

SHRIMATI INDIRA GANDHI COLLEGE
(NATIONALLY ACCREDITED AT “A” GRADE (3RDCYCLE) BY NAAC)
TIRUCHIRAPPALLI-2

TUTORIAL MATERIAL
E-COMMERCE



DEPARTMENT OF COMPUTER SCIENCE

S.No	Topic	Page.No
1	ELECTRONIC COMMERCE FRAME WORK	5-7
2	INTERNET AS INFRASTRUCTURE	8-17
3	E-COMMERCE AND WWW	18-25
4	ELECTRONIC PAYMENT SYSTEMS	25-39
5	ADVERTISING AND THE MARKETING ON THE INTERNET	39-40

UNIT I

E-commerce framework:

E-commerce framework is related to software frameworks for e-commerce applications. They offer an environment for building e-commerce applications quickly suitable for building virtually all kinds of online shops and e-commerce related (web) applications.

E-commerce media convergence:

Convergence is the welding of consumer electronics, television, publishing, telecommunication and computer for the purpose of facilities new forms of information based commerce. The convergence may be classified as: (1) Multimedia convergence; and (2) Cross media convergence.

B2B transaction:

Business-to-Business type of E-Commerce comprised of many major commercial activities and these activities are conducted over networks. Financial transactions, purchase orders, bills, payments, etc., were earlier done through private networks. This portion of E-Commerce is restricted to the known partners and the methods used are secure procedures based on firewalls, encryptions and legal authorization level with usual trade terms and conditions. These private nets assisted the closed circles only and hence the role of outsiders was restricted. However, at present, the Business-to-Business e-commerce is done between business units.

Anatomy of E-Commerce Applications:

There is increasing usage of e-commerce applications in all walks of life. It has become a powerful driving force for all type of business

organizations. Multimedia is a part of infrastructure. There is need to study the e-commerce applications, multimedia and about access points.

Multimedia Combinations:

The multimedia is the combination of various form of data or information, which are in the digital form. The possible combinations of the multimedia are: Text, Images, Audio, Video, Animation, Holograms, Numerical data Graphics, Combined piece files, Combined piece documents

Internet:

Interconnected network (Internet) is the important component of the I-way. It is a fine information distribution system prevailing in various countries. It is combination of postal service, telephone system, research library, supermarket and a theatre hall. Information is exchanged between individuals and groups. Information exchange takes place in seconds at least expense.

Video Conference:

Video conferencing is a recent technological advancement. In this method, there is use of television equipment to link geographically dispersed conference participants. The equipment provides both sound and picture. Video conferencing may be (a) point to point video conferencing or (b) Multi-point video conferencing.

Expansion of (a) LAN (b) WAN (c) MAN (d) VAN:

LAN -Local Area Network.

WAN -Wide Area Network .

MAN -Metropolitan Area Network.

VAN –Value Added Network.

Network infrastructure of E-commerce:

Network infrastructure is required for e-commerce to transport content. I-way is a high-capacity, interactive electronic pipeline used to transfer content in case of e-commerce. I-way can transfer any type of context like, text, graphics, audio, video. In other words, multimedia contents are easily transported through I-way.

Components of I-way:

Consumer access equipment. Local on-ramps Global information distribution networks.

Consumer access equipment:

Devices used by consumers to access the multimedia interactive contents of e-commerce. Here segment, hardware and software vendors are also included.

Local or access road, or on-ramps:

This segment of I-way simplify linkages between businesses, universities, and homes to the communications backbone. There are four different types of provider of access ramps:
-telecom-based -cable TV-based -wireless-based and -computer-based online information services. These providers link users and e-commerce application providers.

Set-top boxes:

A set-top box (STB) or set-top unit (STU) (one type also colloquially known as a cable box) is an information appliance device that generally contains a TV-tuner input and displays output to a television set and an external source of signal, turning the source signal into content in a form that can then be displayed.

UNIT II

Introduction to Information Superhighway (I-Way)

Electronic commerce needs a network infrastructure to transport the content (data) used for business purpose. Information superhighway is also known as interactive or multimedia superhighway. The information superhighway is a term coined by Vice President Albert Gore when giving a speech on January 11, 1994 describing the future of computers accessing and communicating over a world-wide network. Basically, the term I-way describes a high-capacity (broadband), interactive (two-way) electronic pipeline to the home or office that is capable of simultaneously supporting a large number of electronic commerce applications and providing interactive connectivity between users and services and between users and other users. It is envisioned to provide very high speed access to information in all forms (text, graphics, audio, video) via a telephone or wireless connection. Thus Information superhighway is the global information and communications network that includes the Internet and other networks and switching systems such as telephone networks, cable television networks, and satellite communication networks used for e-commerce and many more other purposes.

Components of the I-Way

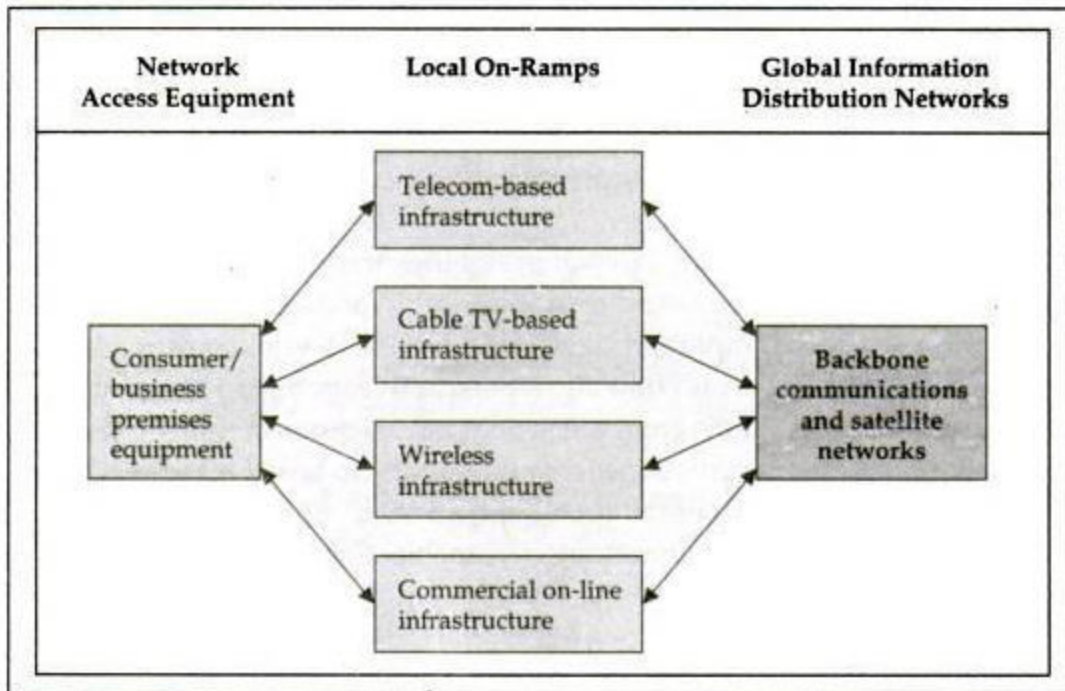
Three major components make up the I-way infrastructure, as shown in figure below: consumer access equipment, local on-ramps, and global information distribution networks.

Consumer access equipment is often ignored in discussions of the I-way but represents a critical category, the absence or slow progress of which is holding up other segments of the Iway. For instance, interactive TV is uncommon, not because of a lack of wiring, but because of a lack of

affordable equipment on the customer's side for access and on the provider's side for distribution. This segment of the I-way includes hardware and software vendors, who provide physical devices such as routers and switches, access devices such as computers and set-top boxes, and software platforms such as browsers and operating systems.

Local or access roads, or on-ramps, simplify linkages between businesses, schools, and homes to the communications backbone. This component is often called the "last mile" in the telecommunications industry. The providers of access ramps can be differentiated into four categories: telecom-based, cable TV—based, wireless-based, and computer-based on-line information services that include value-added networks (VANs).

Global information distribution networks represent the infrastructure crisscrossing countries and continents. Most of the infrastructure for the I-way already exists in the vast network of fiber optic strands, coaxial cables, radio waves, satellites, and copper wires spanning the globe. Linking all the components of the I-way will require large capital investments in "open" systems (interoperable equipment that uses common standards) and installing gateways between various networks. A final requirement is switching hardware and software to move huge amounts of data effortlessly over such a complex network.



Three components of the information superhighway infrastructure can be summarized as:

1) Network access equipments:

-represent the end users hardware and software which are often ignored

For example computers, routers, hub, switches, browser, OS etc.

2) Local on-ramps:

-simplifies linkages between users and the communication backbone.

For example it can be categorized into:

- i. telecom-based
- ii. cable TV-based
- iii. wireless-based
- iv. computer-based

3) Global information distribution networks:

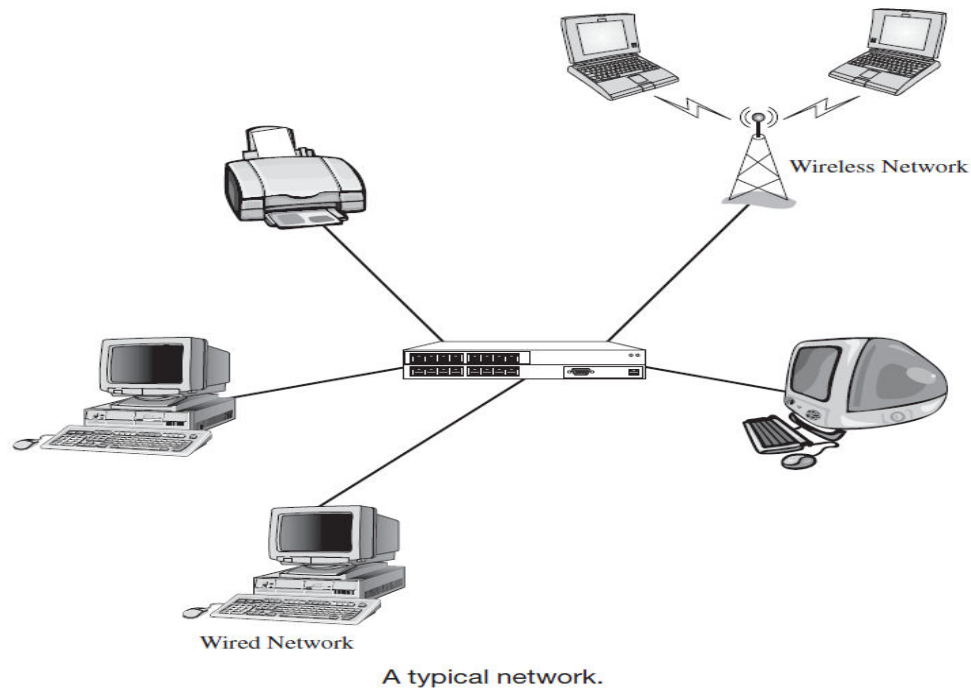
-communication infrastructure can cross the countries and continents. For example fiber optic strands, coaxial cables, radio waves, satellites, and copper wires.

Internet as a Network Infrastructure

Network Concept: In general, networking is the practice of linking two or more computing devices together for the purpose of sharing data. Networks are built with a mix of computer hardware and computer software. Networks are used to make work and communication more efficient. A network connects computers, but can also connect other devices such as shared printers, removable media drives, scanners, and other equipment.

Networks enable people to share resources, including printers, hard disks, and applications, which can greatly reduce the costs of providing these resources to each person in a company. Networks are built around this idea, connecting shared sources resources to their consumers. Several terms are used to describe these network devices, including hosts, nodes, workstations, peers, servers, and clients. Any device capable of communicating on the network is also referred to generically as a node.

A typical network like the one in figure below has three basic hardware components: one or more servers or host computers (including microcomputers and mainframes), clients (PCs), and a circuit or network system, which is the path over which they communicate.



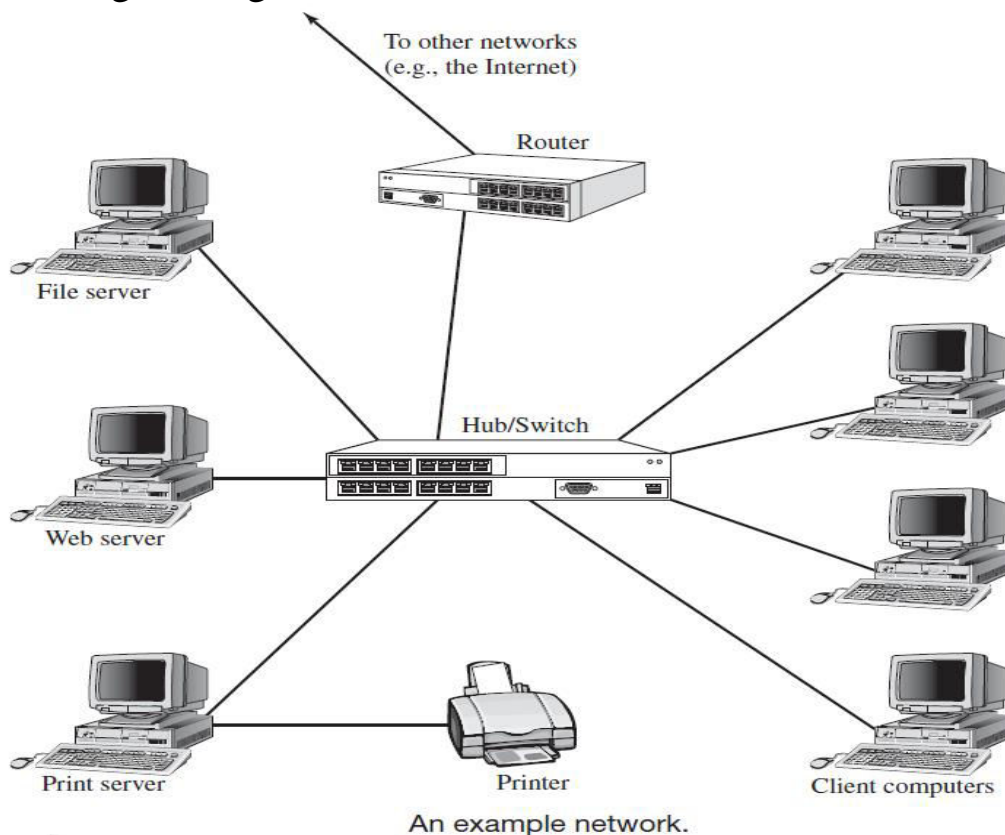
In addition, servers and clients also need special-purpose network software that enables them to communicate. The server stores data and software that the clients can access. You can have several servers working together over the network with client computers to support the business application. The client is the input–output hardware device at the user’s end of a communication circuit. It provides users with access to the network, the data and software on the server, and other shared resources.

Strictly speaking, a network does not need a computer designated specifically as a server. Most modern client computers are designed to support the dual roles of both client and server, sharing resources to the network and, at the same time, accessing resources from the network. The circuit (cable plant or transmission media) is the pathway through which the data or information travels. Traditional wired networks typically use copper wire, although fiber-optic cable and wireless

transmission hybrid systems are common. There are also devices in the circuit that perform special functions such as hubs, switches, routers, bridges, and gateways.

Network Device Roles:

Figure below shows a small network that has four client PCs and three specialized server PCs connected by a hub or switch and cables that make up the circuit. In this network, messages move through the hub to and from the computers. All computers share the same circuit and take turns sending messages.



computer, client, or server has a network adapter, or network interface card (NIC). In the case of a wireless network, the network adapter sends and receives radio frequency messages, not that different from a walkie-talkie or cell phone. The network adapter also determines the low level

protocol used by the computer to communicate on the network. Network adapters running on one protocol cannot communicate with network adapters running on a different protocol.

In older networks, hubs are used as central points where the cables leading out to network PCs come together. A **hub** is simply a connection point that does not provide any sophisticated control. In current networks, you are more likely to see a **switch** rather than a hub. From the outside, both look much the same, but a switch is a more sophisticated communication device that helps control and manage the data passing between the PCs. Figure above also shows a **router**. The router enables computers on one network to communicate with computers on other networks, but at the same time provide a level of isolation between the networks. Routers are a key part of the Internet, which is, at its core, a massive set of interconnected networks. A **gateway** is used to connect dissimilar networks and devices. For example, a gateway can be used to connect PCs on a LAN to a mainframe computer.

Like routers, bridges connect a network to other networks. Bridges do not provide the same level of isolation as routers, but can be used in some situations where routers cannot be used. Another device, called a router, combines the functionality of a bridge and router in the same device.

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

The basic difference between clients (which include peer servers) and servers is the software that they run. Clients, as you might guess, run a client operating system. Common client operating systems include Microsoft Windows XP, Windows Vista, and Windows 7. Servers run what is called either a server operating system or network operating system. Either one enables the computer to act as a server, by running the software necessary for central security management. Server operating systems typically include a client interface. Familiar examples

are Windows Server systems such as Windows 2003 Server and Windows Server 2008, as well as most Linux versions.

The Internet: The public Internet is a world-wide computer network, i.e., a network that interconnects millions of computing devices throughout the world. Most of these computing devices are traditional desktop PCs, Unix-based workstations, and so called "servers" that store and transmit information such as WWW pages and e-mail messages. Increasingly, nontraditional computing devices such as Web TVs, mobile computers, pagers and toasters are being connected to the Internet. In the Internet jargon, all of these devices are called hosts or end systems. The Internet application, with which many of us are familiar, such as the WWW and email, are network application programs that run on such end systems.

End systems, as well as most other "pieces" of the Internet, run protocols that control the sending and receiving of information within the Internet. TCP (the Transmission Control Protocol) and IP (the Internet Protocol) are two of the most important protocols in the Internet. The Internet's principle protocols are collectively known as TCP/IP protocols. End systems are connected together by communication links. Links are made up of different types of physical media: coaxial cable, copper wire, fiber optics, and radio spectrum (wireless). Different links can transmit data at different rates. The link transmission rate is often called the link bandwidth, and is typically measured in bits/second.

Internet Service Providers (ISPs)

WRITE A COMMENT

An Internet Service Provider (ISP) is a company that provides third parties access to the Internet. Many ISP also offer other related services

such as Web site design and virtual hosting. An ISP has the equipment and the telecommunication line access required to have a point-of-presence on the Internet for the geographic area served. An ISP acts as an intermediary between its client's computer system and the Internet. ISPs take several forms and offer a wide variety of services. They generally charge their customers for Internet access depending on their usage needs and the level of service provided.

TYPES OF ISPs

Internet access is available from a wide range of companies, including telephone and cable companies, online services, large national ISPs, and small independent ISPs. There are no reliable data on the number of ISPs in the market. An article in the *Philadelphia Business Journal* estimated that there were more than 7,000 firms providing Internet access in the United States by the middle of 2000. Other industry observers and participants dispute this figure suggesting that the number of ISPs is much lower. Whatever the actual number of ISPs may be, what is certainly clear is that those interested in setting up an Internet access account have many choices available. Choosing one that best suits one's needs takes a little study.

Online Services

The first Internet service providers to become widely known weren't even full ISPs but rather what were known as online services because of their members-only offerings and somewhat limited full Internet access. These were America Online (AOL) and CompuServe. It is usually very easy to set up an account with one of the major online services. A computer user equipped with a modem can establish an account of this sort and begin surfing the Internet with just a few clicks of a mouse.

Although easy to establish and set up, an account with one of these large online services may not be the most appropriate way for a small business to access the Internet. Online services have some disadvantages. For example, access to a small business's web site and promotional

information may be limited to members of the online service. In addition, many online services charge high advertising fees—or collect a percentage of sales—when they are used to conduct Internet commerce. Finally, some online services monitor and restrict the content of information sent via e-mail or posted to newsgroups.

National ISPs

Another type of ISP is the national ISP. These include such companies as Earthlink and MindSpring who offer Internet access in a broad geographical area. Compared to local ISPs, these companies tend to offer higher-speed connections and greater long-term stability. Many national providers also offer a broad range of services, including long-distance telephone service, web site hosting, and secure electronic transactions. They are generally a good choice for small businesses that want employees to be able to access the Internet while traveling. They may also be convenient for businesses that operate in several locations and wish to use the ISP for all locations. The main disadvantages of the larger ISPs are that they rarely offer the level of personalized service available from smaller providers, and they may have so many customers that a small business's employees could have trouble gaining access during prime business hours.

Small ISPs

Small, independent ISPs operate in many local or regional markets. These companies vary widely in size, stability, and quality of service. On the plus side, their access lines may be less busy than national ISPs. In addition, many smaller providers specialize in offering services to small businesses. Some of these ISPs may visit a small business customer's work site, evaluate the company's Internet access needs, and present different service packages. They may even assign a personal account representative to handle the small business's growing electronic needs.

UNIT III

Network Security :

Network Security refers to the security of operating systems and servers. Hackers can gain portions of control over your operating systems or servers by exploring flaws in operating system and server software.

Firewall:

Firewalls is the filter between the private network and the internet. It keeps the firm"s network secure from outside intruders. It allows the authenticated users to access the data or to the internet. Firewall is a software program that allows the authenticated users with some characteristics to access to the protected database or network. Only the insiders have the full access to the data. The outsiders are given access on selective basis. The authentication will be in the form of user name and password. It acts as a wall between the secured intranet and the unsecured internet.

URL:

Uniform Resource Locators are the strings that locate the files or text pointed out by the pointers. URL is the „libraries and locations“ on the shelf. The URLs are the strings used to as addresses of objects on the web. The address is unique and may be used by any other internet user to send mails etc.

E-COMMERCE SECURITY:

E-commerce security is the protection of e-commerce assets from unauthorized access, use, alteration, or destruction. Integrity: prevention against unauthorized data modification, Nonrepudiation: prevention against any one party from reneging on an agreement after the fact, Authenticity: authentication of data source, Confidentiality: protection against unauthorized data disclosure, Privacy: provision of data control and disclosure, Availability: prevention against data delays or removal.

Client server network security problem:

Physical security holes: It results when individual gains unauthorized physical access to the computer. A good e.g. would be a public workstation room, where it would be easy for a wandering hacker to reboot a machine into single user mode and temper with the files, if precautions are not taken. On the network this is also a common problem, as hackers gain access to network system by guessing passwords of various users.

Software Security holes:

It results when badly written program or “privileged” software are “compromised” into doing things they shouldn’t. The most famous e.g. of this is the “send mail” hole, which brought the internet to its knees in 1988. A more recent problem was the (a malicious hackers) to create a “root” shell or super user access mode. This is the highest level of access possible and could be used to delete the entire file system or create new account or password file resulting in in-calculable damage.

Inconsistent uses holes: It results when system administrator assembles combination of hardware and software such that the system is seriously flawed from a security point of view. The incompatibility of attempting 2 unconnected but useful things creates the security holes. Problems like this are difficult to isolate ones a system is setup and running so it is better to carefully build the system with them in mind. This type of problem is becoming common as software becomes more complex.

Security threat:

Security threat is a possible danger that might exploit a vulnerability to breach security and therefore cause possible harm. Client-server security threats can be divided into 2 major categories:- a) Threats to client b) Threats to server. Client threats mostly arise from malicious data or code, malicious code refers to viruses, worms, Trojan horses & deviant.

Most common security threats are phishing attacks, money thefts, data misuse, hacking, credit card frauds and unprotected services. Inaccurate management-One of the main reason to e-commerce threats is poor management. When security is not up to the mark it poses a very dangerous threat to the networks and systems.

Data and Message Security:

One major threat to data security is unauthorized network monitoring also called packet sniffing. Messaging Security is a program that provides protection for companies messaging infrastructure.

Protection from Client Server Network Security:

Trust based security: means to trust everyone and do nothing extra for protection. It is possible not to provide access restriction of every kind and to assume that all users are trustworthy and competent in their use of the shared network. This approach assumes that no-one ever makes an expensive breach such as getting route access and deleting all files (a common hacker tricks). This approach in the past, when the system administrator had to worry about limited threats. Today there is no longer the case.

Security through obscurity (STO): It is the notation that any network can be secure as long as nobody outside its management is allowed to find-out any thing about its operational details and users are provide information on a need-to-no basis. Hiding account passwords in binary files or script with the presumptions that “nobody will ever find them” is a primary case of STO. In-short STO provides a false sense of security in computing systems by hiding information. Although admittedly sound in theory, this philosophy can mean life long trust of a small group of people.

Passwords schemes: This security solution erects a first level barrier to accidental intrusion. In actuality, however, password schemes do little about deliberate attack, specially, when common words or proper names are selected as passwords. Having distinct passwords for a distinct device is somewhat a problem, because will write them down, share them or include them in automatic script. To counter these threats

various approaches have been suggested for creating one time passwords, including smart cards, randomized tokens and challenge response schemes.

Biometric system: It is the most secure level of authorization, involve some unique aspects of a person's body. It is very expensive to implement: at a cost of several thousands dollar per reader station, they may be better suited for controlling physical access – where one biometric unit can serve for many worker-then for network or workstation access. Past biometric authentication was based on comparison of finger prints, palm prints, retinal patterns or on signature verification or voice recognition.

Virus & Malicious Code:

Computer Virus.

Worms.

Trojan Horses.

Spyware & Adware.

Rootkit.

Active Content.

Zombies and Botnets.

Scareware.

Architectural Framework of E-Commerce:

The software framework necessary for building electronic commerce applications is little understood in existing literature. In general a framework is intended to define and create tools that integrate the information found in today's closed systems and allow the development of e-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, computer languages, software agent based transaction monitors, or communication protocols Rather, the architecture should focus on synthesizing the diverse resources already in place in corporations to facilitate the integration of data and software for better applications. The electronic commerce application architecture consists of six layers of functionality, or services: (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 data management 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, fibre optic These layers cooperate to provide a seamless transition between today’s computing resources and those of tomorrow by transparently integrating information access and exchange within the context of the chosen application. As seen in table above, electronic commerce applications are based on several elegant technologies. But only when they are integrated do they 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 them differently using electronic cash and secure payment systems, and have them delivered differently. 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 brand differentiation no longer hold-where “quality” has a new meaning, where “content” may not be equated to “product,” Where “distribution” may not automatically mean “physical transport.” In this new environment, brand equity can rapidly evaporate forcing firms to develop new ways of doing business.

Business-to Business Transactions

It is market-link transaction the businesses, governments, and other organizations depend on computer – to- computer communication as a fast, an economical, and a dependable way to conduct business’ transactions. Small companies are also beginning to see the benefits of adopting the same methods. Business-to-business transactions include the use of EDI and electronic mail for purchasing goods and services, buying information and consulting services, submitting requests for proposals, and receiving proposals. The current accounts payable process occurs through the exchange of paper documents. Each year the trading partners exchange millions of invoices, checks, purchase orders, financial reports, and other transactions. Most of the documents are in electronic form at their point of origin but are printed and key-entered at the point of receipt. The current manual process of printing, mailing is

costly, time consuming, and error-prone. Given this situation and faced with the need to reduce costs, small businesses are looking toward electronic commerce as a possible saviour.

Intra-organizational Transactions :

It is a market-driven transactions driven by dispersing throughout the firm information about its customers and competitors; by spreading strategic and tactical decision making so that all units can participate; and by continuously monitoring their customer commitment by making improved customer satisfaction an ongoing objective. To maintain the relationships that are critical to delivering superior customer value, management must pay close attention to service, both before and after sales. In essence, a market-driven business develops a comprehensive understanding of its customers' business and how customers in the immediate and downstream markets perceive value. 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

Information brokerage and management layer provides service integration through the notion of information brokerages, the development of which is necessitated by the increasing information resource fragmentation. The notion of information brokerage is used to represent an intermediary who provides service integration between customers and information providers, given some constraint such as a low price, fast service, or profit maximization for a client. Information brokers. Tools include software agents, distributed query generator, the distributed transaction generator, and the declarative resource constraint

Base which describes a business's rules and-environment information. Information brokerages dispatch agents capable of information resource gathering, negotiating deals, and performing transactions. The agents are intelligent because they have contingency plans of action.

UNIT IV

Types of Electronic Payment Systems

- Electronic payment systems are proliferating in banking, retail, health care, on-line markets, and even government—in fact, anywhere money needs to change hands.
 - Organizations are motivated by the need to deliver products and services more cost effectively 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 authorize a 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
- 1. 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))
- 2. Credit card-based payments systems
- Encrypted Credit Cards (e.g., World Wide Web form-based encryption)
- Third-party authorization numbers (e.g., First Virtual)

1) Digital Token-Based Electronic Payment Systems

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 that store electronic money.

3. Credit or Postpaid

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

Properties of Electronic Cash:

- There are many ways that exist for implementing an e-cash system, all must incorporate a few common features.

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

1. Monetary value
2. Interoperability
3. Retrievability
4. Security

Electronic Cash in Action

- Electronic Cash is based on cryptographic systems called “digital signatures”.
- This method involves a pair of numeric keys: one for locking (encoding) and the other for unlocking (decoding). (Through public key and private key).

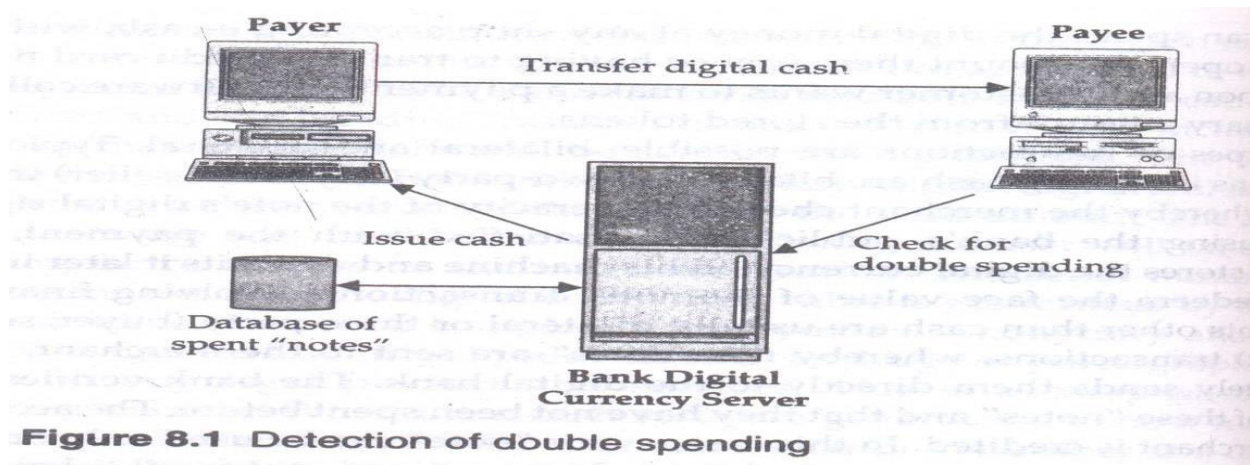
Purchasing E-cash from Currency Servers

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

- Establishment of an account and
 - Maintaining enough money in the account to bank the purchase.
- Some customers might prefer to purchase e-cash with paper currency, either to maintain anonymity 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 digital money undersigned by a bank.
- The users can spend the digital money at any shop accepting e-cash, without having to open an account there or having to transmit credit card numbers.
- As soon as the customer wants to make a payment, the software collects the necessary amount from the stored tokens.



Electronic Checks

- It is another form of electronic tokens.
- In the given model shown in fig, buyers must register with third-party account server before they are able to write electronic checks.
- The account server acts as a billing service.
- The advantages are:
 1. They work in the same way as traditional checks.
 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

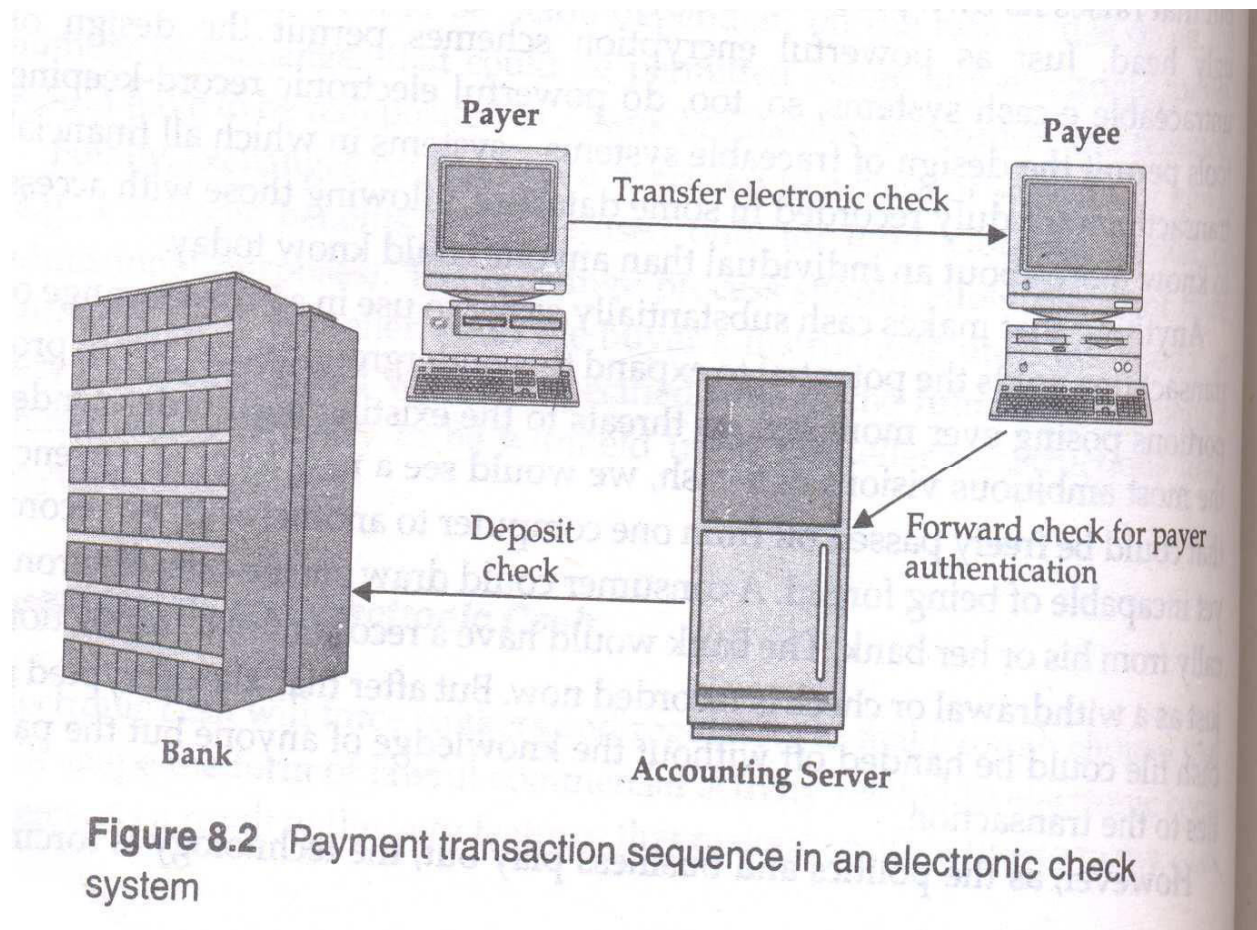


Figure 8.2 Payment transaction sequence in an electronic check system

Smart Cards & Electronic Payment Systems

- Smart cards have been in existence since the early 1980s and hold promise for secure transactions using existing infrastructure.
- Smart cards are credit and debit cards and other card products enhanced with microprocessors 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 loyalty programs.

Smart cards are basically two types:

– Relationship-Based Smart Credit Cards
– Electronic Purses, which replace money, are also known as debit cards and electronic money.

Relationship-Based Smart Credit Cards

– It is an enhancement of existing cards services &/ or the addition of new services that a financial institution delivers to its customers via a chip-based card or other device
– These services include access to multiple financial accounts, value-added marketing programs, or other information card holders may want to store on their card
– It includes access to multiple accounts, such as debit, credit, cash access, bill payment & multiple access options at multiple locations

Electronic Purses

• To replace cash and place a financial instrument are racing to introduce “electronic purses”, wallet-sized smart cards embedded with programmable microchips that store sums of money for people to use instead of cash for everything
• The electronic purse works in the following manner:
1. After purse is loaded with money at an ATM, it can be used to pay for candy in a vending machine with a card reader.

2. It verifies card is authentic & it has enough money, the value is deducted from balance on the card & added to an e-cash & remaining balance is displayed by the vending machine.

2) 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 the user's credit limit.

– Debit cards

- Removes the amount of the charge from the cardholder's account and transfers 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 and

monthly processing fees.

Payment Acceptance and Processing

- Open loop (such as VISA) and closed loop (such as American Express) systems will

accept and process payment cards.

- A merchant bank or acquiring bank is a bank that does business with merchants who

want to accept payment cards.

Software packaged with your electronic commerce software can handle payment card

processing automatically.

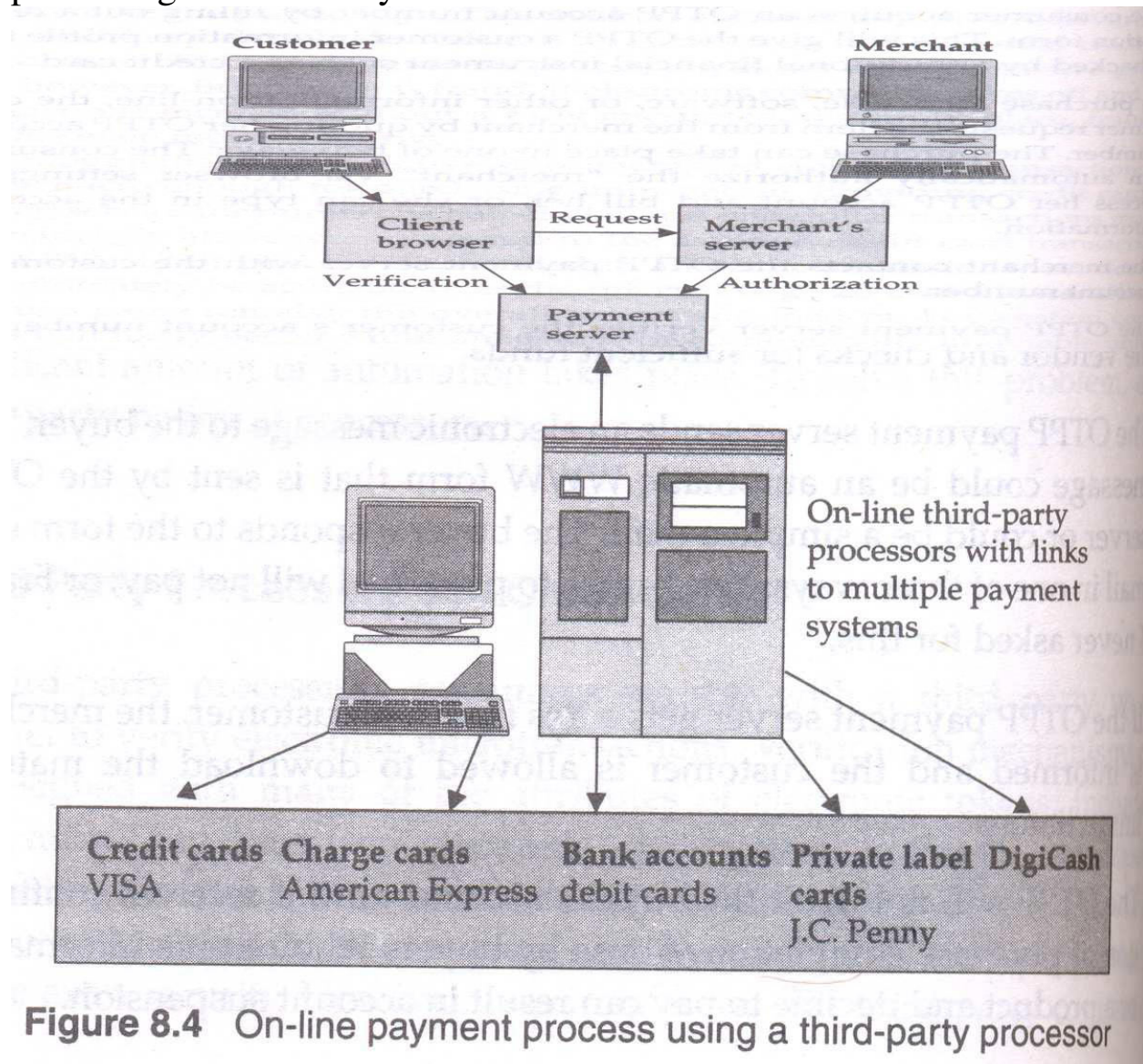


Figure 8.4 On-line payment process using a third-party processor

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

- Concerns about electronic payment methods include:
 - Privacy
 - Security
 - Independence

- Portability
- Convenience

Electronic Cash Issues

- Primary advantage is with purchase of items less than £5
- Credit card transaction fees make small purchases unprofitable
- Facilitates Micropayments – eg for items costing less than £1
- Must be anonymous, just like regular currency
- Safeguards must be in place to prevent counterfeiting
- Must be independent and freely transferable regardless of nationality or storage

Mechanism

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

- Scalability in number of servers and users

Designing Electronic Payment systems

It includes several factors:

- **Privacy.** A user expects to trust in a secure system; just as a telephone is a safe
- **Security.** A secure system verifies the identity of two-party transactions through “user authentication” & reserves flexibility to restrict information/services through access control
- **Intuitive interfaces.** The payment interface must be as easy to use as a telephone.
- **Database integration.** With home banking, for ex, a customer wants to play with all his accounts.
- **Brokers.** A “network banker”-someone to broker goods & services, settle conflicts, & financial transactions electronically-must be in place
- **Pricing.** One fundamental issue is how to price payment system services. For e.g., from cash to bank payments, from paper-based to e-cash. The problem is potential waste of resources.
- **Standards.** Without standards, the welding of different payment users into different networks & different systems is impossible.

Electronic Data Interchange

- Electronic Data Interchange (EDI) - interposes communication of business information in standardized electronic form
- Prior to EDI, business depended on postal and phone systems that restricted communication to those few hours of the workday that overlap between time zones

Why EDI

- Reduction in transaction costs
- Foster closer relationships between trading partners

EDI & Electronic Commerce

- Electronic commerce includes EDI & much more
- EDI forges boundary less relationships by improving interchange of information between trading partners, suppliers, & customers

EDI & Electronic Commerce

- Electronic commerce includes EDI & much more
- EDI forges boundary less relationships by improving interchange of information between trading partners, suppliers, & customers

Benefits of EDI

- Cost & time savings, Speed, Accuracy, Security, System Integration, Just-In-Time Support.
- Reduced paper-based systems, i.e. record maintenance, space, paper, postage costs
- Improved problem resolution & customer service
- Expanded customer/supplier base or suppliers with no EDI program lose business

EDI layered architecture

- Semantic (or application) layer
- Standards translation layer
- Packing (or transport) layer
- Physical network infrastructure layer

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
	World Wide Web	HTTP
Physical layer	Dial-up lines, Internet, I-way	

Figure 9.1 Layered architecture of EDI

EDI semantic layer:

- Describes the business application
- Procurement example
 - Requests for quotes
 - Price quotes
 - Purchase orders
 - Acknowledgments
 - Invoices
- Specific to company & software used

Standards translation:

- Specifies business form structure so that information can be exchanged
- Two competing standards
 - American National Standards Institute(ANSI)X12
 - EDIFACT developed by UN/ECE, Working Party for the Facilitation of International Trade Procedures

EDI transport layer

- How the business form is sent, e.g. post, UPS, fax
- Increasingly, e-mail is the carrier
- Differentiating EDI from e-mail

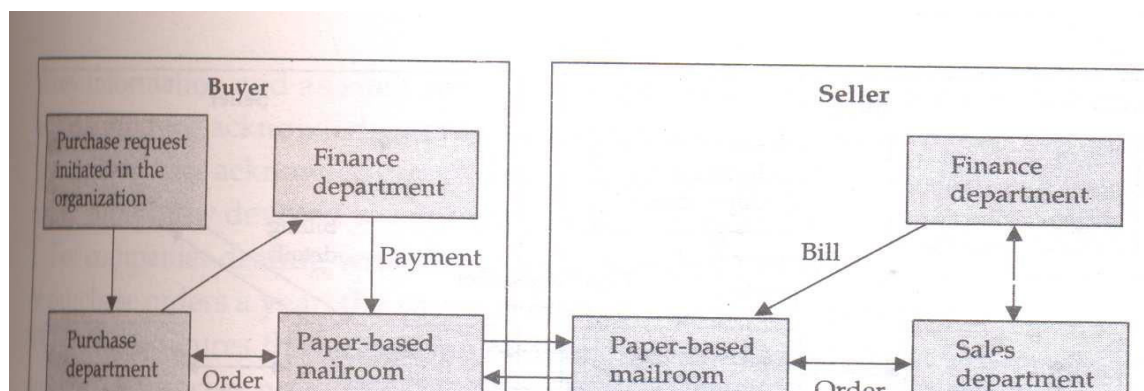
- Emphasis on automation
- EDI has certain legal status

Physical network infrastructure layer

- Dial-up lines, Internet, value-added network, etc.

EDI in Action

- The fig shows the information flow when paper documents are shuffled between organizations via the mailroom



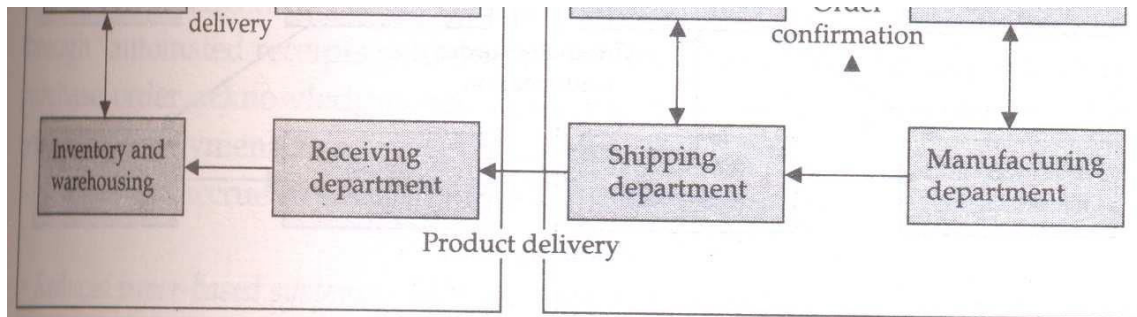


Figure 9.2 Information flow without EDI

- When the buyer sends a purchase order, then relevant data extracted & recorded on a hard copy.
- This hard copy is forwarded to several steps, at last manually entered into system by the data entry operators
- This process is somewhat overhead in labor costs & time delays.

EDI in Action

- Information flow with EDI are as follows:
 1. Buyer sends purchase order to seller computer
 2. Seller sends purchase order confirmation to buyer
 3. Seller sends booking request to transport company
 4. Transport company sends booking confirmation to seller
 5. Seller sends advance ship notice to buyer
 6. Transport company sends status to seller
 7. Buyer sends Receipt advice to seller
 8. Seller sends invoice to buyer
 9. Buyer sends payment to seller
 10. EDI as a fast, inexpensive & safe method

Benefits of EDI

- Cost & time savings, Speed, Accuracy, Security, System Integration, Just-In-Time Support.
- Reduced paper-based systems, i.e. record maintenance, space, paper, postage costs

- Improved problem resolution & customer service
- Expanded customer/supplier base or suppliers with no EDI program lose business

EDI Applications in Business

Four different scenarios in industries that use EDI extensively:

1. International or cross-border trade
2. Electronic funds transfer
3. Health care EDI for insurance claims processing
4. Manufacturing & retail procurement

. International or cross-border trade

- EDI has always been very closely linked with international trade.
- Trade efficiency, which allows faster, simpler, broader & less costly transactions

UNIT V

Advertising on the internet:

Advertisement through web has become a widely accepted medium of advertisement. Many agencies have created the sites for advertising. Competing with the periodicals, these agencies are actively engaged in providing advertisement assistance to various products and services. The www technology has developed significantly and the users get more time to spend on these web sites. Access fee is usually reduced to new users. The cost of access is also shared by the providers of advertisement whenever users access online yellow pages the advertisers pay for the access time.

Marketing on the internet:

Marketing is the process, which starts and ends with consumer. It is the prime part of business activity. Consumer needs are to be identified first and then process is to be started.

Marketing requires planning, organizing, control and proper leadership. Selling focuses on volume where as marketing focuses on consumer. Advertising is the process of reaching the consumer through a media.

Information Filtering:

Information filtering is one of the important goals of E-Commerce. It has the aim to select all and only that information is relevant to the relevant set. It focuses on providing efficient access to the changing information for a specific work. In this case, the access is controlled through various software filters. The filters only allow relevant information for taking decisions.

Charting the Online Marketing Process:

Online marketing is not very simple. It is highly complex. For creating an online marketing process, some important points are to be considered.

- i) The process of advertising to be followed;
- ii) Type of electronic material to be created;
- iii) Segmenting the population of potential customers for database;
- iv) Method of using database of consumers;
- v) The primary goal is to design a marketing campaign for cost saving and increasing revenue;
- vi) Now the importance is for information and then for technology. Now the product model has changed and need model have emerged;
- vii) Providing valuable services to consumers through FAQ;
- viii) Identifying Target customers and providing new products and services.

Web browser:

Web browser is software that provides a friendly interface on the web. It display the web page and moves between the sites. Examples of WEB browsers: MOSAICA, Netscape Navigator, internet Explorer, Google Chrome and Mozilla Firefox etc.

Digital Copyright:

Shrimati Indira Gandhi College, Tiruchirappalli-2

The emergence of new digital information technologies, such as the Internet, is having a significant impact on copyright and related rights, and the copyright industries such as music, film and software throughout the world.

On-demand training:

These high-definition video lectures are recorded in a professional studio, and include 24-hour access to our remote hands-on labs, which you can use to practice as you learn. Cisco Training on Demand courses strive to provide an engaging, interactive learning experience.

software agent:

Software agent is a computer program that acts for a user or other program in a relationship of agency, which derives from the Latin agere (to do): an agreement to act on one's behalf.

Computer-based training:

Computer-based training (CBT) is any course of instruction whose primary means of delivery is a computer. A CBT course (sometimes called courseware) may be delivered via a software product installed on a single computer, through a corporate or educational intranet, or over the Internet as Web-based training.

Software Agent Characteristics:

Reactivity (agents perceive the context in which they operate and react to it appropriately).

- Distinguishing agents from programs.

- Intuitive distinguishing agents from objects.
- Distinguishing agents from expert systems.
- Distinguishing intelligent software agents from intelligent agents in AI.
- Organizational impact.