage

This is the stage in which the product has been introduced first time in the market and the sales of the product starts to grow slowly and gradually and the profit received from the product is nominal and non-attained. The market for the product is not competitive initially and also the company spends initially on the advertisement and uses various other tools for promotion in order to motivate and produce awareness among the consumers, therefore generating discerning demands for particular brand. The products start to gain distribution as the product is initially new in the market and in this stage the quality of the product is not assured and the price of the product will also be determined as low or high.[2]

1. costs are very high
2. slow sales volumes to start
3. little or no competition
4. demand has to be created
5. customers have to be prompted to try the product
6. makes little money at this stage



Growth Stage

In the growth stage, the product is present already in the market and the consumers of the products are habitual of the product and also there is quick growth in the product sales as more new and new customers are using and trying and are becoming aware of the product. The customers are becoming satisfied from the product and they bought it again and again. The ratio of the product repetition for the trial procurement risen and also at this level, the competitors have started to overflow the market with more appealing and attractive inventions. This helps in creating increased competition in the market and also results in decreasing the product price.

1. costs reduced due to economies of scale
2. sales volume increases significantly
3. profitability begins to rise
4. public awareness increases
5. competition begins to increase with a few new players in establishing market
6. increased competition leads to price decreases

Maturity Stage

In maturity stage, the cost of the product has been decreased because of the increased volume of the product and the product started to experience the curve effects. Also, more and more competitors have seen to be leaving the market. In this way very few buyers have been left for the product and this results in less sales of the product. The decline of the product and cost of attaining new buyers in this level is more as compare to the resulted profit. The brand or the product differentiation via rebating and discounts in price supports in recalling the outlet distribution. Also, there is a decline in the entire cost of marketing through enhancing the distribution and promotional efficiency with switching brand and segmentation.

1. costs are decreased as a result of production volumes increasing and experience curve effects
2. sales volume peaks and market saturation is reached
3. increase in competitors entering the market
4. prices tend to drop due to the proliferation of competing products
5. brand differentiation and feature diversification is emphasized to maintain or increase market share
6. industrial profits go down

Decline stage

In this stage, the profit as well as the sales of the product has started to decline because of the deletion of the product from the market. The market for the product in this stage, started to show negative rate of growth and corroding cash flows. The product, at this stage may be kept but there should be less adverts.

1. costs become counter-optimal
2. sales volume decline
3. prices, profitability diminish

4. profit becomes more a challenge of production/distribution efficiency than increased sales

Unit 4

E-Security

Companies are doing more and more business on the Web as interactions become faster and less expensive. And while gyrations on the stock market and the crash of many dot.com firms have distracted investors, there will be no retreat from e-business. The Web's new efficiencies, however, bring more security concerns.

The basic needs of Web and regular security are the same. You need to know that users, internal or external,

- are who they say they are (authentication),
- have permission to do what they want (authorization),
- are accessing information that cannot be altered or read in transit (data integrity and encryption),
- can be held responsible for their actions (accountability), and
- can make agreements with sites that are legally enforceable (notarization).

And, of course, all these functions must be easy to manage and transparent to the end user.

Doing business over the Web consists of a chain of events; various products and techniques are used to secure the parts of the chain. With that fact in mind, below are descriptions of the main categories of security needs.

Authentication comes in two major levels: strong and standard. A "personal identifier" (name) and something you know (password) are the standard level. If a higher level of security than passwords is needed, people can be required to "have something" as well as "know something". The have-something category includes biometrics (e.g., fingerprints), tokens, smartcards, and a private or public key infrastructure (PKI) key.

Solutions for authentication usually vary in a large organization; senior accountants, for example, need to access sensitive financial data, but a salesperson should not have access to the same data. Individuals accessing highly sensitive data need strong authentication, while standard authentication works for other employees. Technologies supporting flexible authentication and authorization are readily available.

Authorization also needs to be established for the different parties with whom you do business. To return to the home analogy; just because you have invited someone into your house does not mean that the person has the right to examine your tax returns or read your love letters. Authorization provides the same controls for digital environments. You may be collaborating with company A on a business deal but competing with them on a different contract. Obviously, you would not want all your information to be available to them. In this case, only people authorized according to your business rules should be able to access the relevant information.

In addition, access controls can limit resources down to individual records in a database and work with authentication. Within large databases, groups or individuals can be granted access to different information using tools that offer fine-grained access control. Different levels of authentication may be demanded on the basis of what information is accessed. Senior employees may not need to pass stringent security to see the company's annual report, but they may later be asked to pass higher security to see unreleased financial information. These kinds of flexible authorization are necessary for e-commerce.

Data integrity means that data are not changed in transit. Generally, a *hash* is made of the data, and an automatic comparison is made between the expected hash and the received one. A hash is the result of transforming a string of characters into a fixed-length value or key that represents the original data. Hashes can be compared quickly, and because even small alterations change the hash value, the comparison shows that data integrity has not been maintained. Whether the change is small and inadvertent or large and significant, a difference is registered and the data resent.

Encrypting messages prevents eavesdropping. Reliable, efficient encryption schemes are obviously necessary for any business using the Web. Private or Public key infrastructure (PKI) combines encrypting data with strong authentication and is the basis of securing most e-business transactions. PKI is a two-key system. One key, the public key, is available to everyone and can be used to encrypt data but not access it. The matching private key, kept by only one person, is used to unlock the data.

PKI is highly scalable, but certificatemanagement is cumbersome (certificates associate each public key with an individual), and so more-limited uses of salient parts of PKI technologies are widespread. SSL, the de facto encryption standard for Internet transactions, uses parts of PKI technology, as do virtual private networks (VPNs), which establish secure point-to-point pathways through the Web and other public networks. Internet protocol security (IPSec) helps implement VPNs and extends security services to multiple Internet protocols, parties, security domains, and types of platforms.

Accountability is often taken lightlyby people when they are on the Internet; however, it is important in an e-business environment. Audit trails are used to track important changes in order to make users accountable. However, audit trails must be as flexible as the business processes that they service. That is, audit trails must be configurable, allowing administrators to focus attention on regions that are either more valuable or more prone to attack.

People who conduct business over the Internet may also need proof of their actions, as, for example, when they are signing a contract or making a trade, so that they cannot later deny that they authorized the action (non-repudiation). PKI supports such digital signatures. For additional security, the signatures can be time-stamped.

Security vendors have made great progress in developing tools that extend your protected network into the open e-commerce world; detect would-be intruders; hold users accountable for their actions; stop malicious code encrypted in messages from reaching their targets; and letting you, the owner of the Web site or application server, decide who gets to

access what. And best of all, these procedures and tools are transparent to your users. Today, security solutions enable your people to work better and faster than ever before.

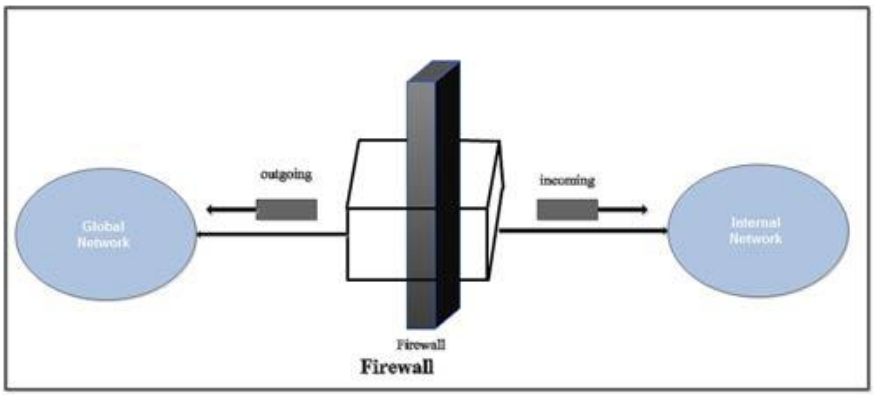
Firewall

A **firewall** is a network security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules. A firewall typically establishes a barrier between a trusted internal network and un-trusted outside network, such as the Internet.

Computer security borrowed the term firewall from firefighting and fire prevention, where a firewall is a barrier established to prevent the spread of fire.

Firewalls protect your network by permitting only specified traffic to enter it from the outside (from the Internet, for example). In other words, firewalls are a type of access control for networks. Because of the Internet, firewalls have come to play an important role in modern business technologies. In large organizations, firewalls also separate internal networks from each other, keeping an intruder in one network from gaining access to another or preventing unauthorized access by employees to certain files.

Firewalls divide the information technology world into two parts: the inside, trusted zone and the outside, un-trusted zone. They function like locks on doors and windows, keeping uninvited folks out. Like physical locks, firewalls must be maintained. The best lock in the world will not protect your house if you forget to lock it or if you leave a key under the doormat. If your business is to thrive, it is important that firewalls not block needed traffic and frustrate your users. It is hard to bring groceries into your house if the door locks behind you every time it closes. To work effectively, firewall rules and policies must support your business.



Firewalls are often categorized as either **network firewalls** or **host-based firewalls**. Network firewalls filter traffic between two or more networks; they are either software appliances running on general-purpose hardware, or hardware-based firewall computer appliances. Host-based firewalls run on host computers and control network traffic in and out of those machines.

Packet filter firewall

It uses a set of rules to determine whether outgoing or incoming data packets are allowed to pass through the firewall. For example, we can, as a rule, specify IP addresses of sending devices such that packets from these IP addresses are not allowed to enter the network. The Firewall would stop them from entering. A packet filter firewall is the simplest type of firewalls which operates at data link and network layers of the OSI network model.

Circuit level firewall

It is quite similar to the packet filter firewall. It also works on the basis of a set of rules for filtering packets but operates at the transport layer of the OSI Model so has greater functionality. As a rule, the higher the layer of OSI model where a firewall operates, the more sophisticated is the firewall. It can make packets sent from internal network to a destination outside the firewall appear as if they originated at the firewall. Thus information regarding hosts on the internal network remains secret. It can also determine whether TCP/IP connection between a host and a machine outside firewall has been properly established. Thus it can cut off any connection which has been hijacked by a hacker trying to pass through the firewall.

Application gateway firewall

It operates at application layer of the OSI Model. It uses strong user authentication to verify identity of a host attempting to connect to the network using application layer protocols such us FTP. In contrast to packet filter firewall, it filters the requests rather than packets entering/leaving the network. It can block any outgoing HTTP or FTP requests. It can prevent employees of a company inside a firewall from downloading potentially dangerous programs from the outside. In other words, this type of firewall is used to control connections thus employees of a company can be restricted from connecting to certain web sites. We can combine circuit level capabilities with application gateway services to form Hybrid type of a firewall.

Proxy server

A proxy server sits between an internal trusted network and the un-trusted network, that is, internet. Mainly, it can do three things: An http request from the browser goes to proxy server. It can affix its own IP address instead of IP address of the requesting machine; thus, it hides the information of the host. It downloads the requested page itself and afterwards supplies it to the user. It can also act as a firewall filtering requests for certain web pages.

An important job it can do is to speed up the processing of http requests by caching web pages. Caching means that it can store the requested web pages in its memory (cache memory) for a certain period. The advantage of caching is that for subsequent web page requests the time of supply of the web pages is reduced. Instead of sending the request to actual web server, the proxy server can quickly supply the web page stored in its cache memory, thus, it saves the time of downloading the page.

Issues in Firewall

There are many security issues, however, that firewalls cannot help with. For example, they cannot restrict undesired behavior by your employees, whether negligent or intentional, on your network. To the firewall, each insider is equal. Nor can firewalls protect your network from viruses that are brought to it on floppies or tunneled. Tunneling makes a

secure connection over the Internet between remote clients and Web servers (or private networks). Malicious or buggy code can enter a network in this manner. Other security processes, such as virus protection and access control, take care of these situations.

Viruses

Viruses are software that is designed to specifically damage a computer. It spreads from program to program and software to software. If a virus has been planted into a website this will cause some problems and complaints from their customers as whenever they enter the website, the virus will then hop onto their computer causing damage to the computer. Once this happens the customers will then complain and will then refuse to use the website again and warn off other potential customers. The e-commerce will then begin to lose customers and then money. Without money the e-commerce can then no longer advertise and so will eventually be forgotten and then out of business. In order to prevent this, the e-commerce website should be sure to download an anti-virus program in order to protect their customers and their business.

Malware, Viruses, Spyware, and Cookies

Malware: "Malware" is short for malicious software and used as a single term to refer to virus, spy ware, worm etc. Malware is designed to cause damage to a stand-alone computer or a networked personal computer. So wherever a malware term is used it means a program which is designed to damage your computer it may be a virus, worm or Trojan.

Virus: Virus is a program written to enter to your computer and damage/alter your files/data. A virus might corrupt or delete data on your computer. Viruses can also replicate themselves. A computer Virus is more dangerous than a computer worm as it makes changes or deletes your files while worms only replicates itself without making changes to your files/data.

Examples of virus areW32.Sfc!mod, ABAP.Rivpas.A, Accept.3773

Viruses can enter to your computer as an attachment of images, greeting, or audio / video files. Viruses also enters through downloads on the Internet. They can be hidden in free/trial software or other files that you download.

So before you download anything from the internet, be sure about it first. Almost all viruses are attached to an executable file, which means the virus may exist on your computer but it actually cannot infect your computer unless you run or open the malicious program. It is important to note that a virus cannot be spread without a human action, such as running an infected program to keep it going.

Spyware: Spyware is a type of program that is installed with or without your permission on your personal computers to collect information about users, their computer or browsing habits tracks each and everything that you do without your knowledge and send it to remote user. It also can download other malicious programs from internet and install it on the computer.Spyware works like adware but is usually a separate program that is installed unknowingly when you install another freeware type program or application.

Trojans: A Trojan horse is not a virus. It is a destructive program that looks as a genuine application. Unlike viruses, Trojan horses do not replicate themselves but they can be just as destructive. Trojans also open a backdoor entry to your computer which gives malicious users/programs access to your system, allowing confidential and personal information to be theft.Example: - JS.Debeski.Trojan

Trojan horses are broken down in classification based on how they infect the systems and the damage caused by them. The seven main types of Trojan horses are:

- Remote Access Trojans
- Data Sending Trojans
- Destructive Trojans
- Proxy Trojans
- FTP Trojans
- Security software disabler Trojans
- Denial-of-service attack Trojans

Worms: Worms are malicious programs that make copies of themselves again and again on the local drive, network shares, etc. The only purpose of the worm is to reproduce itself again and again. It doesn't harm any data/file on the computer. Unlike a virus, it does not need to attach itself to an existing program. Worms spread by exploiting vulnerabilities in operating systems. Examples of worm areW32.SillyFDC.BBY, Packed.Generic.236, W32.Troresba.

Due to its replication nature it takes a lot of space in the hard drive and consumes more CPU uses which in turn makes the pc too slow also consumes more network bandwidth.

Different type of Virus

File Virus: This type of virus normally infects program files such as .exe, .com, .bat. Once this virus stays in memory it tries to infect all programs that load on to memory.

Macro Virus: These type of virus infects word, excel, PowerPoint, access and other data files. Once infected repairing of these files is very much difficult.

Master boot record files: MBR viruses are memory-resident viruses and copy itself to the first sector of a storage device which is used for partition tables or OS loading programs .A MBR virus will infect this particular area of Storage device instead of normal files. The easiest way to remove a MBR virus is to clean the MBR area.

Boot sector virus: Boot sector virus infects the boot sector of a HDD or FDD. These are also memory resident in nature. As soon as the computer starts it gets infected from the boot sector. Cleaning this type of virus is very difficult.

Multipartite virus: A hybrid of Boot and Program/file viruses. They infect program files and when the infected program is executed, these viruses infect the boot record. When you boot the computer next time the virus from the boot record loads in memory and then start infecting other program files on disk

Polymorphic viruses: A virus that can encrypt its code in different ways so that it appears differently in each infection. These viruses are more difficult to detect.

Stealth viruses: These types of viruses use different kind of techniques to avoid detection. They either redirect the disk head to read another sector instead of the one in which they reside or they may alter the reading of the infected file's size shown in the directory listing. For example, the Whale virus adds 9216 bytes to an infected file; then the virus subtracts the same number of bytes (9216) from the size given in the directory.

Adware

Generically adware is a software application in which advertising banners are displayed while any program is running. Adware can automatically get downloaded to your system while browsing any website and can be viewed through pop-up windows or through a bar that appears on a computer screen automatically. Adware are used by companies for marketing purpose.

Tracking cookies

A cookie is a plain text file that is stored on your computer in a cookies folder and it stores data about your browsing session. Cookies are used by many websites to track visitor information A tracking cookie is a cookie which keeps tracks of all your browsing information and this is used by hackers and companies to know all your personal details like bank account details, your credit card information etc. which is dangerous.

Spam

Spamming is a method of flooding the Internet with copies of the same message. Most spam are commercial advertisements which are sent as an unwanted email to users. Spam are also known as Electronic junk mails or junk newsgroup postings. These spam mails are very annoying as it keeps coming every day and keeps your mailbox full.

Misleading applications

Misleading applications misguide you about the security status of your computer and shows you that your computer is infected by some malware and you have to download the tool to remove the threat. As you download the tool it shows some threats in your computer

and to remove it you have to buy the product for which it asks some personal information like credit card information etc. which is dangerous.

Security Protection and Recovery

Hacking

Hacking is gaining access to unauthorized systems and resources. This allows the hacker to change details on the website and enable it to sound as if the website owner had done this. When a website has been hacked, the e-commerce will be forced to shut down the website until the details have been changed and security updated. This will then affect their customers as this will then prevent them from using the website in which could cause inconvenience for example, checking flight times. If this was to happen often, customers will then begin to give up on the website and take their searches elsewhere leaving the e-commerce with a loss of customers and therefore losing money. If this was to happen, this would then begin to affect the e-commerce supplier as they will no longer use the website for their searches and therefore promotion would become a waste of money and so they will eventually run out of business being forced to shut down. For good this time, in order to prevent this, the website should keep their security updated at all times and possibly change their access password often to avoid any knowledge of the password getting out and keep the amount of people that know this as low as possible.

Viruses

Viruses are software that is designed to specifically damage a computer,spreading from program to program and software to software. If a virus has been planted into a website this will cause some problems and complaints from their customers as whenever they enter the website, the virus will then hop onto their computer causing damage to the computer. Once this happens the customers will then complain and will then refuse to use the website again and warn off other potential customers. The e-commerce will then begin to lose customers and then money. Without money the e-commerce can then no longer advertise and so will eventually be forgotten and then out of business. In order to prevent this, the e-commerce website should be sure to download an anti-virus program in order to protect their customers and their business.

Identity Theft

Identity theft is when a person gets hold of another person's details and uses them as their own to do what they want, claiming to be that person. On websites such as banking websites this can be a potential problem if not kept secure enough. If a customer's identity is stolen, the thief could then use their bank details to claim their money or use it to buy what they want and claim to be that person and so claim the money as theirs. If this was to happen the customer would be forced to shut down their bank completely when realized and will most likely decide to change banking companies and this will then reflect badly on the e-commerce reputation. This could then lead to the bank company getting in a lot of trouble for the lack of security breach placed on their website, causing extra stress and devastation among their customers. They may then be forced to close the website down whilst they update security which will then cause inconvenience and the company will then gain a very bad reputation and new users will then choose other companies and depending on the circumstances some existing customers could switch. To prevent this from happening, the website should be sure to update their security, changing security questions and passwords often.

Firewall

Firewall can be hardware and software. It is a security system that controls what goes in and out of a system. It is designed to stop any unauthorized access from using a private network. Firewall is necessary because it can help to prevent any unwanted internet users from using the private networks which are connected to the internet. Firewalls can slow down the server speed as firewalls are designed to check for any potential danger and decide whether it is safe or not before giving you access to the page. Due to the fact that firewalls can slow down your server this can then slow down an e-commerce website; that is it may take a little extra time for your customers to gain access to the page. This could go in two directions. The customer could be impatient and decide not to use the website because of the speed to gain access to it or could gain more customer trust, putting their mind at rest that they are safe from any potential danger. Firewalls will keep the website safe and secure

meaning that e-commerce supplier can relax a little bit knowing their website is safe and therefore their customers are safe.

Strong Passwords

Strong passwords are essential to a website. Keeping strong passwords can prevent hacking. A strong password will consist of random words that have no relation to you or anyone else and including lots of random numbers which will be impossible to just guess. When you have a customer signing up to your website, you should be sure to ensure they have strong passwords before access. This will help to prevent them from hacking and identity theft meaning the customer can then roam the website safe and secure. Not only customers but for the e-commerce supplier themselves as this will keep hackers out of their websites where they can then prevent viruses and identity theft and vandalism on their website meaning both them and their customers are safe.

Alternatives

A basic authentication method is when you try to hit a URL for a web application that is protected and you are unauthorized, there will be a window which pops up which will request your username and password which is then sent to the website to check up on as to whether it is correct or not. If the password and username match then you will be authorized and have access and if not then you will be denied access.

Examples of alternative methods:

Face Recognition: Face recognition would allow the computer to scan your face and remember it so that only you can access the website or computer as it only recognizes your face and no one else's.

Fingerprint: Everybody's fingerprints are different. Using a finger scanner will allow only the selected people with their installed finger prints access. It will scan your finger every time you want access.

Eye iris Recognition*:* Using eye iris recognition is also another safe bet as it goes by your eyes. This means that only you with your eyes can access the computer or website.

These methods are the most safe, but also the hardest. You have to make sure to be exact when using these other options. For face recognition you have to be sure to keep the same emotion of your face when logging in. For the fingerprint, you must keep your finger in the same angle and also the same finger. You cannot change the finger every time. Finally eye iris recognition,when you are wearing glasses or contact lenses these can interfere with the machine so you must be sure to keep them the same.

SSL

SSL is short for Security Socket Layer. It is a type of protocol that is used to transmit private documents using the internet. SSL uses a cryptographic system in which uses two keys to encrypt data; a private key and a public key. There are layers on a server that SSL has to go through before reaching the requested data. The first layer is the outer layer. This is where the high level protocols make bay such as HTTP. Depending on the client request, it decides which outer layer is used. The outer layer high protocols then process the request through the SSL. If the client requests a non-secure connection then it passes through the TCP/IP layer and the server application or data. If the client requests a secure connection the SSL layer initiates the secure connection to process to begin.

HTTPS

HTTPS is short for Hypertext Transfer Protocol Secure. HTTPS is used to determine how a message is formatted, how it is transmitted and what precautions web servers and browsers should take. HTTPS is a request response protocol which means for example a Web browser initiates a request to a server, typically by opening a TCP/IP connection then the request itself comprises of a request line, a set of request headers, and an entity.

The server sends a response that comprises of a status line, a set of response headers, and an acknowledgement.

RSA Certificates

This is short for Ron Rivest, Adi Shamir and Leonard Adleman. The RSA certificate is a professional program that offers professionals in technology the knowledge, skills and credentials that enables them to keep up with security systems within an

enterprise. Certificates are basically just an implementation of digital signatures. One certificate is used to sign the data using a private key, and a corresponding verification certificate is given to the user along with the signature and the data. The user uses the verification certificate to verify that the file matches its signature.

Encryption

In cryptography, **encryption** is the process of encoding a message or information in such a way that only authorized parties can access it. Encryption does not itself prevent interference, but denies the intelligible content to a would-be interceptor. In an encryption scheme, the intended information or message, referred to as plaintext, is encrypted using an encryption algorithm – a cipher – generating cipher text that can only be read if decrypted. For technical reasons, an encryption scheme usually uses a pseudo-random encryption key generated by an algorithm. It is in principle possible to decrypt the message without possessing the key, but, for a well-designed encryption scheme, considerable computational resources and skills are required. An authorized recipient can easily decrypt the message with the key provided by the originator to recipients but not to unauthorized users.

History of encryption

The word *encryption* comes from the Greek word kryptos, meaning hidden or secret. The use of encryption is nearly as old as the art of communication itself. As early as 1900 BC, an Egyptian scribe used non-standard hieroglyphs to hide the meaning of an inscription. In a time when most people couldn't read, simply writing a message was often enough, but encryption schemes soon developed to convert messages into unreadable groups of figures to protect the message's secrecy while it was carried from one place to another. The contents of a message were reordered (transposition) or replaced (substitution) with other characters, symbols, numbers or pictures in order to conceal its meaning.

In 700 BC, the Spartans wrote sensitive messages on strips of leather wrapped around sticks. When the tape was unwound the characters became meaningless, but with a stick of exactly the same diameter, the recipient could recreate (decipher) the message. Later, the Romans used what's known as the Caesar Shift Cipher, a monoalphabetic cipher in which

each letter is shifted by an agreed number. So, for example, if the agreed number is three, then the message, "Be at the gates at six" would become "eh dwwkhjdwhvdwvla". At first glance this may look difficult to decipher, but justapositioning the start of the alphabet until the letters make sense doesn't take long. Also, the vowels and other commonly used letters like *T* and *S* can be quickly deduced using frequency analysis, and that information in turn can be used to decipher the rest of the message.

The middle ages saw the emergence of polyalphabetic substitution, which uses multiple substitution alphabets to limit the use of frequency analysis to crack a cipher. This method of encrypting messages remained popular despite many implementations that failed to adequately conceal when the substitution changed, also known as key progression. Possibly the most famous implementation of a polyalphabetic substitution cipher is the Enigma electro-mechanical rotor cipher machine used by the Germans during World War Two.

It was not until the mid-1970s that encryption took a major leap forward. Until this point, all encryption schemes used the same secret for encrypting and decrypting a message: a symmetric key. In 1976, B. Whitfield Diffie and Martin Hellman's paper *New Directions in Cryptography* solved one of the fundamental problems of cryptography, namely how to securely distribute the encryption key to those who need it. This breakthrough was followed shortly afterwards by RSA, an implementation of public-key cryptography using asymmetric algorithms, which ushered in a new era of encryption.

Use encryption

Until the arrival of the Diffie-Hellman key exchange and RSA algorithms, governments and their armies were the only real users of encryption. However, Diffie-Hellman and RSA led to the broad use of encryption in the commercial and consumer realms to protect data both while it is being sent across a network (data in transit) and stored, such as on a hard drive, Smartphone or flash drive (data at rest). Devices like modems, set-top boxes, smartcards and SIM cards all use encryption or rely on protocols like SSH, S/MIME, and SSL/TLS to encrypt sensitive data. Encryption is used to protect data in transit sent from all sorts of devices across all sorts of networks, not just

the Internet; every time someone uses an ATM or buys something online with a Smartphone, makes a mobile phone call or presses a key fob to unlock car, encryption is used to protect the information being relayed. Digital rights management systems, which prevent unauthorized use or reproduction of copyrighted material, are yet another example of encryption protecting data.

Data, often referred to as plaintext, is encrypted using an encryption algorithm and an encryption key. This process generates cipher text that can only be viewed in its original form if decrypted with the correct key. Decryption is simply the inverse of encryption, following the same steps but reversing the order in which the keys are applied.

Today's encryption algorithms are divided into two categories:

1. Symmetric Key Encryption
2. Asymmetric Key Encryption.

Symmetric Key Encryption

In symmetric-key encryption, each computer has a secret key (code) that it can use to encrypt a packet of information before it is sent over the network to another computer. Symmetric-key requires that you know which computers will be talking to each other so you can install the key on each one. Symmetric-key encryption is essentially the same as a secret code that each of the two computers must know in order to decode the information. The code provides the key to decoding the message.

The most widely used symmetric-key cipher is AES, which was created to protect government classified information. Symmetric-key encryption is much faster than asymmetric encryption, but the sender must exchange the key used to encrypt the data with the recipient before he or she can decrypt it. This requirement to securely distribute and manage large numbers of keys means most cryptographic processes use a symmetric

algorithm to efficiently encrypt data, but use an asymmetric algorithm to exchange the secret key.

Asymmetric Key Encryption

Asymmetric cryptography, also known as public-key cryptography, uses two different but mathematically linked keys, one public and one private.The private key is known only to your computer, while the public key is given by your computer to any computer that wants to communicate securely with it. To decode an encrypted message, a computer must use the public key, provided by the originating computer, and its own private key. Although a message sent from one computer to another won't be secure since the public key used for encryption is published and available to anyone, anyone who picks it up can't read it without the private key. The key pair is based on prime numbers (numbers that only have divisors of itself and one, such as 2, 3, 5, 7, 11 and so on) of long length. This makes the system extremely secure, because there is essentially an infinite number of prime numbers available, meaning there are nearly infinite possibilities for keys. One very popular public-key encryption program is **Pretty Good Privacy (PGP)**, which allows you to encrypt almost anything.

To implement public-key encryption on a large scale, such as a secureWeb server might need, requires a different approach. This is where**digital certificates** come in. A digital certificate is basically a unique piece of code or a large number that says that the Web server is trusted by an independent source known as a **certificate authority**. The certificate authority acts as a middleman that both computers trust. It confirms that each computer is in fact who it says it is, and then provides the public keys of each computer to the other.

RSA is the most widely used asymmetric algorithm, partly because both the public and the private keys can encrypt a message; the opposite key from the one used to encrypt a message is used to decrypt it. This attribute provides a method of assuring not only confidentiality, but also the integrity, authenticity and non-reputability of electronic communications and data at rest through the use of digital signatures.

Cryptographic hash functions

A cryptographic hash function plays a somewhat different role than other cryptographic algorithms. Hash functions are widely used in many aspects of security, such as digital signatures and data integrity checks. They take an electronic file, message or block of data and generate a short digital fingerprint of the content called a message digest or hash value. The key properties of a secure cryptographic hash function are:

- Output length is small compared to input
- Computation is fast and efficient for any input
- Any change to input affects lots of output bits
- One-way value-- the input cannot be determined from the output
- Strong collision resistance -- two different inputs can't create the same output

The ciphers in hash functions are built for hashing: they use large keys and blocks, can efficiently change keys every block and have been designed and vetted for resistance to related-key attacks. General-purpose ciphers used for encryption tend to have different design goals. For example, the symmetric-key block cipher AES could also be used for generating hash values, but its key and block sizes make it nontrivial and inefficient.

Authentication and Trust

Authentication is the act of confirming the truth of an attribute of a single piece of data claimed true by an entity. In contrast with identification, which refers to the act of stating or otherwise indicating a claim purportedly attesting to a person or thing's identity, authentication is the process of actually confirming that identity. It might involve confirming the identity of a person by validating theiridentity documents, verifying the authenticity of a website with a digital certificate,determining the age of an artefact bycarbon dating, or ensuring that a product is what its packaging and labelling claim to be. In other words, authentication often involves verifying the validity of at least one form of identification.

In computer science, verifying a person's identity is often required to allow access to confidential data or systems.

Authentication is accepting proof of identity given by a credible person who has first-hand evidence that the identity is genuine. When authentication is required of art or physical

objects, this proof could be a friend, family member or colleague attesting to the item's provenance, perhaps by having witnessed the item in its creator's possession. With autographed sports memorabilia, this could involve someone attesting that they witnessed the object being signed. A vendor selling branded items implies authenticity, while he or she may not have evidence that every step in the supply chain was authenticated. Centralized authority-based trust relationships back most secure internet communication through known public certificate authorities; decentralized peer-based trust, also known as a web of trust, is used for personal services such as email or files (pretty good privacy, GNU Privacy Guard) and trust is established by known individuals signing each other'scryptographic key at Key signing parties, for instance.

Kerberos Authentication and Trust

The Kerberos authentication protocol is a technology for single sign-on to network resources. Windows 2000 uses the Kerberos v5 protocol to provide fast, single sign-on to network services within a domain, and to services residing in trusted domains. Kerberos protocol verifies both the identity of the user and of the network services, providing mutual authentication.

When a user enters domain credentials (by user name and password or smart card logon), Windows 2000 locates an Active Directory server and Kerberos authentication service. The Kerberos service issues a "ticket" to the user. This is a temporary certificate containing information that identifies the user to network servers. After the initial interactive logon, the first Kerberos ticket is used to request other Kerberos tickets to log on to subsequent network services. This process is complex and involves mutual authentication of the user and the server to one another, but it is completely transparent to the user. (For more information about Kerberos v5 authentication, see Windows 2000 Server Help.)

Kerberos authentication reduces the number of passwords a user needs to remember, and thereby reduces the risk of identity interception. Trust relationships between domains in a forest extend the scope of Kerberos authentication to a wide range of network resources.

Key management

Key management is the name of management of cryptographic keys in a cryptosystem. This includes dealing with the generation, exchange, storage, use, crypto-shredding (destruction) and replacement of keys. It includes cryptographic protocol design, key servers, user procedures, and other relevant protocols.

Key management concerns keys at the user level, either between users or systems. This is in contrast to key scheduling, which typically refers to the internal handling of keys within the operation of a cipher.

Successful key management is critical to the security of a cryptosystem. It is the more challenging side of cryptography in a sense that it involves aspects of social engineering such as system policy, user training, organizational and departmental interactions, and coordination between all of these elements, in contrast to pure mathematical practices that can be automated.

Management steps

Once keys are inventoried, key management typically consists of three steps:

1. Exchange
2. Storage
3. Use.

Key Exchange

Prior to any secured communication, users must set up the details of the cryptography. In some instances this may require exchanging identical keys (in the case of a symmetric key system). In others it may require possessing the other party's public key. While public keys can be openly exchanged (their corresponding private key is kept secret), symmetric keys must be exchanged over a secure communication channel. Formerly, exchange of such a key was extremely troublesome, and was greatly eased by access to secure channels such as a diplomatic bag. Clear text exchange of symmetric keys would enable any interceptor to immediately learn the key, and any encrypted data.

Another method of key exchange involves encapsulating one key within another. Typically a master key is generated and exchanged using some secure method. This method

is usually cumbersome or expensive (breaking a master key into multiple parts and sending each with a trusted courier for example) and not suitable for use on a larger scale. Once the master key has been securely exchanged, it can then be used to securely exchange subsequent keys with ease. This technique is usually termed Key Wrap. A common technique uses Block ciphers and cryptographic hash functions.

A related method is to exchange a master key (sometimes termed a root key) and derive subsidiary keys as needed from that key and some other data (often referred to as diversification data). The most common use for this method is probably inSmartCard based cryptosystems, such as those found in banking cards. The bank or credit network embeds their secret key into the card's secure key storage during card production at a secured production facility. Then at the Point of sale the card and card reader are both able to derive a common set of session keys based on the shared secret key and card-specific data (such as the card serial number). This method can also be used when keys must be related to each other (i.e., departmental keys are tied to divisional keys, and individual keys tied to departmental keys). However, tying keys to each other in this way increases the damage which may result from a security breach as attackers will learn something about more than one key. This reduces entropy, with regard to an attacker, for each key involved.

Key storage

However distributed, keys must be stored securely to maintain communications security. Security is a big concernand hence there are various techniques in use to do so. Likely the most common is that an encryption application manages keys for the user and depends on an access password to control use of the key. Likewise, in the case of smartphone keyless access platforms, they keep all identifying door information off mobile phones and servers and encrypt all data, where just like low-tech keys, users give codes only to those they trust.

Key use

The major issue is length of time a key is to be used, and therefore frequency of replacement. Because it increases any attacker's required effort, keys should be frequently changed. This also limits loss of information, as the number of stored encrypted messages

which will become readable when a key is found will decrease as the frequency of key change increases. Historically, symmetric keys have been used for long periods in situations in which key exchange was very difficult or only possible intermittently. Ideally, the symmetric key should change with each message or interaction, so that only that message will become readable if the key is learned (*e.g.*, stolen, crypt analyzed, or social engineered).

Challenges

Several challenges IT organizations face when trying to control and manage their encryption keys are:

1. Complexity: Managing a large number of encryption keys.
2. Security: Vulnerability of keys from outside hackers/malicious insiders.
3. Data availability: Ensuring data accessibility for authorized users.
4. Scalability: Supporting multiple databases, applications and standards.
5. Governance: Defining policy driven access control and protection for data. Governance includes compliance with data protection requirements.

Compliance

Key management compliance refers to the oversight, assurance and capability of being able to demonstrate that keys are securely managed. This includes the following individual compliance domains:

- *Physical security* – the most visible form of compliance, which may include locked doors to secure system equipment and surveillance cameras. These safeguards can prevent unauthorized access to printed copies of key material and computer systems that run key management software.
- *Logical security* – protects the organization against the theft or unauthorized access of information. This is where the use of cryptographic keys comes in by encrypting data, which is then rendered useless to those who do not have the key to decrypt it.
- *Personnel security* – this involves assigning specific roles or privileges to personnel to access information on a strict need-to-know basis. Background checks should be performed on new employees along with periodic role changes to ensure security.

Internet Security Protocols and Standards

Network Layer Security

TCP/IP protocols may be secured with cryptographic methods and security protocols. These protocols include Secure Sockets Layer (SSL), succeeded by Transport Layer Security (TLS) for web traffic, Pretty Good Privacy (PGP) for email, and IPSec for the network layer security.

Internet Protocol Security (IPSec)

IPSec is designed to protect TCP/IP communication in a secure manner. It is a set of security extensions developed by theInternet Task Force (IETF). It provides security and authentication at the IP layer by transforming data using encryption. Two main types of transformation that form the basis of IPSec: the Authentication Header (AH) and ESP. These two protocols provide data integrity, data origin authentication, and anti-replay service. These protocols can be used alone or in combination to provide the desired set of security services for the Internet Protocol (IP) layer.

The basic components of the IPSec security architecture are described in terms of the following functionalities:

- Security protocols for AH and ESP
- Security association for policy management and traffic processing
- Manual and automatic key management for the Internet key exchange (IKE)
- Algorithms for authentication and encryption

The set of security services provided at the IP layer includes access control, data origin integrity, protection against replays, and confidentiality. The algorithm allows these sets to work independently without affecting other parts of the implementation. The IPSec implementation is operated in a host or security gateway environment giving protection to IP traffic.

Multi-factor Authentication

Multi-factor authentication (MFA) is a method of computer access control in which a user is granted access only after successfully presenting several separate pieces of evidence to an authentication mechanism – typically at least two of the following categories:

knowledge (something they know), possession (something they have), and inherence (something they are).Internet resources, such as websites and email, may be secured using multi-factor authentication.

Security token

Some online sites offer customers the ability to use a six-digit code which randomly changes every 30–60 seconds on asecurity token. The keys on the security token have built in mathematical computations and manipulate numbers based on the current time built into the device. This means that every thirty seconds there is only a certain array of numbers possible which would be correct to validate access to the online account. The website that the user is logging into would be made aware of that device's serial number and would know the computation and correct time built into the device to verify that the number given is indeed one of the handfuls of six-digit numbers that works in that given 30-60 second cycle. After 30–60 seconds the device will present a new random six-digit number which can log into the website.

Electronic mail security

Email messages are composed, delivered, and stored in a multiple step process, which starts with the message's composition. When the user finishes composing the message and sends it, the message is transformed into a standard format: an RFC 2822 formatted message. Afterwards, the message can be transmitted. Using a network connection, the mail client, referred to as a mail user agent (MUA), connects to a mail transfer agent (MTA) operating on the mail server. The mail client then provides the sender's identity to the server. Next, using the mail server commands, the client sends the recipient list to the mail server. The client then supplies the message. Once the mail server receives and processes the message, several events occur: recipient server identification, connection establishment, and message transmission. UsingDomain Name System (DNS) services, the sender's mail server determines the mail server(s) for the recipient(s). Then, the server opens up a connection(s) to the recipient mail server(s) and sends the message employing a process similar to that used by the originating client, delivering the message to the recipient(s).

Pretty Good Privacy (PGP)

Pretty Good Privacy provides confidentiality by encrypting messages to be transmitted or data files to be stored using an encryption algorithm such as Triple DES or CAST-128. Email messages can be protected by using cryptography in various ways, such as the following:

- Signing an email message to ensure its integrity and confirm the identity of its sender.
- Encrypting the body of an email message to ensure its confidentiality.
- Encrypting the communications between mail servers to protect the confidentiality of both message body and message header.

The first two methods, message signing and message body encryption, are often used together; however, encrypting the transmissions between mail servers is typically used only when two organizations want to protect emails regularly sent between each other. For example, the organizations could establish a Virtual Private Network (VPN) to encrypt the communications between their mail servers over the Internet. Unlike methods that can only encrypt a message body, a VPN can encrypt entire messages, including email header information such as senders, recipients, and subjects. In some cases, organizations may need to protect header information. However, a VPN solution alone cannot provide a message signing mechanism, nor can it provide protection for email messages along the entire route from sender to recipient.

Multipurpose Internet Mail Extensions (MIME)

MIME transforms non-ASCII data at the sender's site to Network Virtual Terminal (NVT) ASCII data and delivers it to client'sSimple Mail Transfer Protocol (SMTP) to be sent through the Internet.The server SMTP at the receiver's side receives the NVT ASCII data and delivers it to MIME to be transformed back to the original non-ASCII data.

Message Authentication Code

A Message Authentication Code (MAC) is a cryptography method that uses a secret key to encrypt a message. This method outputs a MAC value that can be decrypted by the receiver, using the same secret key used by the sender. The Message Authentication Code protects both a message's data integrity as well as its authenticity.

Firewalls

A computer firewall controls access between networks. It generally consists of gateways and filters which vary from one firewall to another. Firewalls also screen network traffic and are able to block traffic that is dangerous. Firewalls act as the intermediate server between SMTP and Hypertext Transfer Protocol (HTTP) connections.

Role of firewalls in web security

Firewalls impose restrictions on incoming and outgoing Network packets to and from private networks. Incoming or outgoing traffic must pass through the firewall; only authorized traffic is allowed to pass through it. Firewalls create checkpoints between an internal private network and the public Internet, also known as *choke points* (borrowed from the identical military term of a combat limiting geographical feature). Firewalls can create choke points based on IP source and TCP port number. They can also serve as the platform for IPSec. Using tunnel mode capability, firewall can be used to implement VPNs. Firewalls can also limit network exposure by hiding the internal network system and information from the public Internet.

Types of firewall

Packet filter

A packet filter is a first generation firewall that processes network traffic on a packet-by-packet basis. Its main job is to filter traffic from a remote IP host, so a router is needed to connect the internal network to the Internet. The router is known as screening router, which screens packets leaving and entering the network.

Stateful packet inspection

In a stateful firewall the circuit-level gateway is a proxy server that operates at the network level of an Open Systems Interconnection (OSI) model and statically defines what traffic will be allowed. Circuit proxies will forward Network packets(formatted unit of data) containing a given port number, if the port is permitted by the algorithm. The main advantage of a proxy server is its ability to provide Network Address Translation (NAT), which can hide the user's IP address from the Internet, effectively protecting all internal information from the Internet.

Application-level gateway

An application-level firewall is a third generation firewall where a proxy server operates at the very top of the OSI model, theIP suite application level. A network packet is forwarded only if a connection is established using a known protocol. Application-level gateways are notable for analyzing entire messages rather than individual packets of data when the data are being sent or received.

Internet security products

Antivirus

Antivirus software and Internet security programs can protect a programmable device from attack by detecting and eliminating viruses; Antivirus software was mainly shareware in the early years of the Internet, but there are nowseveral free security applications on the Internet to choose from for all platforms.

Password managers

A password manager is a software application that helps user store and organize passwords. Password managers usually store passwords encrypted, requiring the user to create a master password; a single, ideally very strong password which grants the user access to their entire password database.

Security suites

So called *security suites* were first offered for sale in 2003 (McAfee) and contain a suite of firewalls, anti-virus, anti-spyware and more.They also offer theft protection, portable storage device safety check, private Internet browsing, cloud anti-spam, a file shredder or make security-related decisions (answering popup windows) and several were free of charge.

Other Encryption issues

For any cipher, the most basic method of attack is brute force; trying each key until the right one is found. The length of the key determines the number of possible keys, and hence the feasibility of this type of attack. Encryption strength is directly tied to key size, but as the key size increases so too do the resources required to perform the computation.

Alternative methods of breaking a cipher include side-channel attacks, which don't attack the actual cipher but its implementation. An error in system design or execution can allow such attacks to succeed.

Another approach is to actually break the cipher through cryptanalysis; finding a weakness in the cipher that can be exploited with a complexity less than brute force. The challenge of successfully attacking a cipher is easier of course if the cipher itself is flawed in the first place. There have always been suspicions that interference from the National Security Agency weakened the Data Encryption Standard algorithm, and following revelations from former NSA analyst and contractor Edward Snowden, many believe they have attempted to weaken encryption products and subvert cryptography standards.

Despite these issues, one reason for the popularity and longevity of the AES algorithm is that the process that led to its selection was fully open to public scrutiny and comment ensuring a thorough, transparent analysis of the design.

Unit 5

E–Com Strategies

As an entrepreneur, getting into ecommerce is a significant step towards growing a business and increasing profits. For those who are just starting a business, ecommerce can potentially be the foundation of a profitable company. Ecommerce is not simply putting up your products online and hoping for the best.

There is a good bit of strategy that goes into making it work. Understanding how ecommerce can affect a business is crucial in making it a success.

Setting up e-commerce shop, nature of strategy & strategic

Ecommerce is now ubiquitous to business in developed countries, but developing countries have yet to catch up with its adoption. However, things have been coming along as ecommerce has started to grow in a big way throughout Asia, especially in China.

In the meantime, mobile has pretty much become the biggest thing in ecommerce these days. However, a lot of businesses aren't converting to m-commerce fast enough to make the most of the mobile user base. With the ecommerce market becoming more competitive than ever before, this may change down the line, as businesses continue to find new ways to gain an edge.

Six factors in ecommerce success:

1. Regulation of product pricing

It's natural for customers to compare prices between brands. It's expected of entrepreneurs, as well, to be aware of how much competitors are charging for their goods. Fortunately, there are different tools available to easily see and compare prices of competing ecommerce websites.

Various pricing strategies are employed to get the sweet spot in attractiveness and earnings, depending on the market and the kind of products being priced. For instance, one of the most common pricing strategies is keystone pricing, which is basically the doubling of wholesale price.

That usually works, but consider additional factors so the price is just right, not too high or too low. There is also discount pricing, psychological pricing, competitive pricing, value-based pricing, and so on.

2. Maintaining high quality products

For a long time, people had the notion that products from ecommerce sites were inferior quality when compared to products from physical stores. While much of that myth no longer exists these days, there is still a lot that must be done to convince customers that your products are comparable in quality as those found in malls and other stores.Make sure you procure your products from well-known and trusted suppliers of high quality goods as well.

You must uphold your standards consistently across the board. If you ever ship a subpar product to a customer, it will definitely be a blow to your business even if you have a return/replacement policy in place. Overall customer satisfaction is crucial to the business' continued survival, and bad product quality can break your business down.

Keep System feedback transparent to the changes in input, and corrective action must be taken as soon as possible. This is a continuing process as there are always other ways to improve.

3. Improving store accessibility

The design of your ecommerce website (online store) must accommodate all types of customers. The online store is your main tool of communicating and transacting with them. It must be able to relay information fast and concisely to evoke the trustworthiness of your business to your customers.

Accessibility is of utmost importance as it helps your business be within reach to all sorts of customers; i.e. people of different cultures, people with disabilities, etc. Have your online store set to other languages can potentially widen your customer base as long as they are a significant part of your audience. It may also be accessible to people with visual disabilities like color blindness and impaired vision, by using high-contrast visual theme and a larger font size for text.

There are also things you can do to make the online store viewed better by mobile devices, such as using responsive design and optimizing your images so they can load faster. The more you improve your website's accessibility, the more people can potentially view it.

4. Making a wonderful first impression

Users know if they like a website or not by just a glance and that first impression usually lasts. Making a good first impression is imperative in getting more customers in your online store. Make the best, eye-catching design possible, in order to entice people into coming in and making use of your ecommerce website.

Good web design has principles you can follow that will help you convince people to take a look at what you have. It should not be too loud or too barren. Everything on it should be easy to understand, yet maintains its own personality.

5. Securing your shipments

One of the main concerns with ecommerce for both entrepreneurs and consumers is the issue of security. With personal and financial information being handled online, there is always the potential for ecommerce websites being compromised and customer data stolen for nefarious purposes. This is especially true for credit card information that gets entered in online every single day.

Make use of SSL to secure your customers' online shopping experience. SSL ensures that transactions and data are encrypted so that there is less of a chance for them to be compromised. Two-factor authentication is also a good way to further secure your online store, and adding other verification methods (without making it too hard for your customers) should help as well.

6. Taking advantage of m-commerce

The mobile user base has grown exponentially over the last few years; thereby the need for online stores to become mobile commerce ready has become virtually mandatory at this point. If your online store is not optimized for mobile devices, then you are missing out on a lot of business.

Some of the things that make an online store optimized for m-commerce are things like responsive design with easy-to-use navigation menus, solid mobile search features, and easy checkout and payment, all done over mobile. You need not have a mobile app to do it, just have your website optimized for mobile if possible

Initiatives aimed at developing national e-commerce strategieshave been launched in most developed and many developingcountries. But what exactly are the key policy areas that havebeen included in the strategies, and how do they differ acrosscountries? In order to provide an overview of what countrieshave done so far or are planning to do in the near future, aninitial survey of national e-commerce strategies has been carriedout. As a result, 51 countries were identified as having ecommercestrategies or as being in the process of formulatingsuch strategies. The objective of the survey was to include asmany developing countries as possible. Therefore, of the 51countries surveyed, 37 were developing and 14developedcountries.

The countries surveyed are at very different stages in theirdevelopment of national ecommerce strategies. Some havealready implemented a number of the policies included in theirplans, or have even revised earlier plans, while others (mainlydeveloping countries) have barely started to set up nationalworking groups to examine the topic and provide policyrecommendations for action.

In spite of this, most strategies contain a number of commonelements.As we can see, three broad policy areas are addressed by the largemajority of country strategies:

(i) Awareness building, training and education
(ii) Access and infrastructure;
(iii) Legal and regulatory issues.

These are followed by policies to support theenterprise sector in using ICT;

- Policies to enhance the development and use of ICT and e-business in targeted domestic sectors

- E-government
- Policies related to the banking system and e-payments

Furthermore a number of other elements, such as those related to standards and trade facilitation, research in thedomestic IT sector and e-commerce, and participation ininternational forums (e.g. WTO, WIPO). The following partswill discuss the most common policy areas in greater detail,trying to identify the key policy elements and assessing thevarious policy options available, especially for developingcountries.

Awareness Building, Training andEducation

As a result of the survey, policies related to awareness building,training and education are by far the most important elementsof national e-commerce strategies: combined, they are includedin the national strategies of 50 countries. Almost all of thesurveyed developing countries (70 per cent), and most of thedeveloped countries (64 percent), have included activities relatedto training and awareness building.

Most policy makers agree that unless businesses and consumersare educated about the opportunities and benefits offered byICT, and unless they are trained to use the Internet, e-commercewill not take off. While access to computers and theInternet is essential, it is not enough; it is equally essential tocreate a demand for the new technologies and for ecommerce.Some have even argued that education, and not connectivity, isthe main challenge for most developing countries seeking toparticipate in the digital economy.

Myths, misperceptions, and missed opportunities surround ecommerceespecially in the developing countries, whereenterprises are often unaware of the benefits and applicationsof e-commerce and ICT. Promoting the use of ICT and theInternet therefore ranks highly on the e-commerce agendas ofdeveloping countries Here governments can set a valuableexample by providing information and services online andusing the Internet as an additional channel of communicationwith citizens. By stimulating demand for information networks,the government and other public agencies can play animportant role in raising

awareness of the usefulness of ecommerceand contributing to the increased use of the new technologies.

Raising Awareness among Citizens and Enterprises

Many countries have launched awareness raising programme tostimulate the use of the Internet among businesses (especiallySMEs) and consumers. By planning a publicawareness programme along with the restructuring of theeducational system to provide IT training and retraining at alllevels linked to the needs of the industry. Developing-countries are not the only ones concerned by the need toraise awareness in the business community of the usefulness ofICT. Awareness building and training often serve the same purposeto stimulate the use of ICT. However, raising awarenessamong citizens who have never used a computer or amongbusinesses that have no IT professionals will achieve little.

Therefore, education and training are fundamental to thewidespread and effective use of new technologies. Since anetworked society is essentially a knowledge society, many ofthe potential benefits of ICT and e-commerce relate directly tothe capability to use information to create new knowledge.

Internet Marketing

Marketing is the process of planning and executing theconception, pricing, promotion, and distribution of ideas,goods, and services to create exchanges that satisfy individualand organizational goals

Internet has irrevocably transformed the field ofmarketing through the introduction of new products, newaudiences, and new strategies for reaching those audiences. The Internet marketing process occurs in seven stages. Theprocess begins with the formulation of corporate and businessunitstrategy, then moves to framing the market opportunity,formulating the marketing strategy, designing the customerexperience, designing the marketing program, crafting thecustomer interface, and evaluating the results of the marketingprogram as a whole.

Seven Stages of Internet Marketing

The following figure provides an overview of the seven stages ofInternet marketing. The seven stages are these:

1. Setting corporate and business-unit strategy,
2. Framing the market opportunity,
3. Formulating the marketing strategy,
4. Designing the customer experience,
5. Designing the marketing program,
6. Crafting the customer interface, and
7. Evaluating the results of the marketingprogram.

Stage One: Setting Corporate and Business-UnitStrategy

Corporate strategy addresses the interrelationship between thevarious business units in a firm, including decisions aboutwhich units should be kept, sold, or augmented. Business-unitstrategy focuses on how a particular unit in the company attacksa market to gain competitive advantage. Consider, for example,Amazon.com. Corporate-strategy issues relate to the choice,mix, and number of business units such as kitchen, music,electronics, books, and tools/hardware. Once these businessunits are established and incubated in Amazon's corporatehead quarters, the senior leadership team of each unit sets thestrategic direction and steers the business unit toward its goals.

Stage Two: Framing the Market Opportunity

Stage two entails the analysis of market opportunities and aninitial first pass of the business conceptthat is, collectingsufficient online and offline data to establish the burden ofproof of opportunity assessment. Let's say, for example, that you are running a major dot com business such as Amazon.The senior management team is continually confronted with go/no g go decisions about whether to add a new business unitor develop a new product line within an existing business unit.

What mechanism do they put in place to evaluate theseopportunities? In this second part of the Internet-marketingprocess, a simple six-step methodology helps evaluate theattractiveness of the opportunity

The six steps include: seeding the opportunity, specifyingunmet or underserved customer needs, identifying the targetsegment, declaring the company's resource-based opportunityfor advantage, assessing opportunity attractiveness, and makingthe final go/no-go decision. The final go/no-go choice is oftena corporate or business-unit decision. However, it is veryimportant to stress that marketing plays a critical role in thismarketopportunity assessment phase.

In order for the firm to make an informed choice about theopportunity, the management team needs to obtain a sufficientpicture of the marketplace and a clear articulation of thecustomer experience that is at the core of the opportunity.

Thus, during the marketopportunity assessment phase, the firm also needs to collect sufficient market research data.

Stage Three: Formulating the Marketing Strategy

Internet marketing strategy is based upon corporate, businessunit,and overall marketing strategies of the firm. This set oflinkages is shown in figure. The marketing strategy goals,resources, and sequencing of actions must be tightly alignedwith the business-unit strategy. Finally, the overall marketingstrategy comprises both offline and online marketing activities.

Stage Four: Designing the Customer Experience

Firms must understand the type of customer experience thatneeds to be delivered to meet the market opportunity. Theexperience should correlate with the firm's positioning andmarketing strategy. Thus, the design of the customer experienceconstitutes a bridge between the high-level marketing strategy(step three) and the marketing program tactics (step five).

Stage Five: Designing the Marketing Program

The completion of stages one through four results in clearstrategic direction for the firm. The firm has made a go/no-godecision on a particular option. Moreover, it has decided uponthe target segment and the specific position that it wishes toown in the minds of the target customer. Stage five entailsdesigning a particular combination of marketing actions(termed levers) to move target customers from awareness tocommitment.

Stage Six: Crafting the Customer Interface

The Internet has shifted the locus of the exchange from themarketplace (i.e., face-to-face interaction) to the market space(i.e., screen-to-face interaction). The key difference is that thenature of the exchange relationship is now mediated by a technologyinterface. This interface can be a desktop PC,sub-notebook, personal digital assistant, mobile phone,wireless applications protocol (WAP) device, or other Internetenabledappliance. As this shift from people-mediated totechnology -mediated interfaces unfolds, it is important toconsider the types of interface design considerations thatconfront the senior management team. What is the look-and--feel, or context, of the site? Should the site include commerceactivities? How important are communities in the businessmodel?

Stage Seven: Evaluating the Marketing Program

This last stage involves the evaluation of the overall Internetmarketing program. This includes a balanced focus on bothcustomer and financial metrics.

Critical Success Factors for Internet Marketing

Marketers have always been in the business of anticipating andmanaging change; technology has been their principle toolfor managing it. The Internet presents an adaptive challenge forthe marketing executive. Today's Internet marketing executives must have all

the traditional skills of the offline marketingprofessional, but must place extra emphasis on some of themto account for the new economy. These critical new skills include

- Customer advocacy and insight
- Integration
- Balanced thinking
- Passion and Entrepreneurial spirit
- Willingness to accept risk
- Ambiguity.

Customer Advocacy and Insight

An insatiable curiosity for customers and marketplaces is a barenecessity for today's marketing professional. This innatecuriosity fuels an individual's desire to transform mounds ofcustomer data into meaningful and actionable insights, which inturn become a platform for advocacy. Because the Internetenables a much greater degree of interaction with customers,designing and promoting these interactions around customers'needs and progressively gaining deeper insights are criticalcomponents of creating positive customer experience. A truecustomer advocate will be looking to provide demonstrableadded value to each customer interaction to form the basis for ameaningful relationship. As both customer behaviors andenabling technologies simultaneously evolve, a deep understandingof customer needs should serve as the guidepostdriving marketing decisions. Marketing professionals will needto strategically collect information from many disparate sources,create insightful customer mosaics, and effectively translatethem into marketing strategies and tactics.

Integration

The Internet represents both a new channel and a new communicationsmedium. The neweconomy marketing professional needs to have an integrated or holistic view of the customerand the enterprise in order to create a uniquely advantagedstrategic plan. In today's multi channel environment, a consistentmessage and experience must be maintained acrosscustomer touch points in order to create a consistent brandimage. Beyond strategy, a marketing manager must fundamentallyunderstand how to integrate these new tools into theoverall marketing mix. Managers who are able to hone theirmarketing plan in a highly

integrated fashion are more likely tocapitalize on the synergies between marketing elements andthus drive greater effectiveness.

Balanced Thinking

An Internet marketing professional needs to be highly analyticaland very creative. Culling specific customer insights from averitable fire hose of data is critically important for neweconomymanagers. It requires understanding the dynamictension between one-to-one marketing and mass marketingand being able to strike a strategic balance between them. It alsorequires determining the appropriate customer data requirements.

Internet marketing professionals must also betechnologically savvy. Understanding the strategic and tacticalimplications of the Internet, leveraging the rapid learningenvironment and accelerated decision-making process it creates,and then creatively applying the insights gleaned from analysisare critical success factors for all Internet marketing professionals.

Passion and Entrepreneurial spirit

Although very hard to objectively assess, passion, or fire in thebelly, is what will differentiate leaders from followers in thenew economy. Trying to change the status quo is never easy andonly people with conviction and passion will be heard over thedin of the inevitable naysayers. Successful marketing managersuse this passion to fuel their entrepreneurial instincts andvision, creating "bleeding edge" tools as they lead their teams tosuccess.

Willingness to Accept Risk and Ambiguity

In the new economy, Internet marketing professionals need toretool themselves and their companies to enter into a wholenew era of customer-centric marketing. The Internet hasenabled customers to have much more information and manymore choices than ever before, thus shifting the balance ofpower toward the customer and creating the need for a wholenew set of "pull" based marketing tools. Successful Internetprofessionals need to rely on a whole new set of marketingtools that work in an extraordinarily dynamic environment.

Having the courage to try new things is the key to developingbreak-through Internet marketing. The risk and ambiguity ofmanaging in such uncharted territory is tremendous, and themost successful Internet marketers will be willing to play at theedges.

Today's online marketing professionals must have the basic skillset of the offline marketing professional. But they must alsoreact more quickly and manage more information and channelsin order to stay one step ahead of the competition. The skill sethas not changed tremendously, but the tools need to be appliedwith more vigor and sometimes with greater speed. SuccessfulInternet marketers will build their business models and valuepropositions around a deep understanding of customer need not around the product.

E-Commerce Ethical and Legal Issues

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. Let's discuss about the ethical and legal issues related to e-business.

Ethical Issues

In general, many ethical and global issues of Information Technology apply to e-business. So, what are the issues particularly related to e-commerce? Let's list some of the ethical issues spawned with the growing field of e-commerce.

Web tracking

E-businesses draw information on how visitors use a site through log files. Analysis of log file means turning log data into application service or installing software that can pluck relevant information from files in-house. Companies track individual's movement through tracking software and cookie analysis. Programs such as cookies raise a batch of

privacy concerns. The tracking history is stored on your PC's hard disk, and any time you revisit a website, the computer knows it. Many smart end users install programs such as Cookie cutters, Spam Butcher, etc which can provide users some control over the cookies.

The battle between computer end users and web trackers is always going on with a range of application programs. For example, software such as Privacy Guardian, My Privacy, etc can protect user's online privacy by erasing browser's cache, surfing history and cookies. To detect and remove spyware specially designed programs like Ad-Aware are present. A data miner application, SahAgent collects and combines Internet browsing history of users and sends it to servers. The battle goes on!

Privacy

Most Electronic Payment Systems knows the identity of the buyer. So it is necessary to protect the identity of a buyer who uses Electronic Payment System.

A privacy issue related to the employees of company is tracking. Monitoring systems are installed in many companies to monitor e-mail and other web activities in order to identify employees who extensively use business hours for non-business activities. The e-commerce activities performed by a buyer can be tracked by organizations. For example, reserving railway tickets for their personal journey purpose can be tracked. Many employees don't want to be under the monitoring system even while at work.

As far as brokers and some of the company employees are concerned, E-Commerce puts them in danger zone and results in elimination from their jobs. The manner in which employees are treated may raise ethical issues, such as how to handle displacement and whether to offer retraining programs.

Disintermediation and Reintermediation

Intermediation is one of the most important and interesting e-commerce issue related to loss of jobs. The services provided by intermediaries are

(i) Matching and providing information.

(ii) Value added services such as consulting.

The first type of service (matching and providing information) can be fully automated, and this service is likely to be in e-marketplaces and portals that provide free services. The value added service requires expertise and this can only be partially automated. The phenomenon by which Intermediaries, who provide mainly matching and providing information services are eliminated is called Disintermediation.

The brokers who provide value added services or who manage electronic intermediation (also known as infomediation), are not only surviving but may actually prosper, this phenomenon is called Re-intermediation.

The traditional sales channel will be negatively affected by disintermediation. The services required to support or complement e-commerce are provided by the web as new opportunities for re-intermediation. The factors that should be considered here are the enormous number of participants, extensive information processing, delicate negotiations, etc. They need a computer mediator to be more predictable.

Legal Issues

Where are the headlines about consumers defrauding merchants? What about fraud e-commerce websites? 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 you buy software you have 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 Cybersquatting, 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.

Future of Electronic Commerce

The world of retail is definitely undergoing fundamental changes at present; most of them are attributable to technology introduction and its becoming ever more commonplace in all domains of human lives. However, it is not all about technology; an aspiring business retailer should also take into account the new business models affecting e-commerce, as well as changing consumer behaviors and expectations. This article gives a brief account of

projected trends and expected changes in the world of e-commerce, with relevant implications of these evolutionary changes for both merchants and users of their services.

People used to go to department stores when they needed to buy a variety of products in one place. And it is still working that way for many people. But let's think if it is a feasible shopping mode in future. The world speeds up every day and we keep looking for options to get everything done with less time and energy. So, it is obvious that the Internet can offer millions of items at a click. Thus, it seems that in the next couple of decades (if not years) to come, going shopping to the department store might turn into a curious old-fashioned hobby rather than a part of everyday life.

Even today it's hard to find a relatively big and successful offline store that has not yet built its presence online. In fact, in the 21st century, if you are not online, everyone doubts you exist! So, in the next few years, the online retail is expected to win ever more customers – you can already observe the process of offline stores offering more options and items online. Going online is cheaper, faster, and more convenient for both customers and the merchant, so it is not surprising that the era of online retail is gaining momentum, while most offline stores are staying in the past.

While everything is getting faster, all the devices are getting smaller, lighter, and more portable. No wonder that mobile phone is the main device with the help of which everyone is going to communicate, surf the Internet, and shop in future. The representatives of youngest generation already feel surprised when they come across a website without a mobile app, and this is only a start – it seems very realistic that only in couple of years, everyone will only use notebooks and computers to do some serious technical tasks. Everything else will be done on mobile phones and tablets; in 2016, over $100 billion sales were made on mobile and desktop devices only and the figure is expected to continue growing.

Advertising used to be the greatest tool to tell people that your store exists, but now that there are advertisements everywhere, it is no longer effective. Today, people want open communication; they trust opinion leaders and want to know what ideas are staying behind

each brand. And that's why social media is a new main tool and a key driver of e-commerce. Because of this, communication between brands and customers is expected to get closer and less formal, so brands already acting like that are in the winning situation. It is thus imperative for business to learn efficient social sharing to increase their online presence, convert more visitors into customers, and to take a decent share of the online business of the future.

Similar to people preferring brands to be more open and act more human, messaging is becoming an important e-commerce tool. A merchant can send texts about sales, special offers or some personal sets of items based on their preferences and previous purchases. It also can be a message conversation with a consultant on a website. The only way to be in trend is to implement this tool into your business and make it as personal as possible.

Augmented Reality and Virtual Reality are not science fiction anymore; they are finally becoming our commonplace reality. With the help of a wearable device like Google's Glass, most merchants will soon have a chance to link the real world and virtual reality in comprehensive augmented devices and technologies, which promises a new exciting shopping experience. You will be able to know much more about what your customers want and (what's even more important) will have an opportunity to provide them with this experience.

With all those changes taking place abruptly and changing the online marketplace forever, business owners are urged to keep pace with the changes and address new customer needs, which are mostly tied to cross-platform usability, easy navigation, mobile accessibility, and intuitive interfaces. Amasty'sMagento extension is one of solutions enabling handy and quick optimization of the online shop to users' demands via quick and simple navigation, sorting by brand, and intuitive menu allowing shoppers to find everything they need very quickly. As it was righteously noted by founders of Colgate-Palmolive, the main word characterizing a consumer of the future is "convenience," with any product available to shoppers anytime and anywhere, the way they want it. Thus, in the modern highly competitive market of everyone shopping online, the winner will be the one who makes the site's use comfortable and fun.

As it comes from the discussed trends, the irreversible change is already here; it has affected the way in which people interact, search for products to buy, and conduct shopping. Businesses are also changing in line with the context changes, but the key focus of e-commerce players should remain on the consumer. Understanding what drives users to select one shopping destination in favor of the other one, discerning the features of appealing interfaces and commercial appeals, and learning to deal with shoppers of the 21st century is a hard battle, but the winner takes it all. Thus, businesses that capture the essence of change and find an appeal to new customers are doomed to commercial success and grand revenues!

Cyber Laws

Cyber Law is the law governing cyber space. Cyber space is a very wideterm and includes computers, networks, software, data storage devices(such as hard disks, USB disks etc), the Internet, websites, emails andeven electronic devices such as cell phones, ATM machines etc.

Law encompasses the rules of conduct:

1. that have been **approved** by thegovernment, and

2. which are in **force** over a certainterritory, and

3. which must be **obeyed** by all persons on that territory.

Violation of these rules could lead togovernment action such as imprisonmentor fine or an order to pay compensation.

Cyber law encompasses laws relating to:

1. Cyber Crimes

2. Electronic and Digital Signatures

3. Intellectual Property

4. Data Protection and Privacy

Cyber crimes

Cyber crimesare unlawful acts where the computer is usedeither as a tool or a target or both. The enormous growth inelectronic commerce (e-commerce) and online share trading hasled to a phenomenal spurt in incidents of cyber crime.

Electronic signatures

Electronic signatures are used to authenticate electronicrecords. Digital signatures are one type of electronic signature.Digital signatures satisfy three major legal requirements – signerauthentication, message authentication and message integrity.The technology and efficiency of digital signatures makes themmore trustworthy than hand written signatures.

Intellectual property

Intellectual property is refers to creations of the human mind e.g.a story, a song, a painting, a design etc. The facets ofintellectual propertythat relate to cyber space are covered bycyber law.

These include:

- **Copyright law** in relation to computer software, computersource code, websites, cell phone content etc,
- Software and source code **licenses**
- **Trademark law** with relation to domain names, Meta tags,mirroring, framing, linking etc
- **Semiconductor law** which relates to the protection ofsemiconductor integrated circuits design and layouts.
- **Patent law** in relation to computer hardware and software.

Data protection and privacy laws

Data protection and privacy laws aim to achieve a fair balancebetween the privacy rights of the individual and the interests ofdata controllers such as banks, hospitals, email service providersetc. These laws seek to address the challenges to privacy causedby collecting, storing and transmitting data using newtechnologies.

Need for Cyber Law

There are various reasons why it is extremely difficult for conventionallaw to cope with cyberspace. Some of these are discussed below.

1. Cyberspace is an **intangible** dimension that is impossible togovern and regulate using conventional law.

2. Cyberspace has complete **disrespect for jurisdictionalboundaries**. A person in India could break into a bank'selectronic vault hosted on a computer in USA and transfermillions of Rupees to another bank in Switzerland, all withinminutes. All he would need is a laptop computer and a cell phone.

3. Cyberspace handles **gigantic traffic volumes every second**.Billions of emails are crisscrossing the globe even as we readthis, millions of websites are being accessed every minute andbillions of dollars are electronically transferred around the worldby banks every day.

4. Cyberspace is absolutely **open to participation by all**. A tenyear-old in Bhutan can have a live chat session with an eightyear-old in Bali without any regard for the distance or theanonymity between them.

5. Cyberspace offers **enormous potential for anonymity** to itsmembers. Readily available encryption software andsteganographic tools that seamlessly hide information withinimage and sound files ensure the confidentiality of informationexchanged between cyber-citizens.

6. Cyberspace offers never-seen-before **economic efficiency**.Billions of dollars worth of software can be traded over theInternet without the need for any government licenses, shippingand handling charges and without paying any customs duty.

7. Electronic information has become the main object of cybercrime. It is characterized by **extreme mobility**, which exceeds byfar the mobility of persons, goods or other services. Internationalcomputer networks can transfer huge amounts of data around theglobe in a matter of seconds.

8. A software source code worth crores of rupees or a movie can be**pirated across the globe** within hours of their release.

9. **Theft of** corporeal **information** (e.g. books, papers, CD ROMs,floppy disks) is easily covered by traditional penal provisions.

However, the problem begins when electronic records are copiedquickly, inconspicuously and often via telecommunicationfacilities. Here the "original" information, so to say, remains in the"possession" of the "owner" and yet information gets stolen.

Jurisprudence of Indian Cyber Law

The primary source of cyber law in India is the **Information TechnologyAct**, 2000 (IT Act) which came into force on 17 October 2000.

- The primary purpose of the Act is to provide **legal recognition to electronic commerce** and to facilitate filing of **electronic records with the Government**.
- The IT Act also penalizes various **cyber crimes**and provides strict punishments (imprisonment terms up to 10 years and compensation up to Rs 1 crore).

- An **Executive Order** dated 12 September 2002 contained instructions relating provisions of the Act with regard to protected systems and application for the issue of a Digital Signature Certificate.
- Minor errors in the Act were rectified by the **Information Technology (Removal of Difficulties) Order**, 2002 which was passed on 19 September 2002.
- The IT Act was amended by the **Negotiable Instruments (Amendments and Miscellaneous Provisions) Act**, 2002. This introduced the concept of electronic cheques and truncated cheques.
- **Information Technology (Use of Electronic Records and Digital Signatures) Rules**, 2004 has provided the necessary legal framework for filing of documents with the Government as well as issue of licenses by the Government.

- It also provides for payment and receipt of fees in relation to the Government bodies.

On the same day, the **Information Technology (Certifying Authorities)Rules**, 2000 also came into force.These rules prescribe the eligibility, appointment andworking of Certifying Authorities (CA). These rules also laydown the technical standards, procedures and securitymethods to be used by a CA.These rules were amended in 2003, 2004 and 2006.

Information Technology (Certifying Authority)Regulations, 2001 came into force on 9 July 2001. Theyprovide further technical standards and procedures to beused by a CA.

Two important guidelines relating to CAs were issued. Thefirst are the **Guidelines** for submission of application forlicense to operate as a Certifying Authority under the ITAct. These guidelines were issued on 9th July 2001.

Next were the **Guidelines** for submission of certificatesand certification revocation lists to the Controller ofCertifying Authorities for publishing in National Repositoryof Digital Certificates. These were issued on 16thDecember 2002.

The **Cyber Regulations Appellate Tribunal (Procedure) Rules**, 2000also came into force on 17th October 2000.These rules prescribe the appointment and working of the

Cyber Regulations Appellate Tribunal (CRAT) whoseprimary role is to hear appeals against orders of theAdjudicating Officers.

The **Cyber Regulations Appellate Tribunal (Salary,Allowances and other terms and conditions of serviceof Presiding Officer) Rules**, 2003 prescribe the salary,allowances and other terms for the Presiding Officer of theCRAT.

Information Technology (Other powers of Civil Courtvested in Cyber Appellate Tribunal) Rules 2003provided some additional powers to the CRAT.

An important **order relating to blocking of websites** was passed on27th February, 2003.

Computer Emergency Response Team (CERT-IND) caninstruct Department of Telecommunications (DOT) toblock a website.

The **Indian Penal Code** (as amended by the IT Act) penalizes severalcyber crimes. These include forgery of electronic records, cyber frauds,destroying electronic evidence etc.

Digital Evidence is to be collected and proven in court as per theprovisions of the **Indian Evidence Act** (as amended by the IT Act).

In case of bank records, the provisions of the **Bankers' Book EvidenceAct** (as amended by the IT Act) are relevant.

Investigation and adjudication of cyber crimes is done in accordance withthe provisions of the **Code of Criminal Procedure** and the IT Act.

The Reserve Bank of Indias Act was also amended by the IT Act.

E-Commerce Opportunities

Direct sales

Many businesses use e-commerce for the direct selling of goods or services online. For some businesses such as those selling software or music, the sale and delivery of goods can be made online. For most the supply of goods will continue to require a physical delivery.

If you plan to sell online, you may need to rethink many of your business activities. You will fundamentally change the way in which you interact with your customers - for example, if customers place orders online instead of talking to a salesperson. You will also need to work out how every aspect of a transaction is handled - including order confirmation, invoicing and payment, and deliveries and returns.

Pre-sales

You can use your website for pre-sales activities - exploiting the widespread use of the internet to generate sales leads. At its most basic this can mean having an online version of your promotional materials on your site. Other options include email campaigns, search marketing or online advertising to attract visitors to your website.

Post-sales support

You can also use the internet to automate aspects of your customer support to reduce the number of routine customer service calls. This can be achieved by using your site to answer the most frequently asked questions, or by putting technical information online.

Ensuring success

However you decide to use e-commerce, it is important to define your expectations from the outset. What level of sales are you hoping to make? How many sales leads are you looking to generate? What percentage reduction in customer telephone calls are you expecting to achieve? Ensure that targets are put in place so that you can measure the success, or otherwise, of your e-commerce activities.

All these become possible with - Extended use of AI, Advanced chatbots for making orders & customer service, VR shopping, Same-day delivery & drone delivery, and Live streaming

Embedded E-Commerce

A new type of service provider that allows content web sites to make profits losing traffic or having to build an online store. Some service providers offer e-commerce services in which the customer places an order right on the content web site. The web site appears to be the retailer. However, behind the scenes, the service provider processes the order and handles product distribution, giving the content site a portion of every sale. Other providers set up web sites with brand-name Internet retailers, right on the content web site. The content web site gets a portion of the sales, similar to an affiliate program.

For example, The Shopify Buy Button is the easiest way to add ecommerce to any website. You can use it to sell your products on WordPress, Tumblr, Squarespace, on your own self-hosted website, or anywhere else. Adding a buy button to your website is as simple as embedding a YouTube video, and you get all the power and reliability of the Shopify platform.

Here's an example. Say you've built a following on your WordPress blog, and you want to sell t-shirts to your audience. Log into Shopify, add the product, and then generate

your buy button. Copy and paste the embed code provided into your blog's sidebar, a post, or any page.

Once you publish the page, you can easily customize the look and feel of the buy button in order to match your branding, and it is fully responsive, so it looks great on computers, smart phones, and tablets.

If you're selling more than one product, you can also include an embedded shopping cart, so visitors to your website can buy multiple products at once, or come back later to checkout.

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